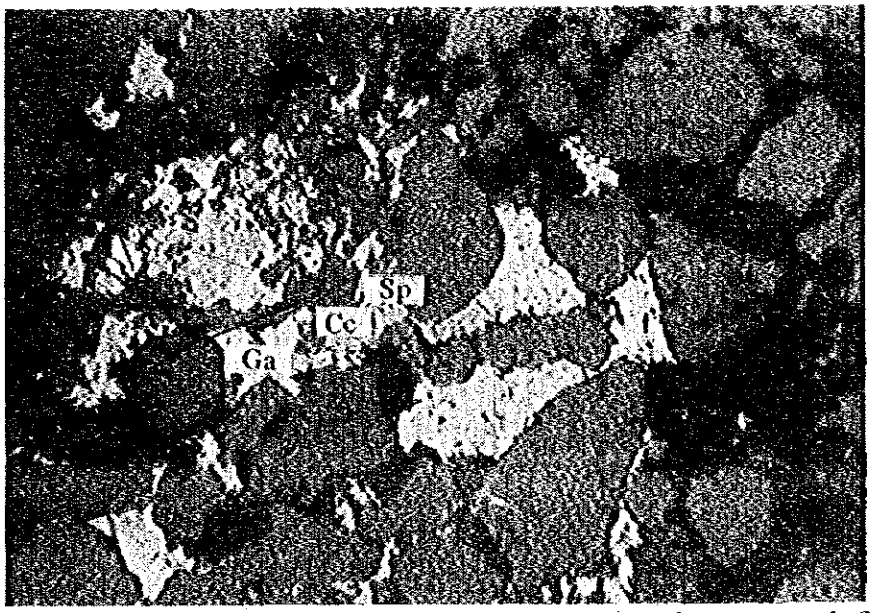
1.



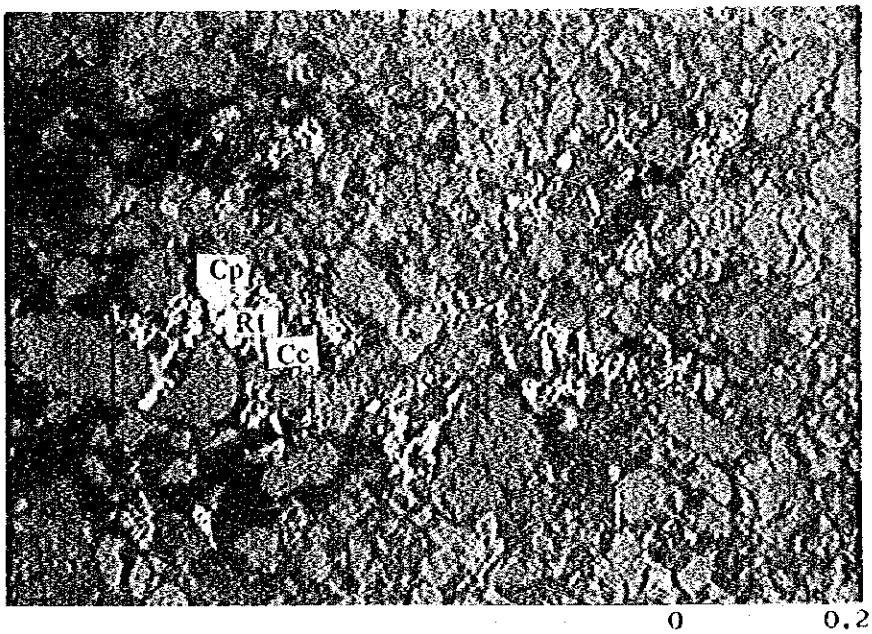
0 0.2 mm

Sample No.: MR-1-1075

Rock name : Siltstone

(P-T Red Sandstone Formation)

2.



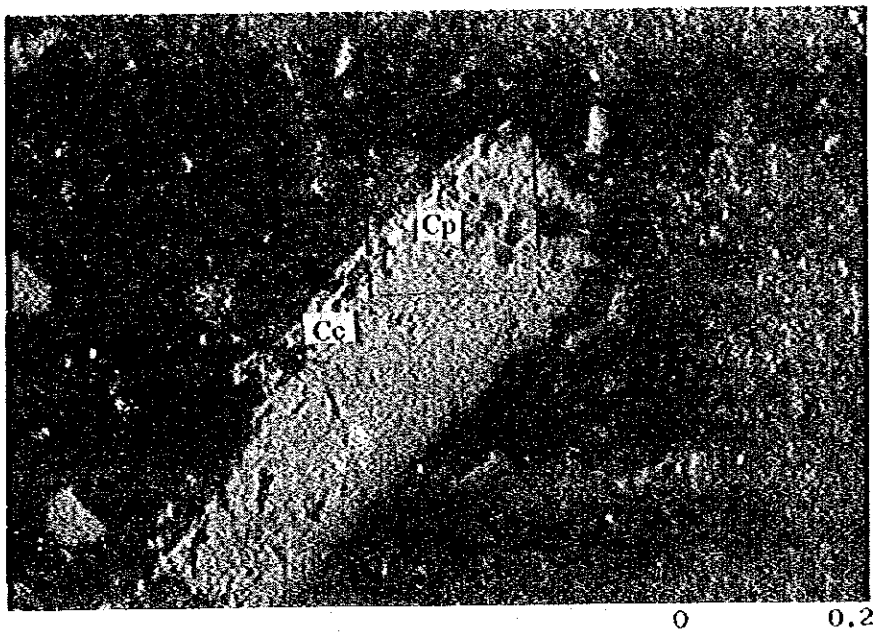
0 0.2 mm

Sample No.: MR-1-1132

Rock name : Siltstone

(P-T Red Sandstone Formation)

3.



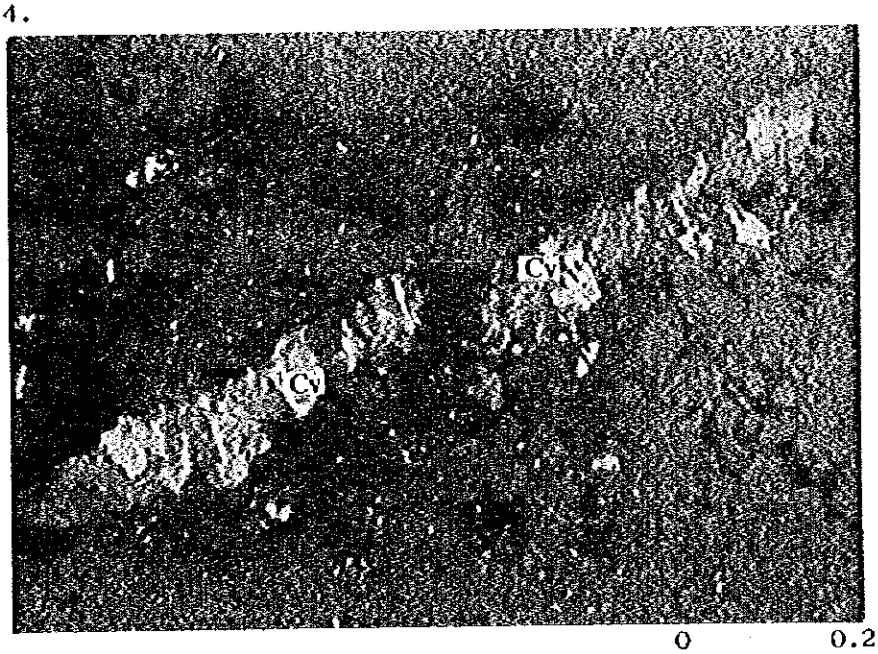
0 0.2 mm

Sample No.: MR-1-1145

Rock name : Granite

(Basement)

4.



0 0.2 mm

Sample No.: MR-2-2221

Rock name : Siltstone

(P-T Red Sandstone Formation)

Fig. III—8 Photomicrographs of X-ray Microanalysis

Abbreviation

Ba : Barite

Be : Bequerelite

Ca : Carnotite

Ce : Cerussite

Co : Co-Mn mineral

Fe : Fervanite

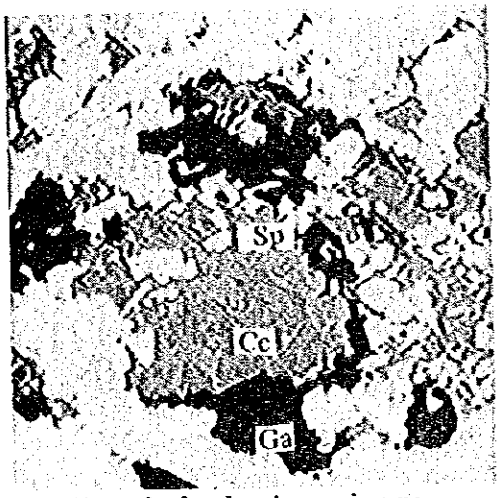
Fl : Fluorite

Ga : Galena

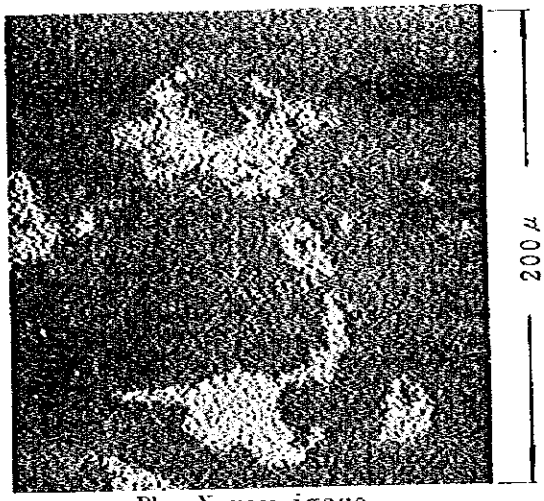
He : Hematite

U : Uraninite or Pitchblende

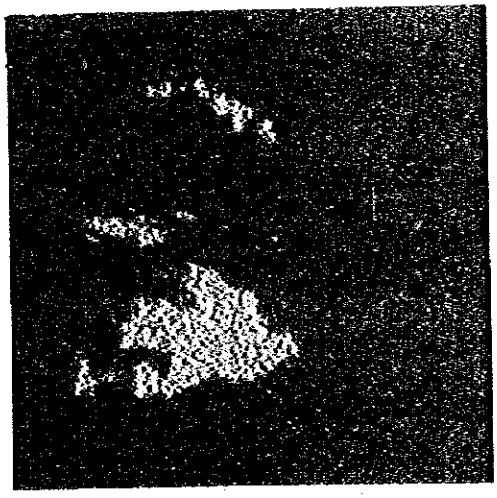
1.



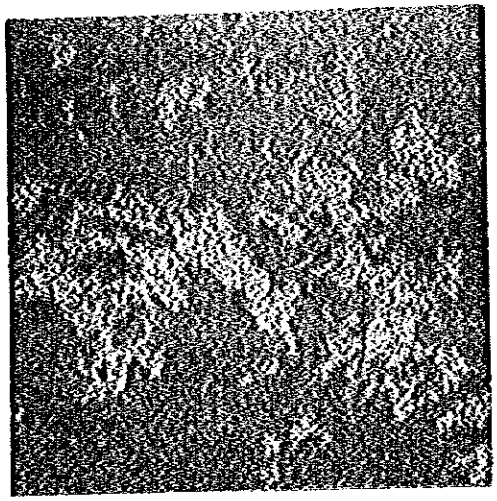
Absorbed electron image



Pb X-ray image



Cu X-ray image



Zn X-ray image

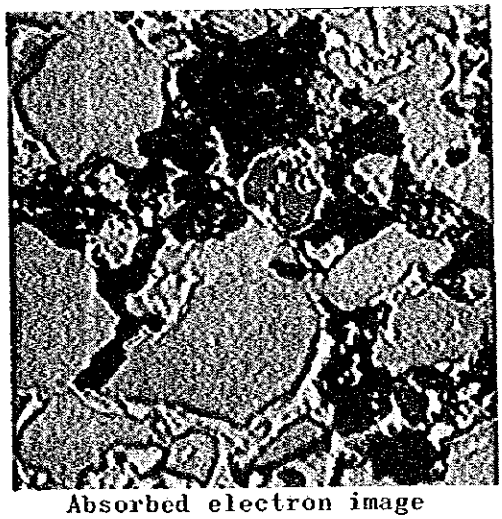
Sample No. : MR-1-1075

Accelerating Voltage : 25 KV

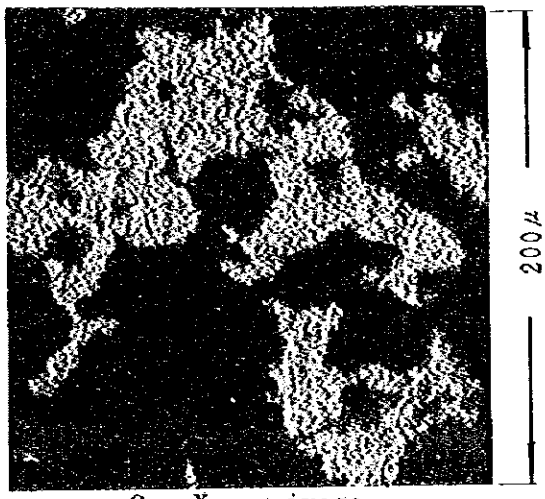
Absorbed Electron Current: 0.2 μA

Magnification : x300

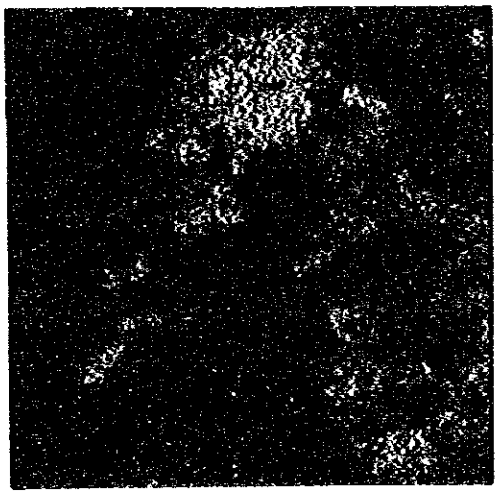
2.



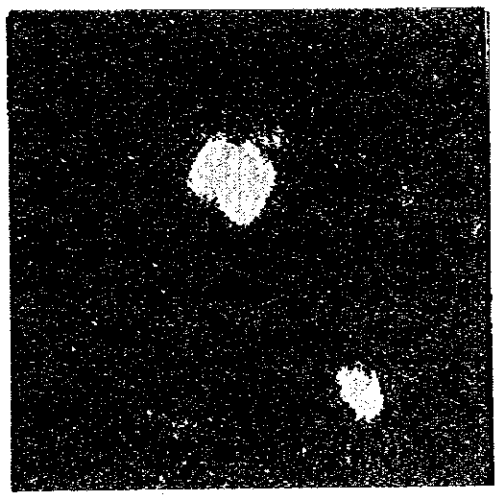
Absorbed electron image



Cu X-ray image



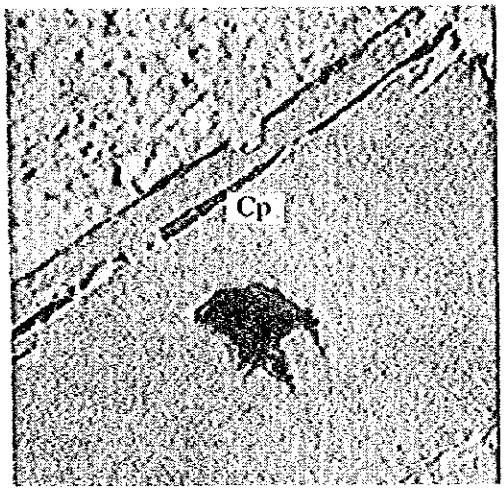
Fe X-ray image



Ti X-ray image

Sample No.	:	MR-1-1132
Accelerating Voltage	:	25 KV
Absorbed Electron Current	:	0.2 μA
Magnification	:	x300

3.



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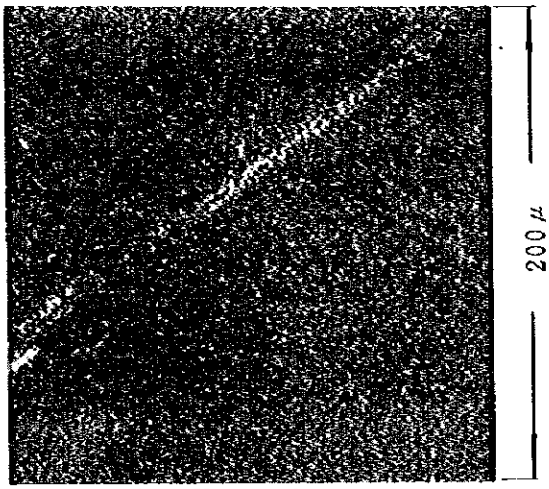
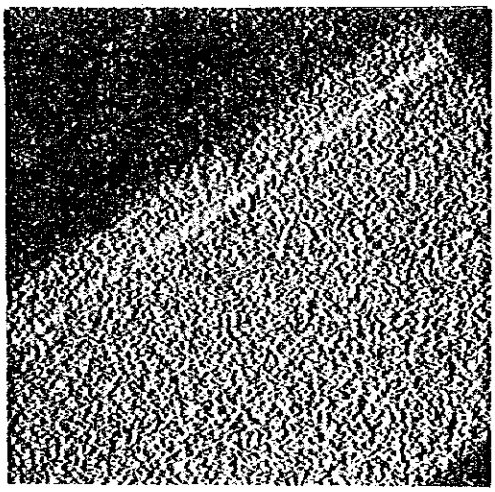
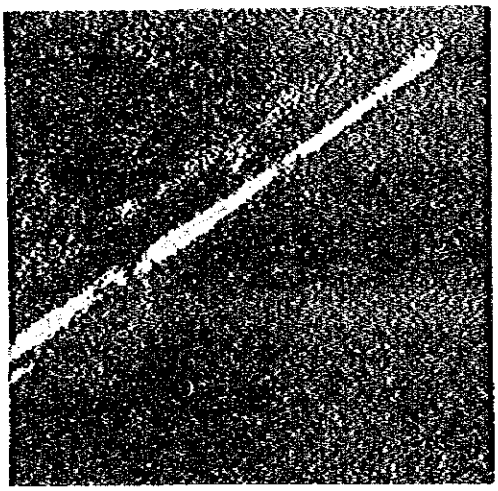


Cu. X-ray image



Fe X-ray image

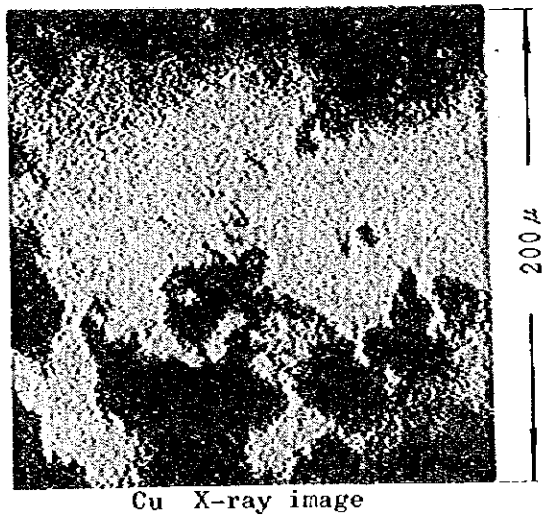


S X-ray image

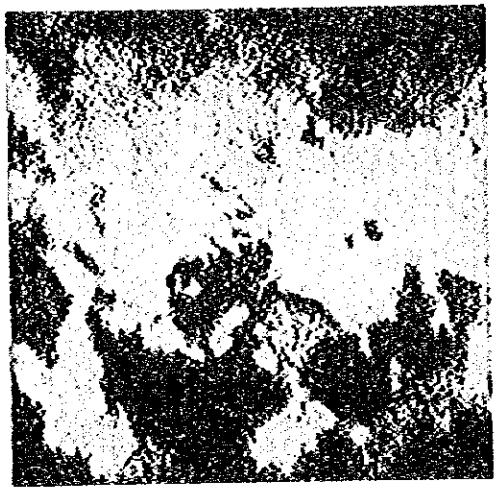
Sample No.	:	MR-1-1145
Accelerating Voltage	:	25 KV
Absorbed Electron Current:		0.2 μA
Magnification	:	x300

4.

Absorbed electron image



Cu X-ray image



S X-ray image

Sample No. : MR-2-2221

Accelerating Voltage : 25 KV

Absorbed Electron Current: 0.2 μA

Magnification : x300

Table III—1 Drilling Machine and Materials

(Drilling Machine: Craelius D-1000)

(1)

Item	Model	Quantity	Capacity, Type and Specification
Drilling machine	Cralieus D-1000	1	Capacity: BQ 650 m
Engine for drill	F4L-912	1	Diesel engine 2,150 rpm/52 PS
Pump	Longyear 314	1	Capacity 53 ℓ/min Pressure 21 ~ 35 kg/cm^2
Engine for pump	F2L-411D	1	Diesel engine 2,200 rpm/18 PS
Pump	Richer P438	1	
Engine for pump	Bernard Type 110	1	
Derrick		1	Steel structual derrick lifting 6 m height
Drill rods	HQ	24	3.00 m/pc
	HQ	2	1.50 m/pc
	NQ	56	3.00 m/pc
	NQ	4	1.50 m/pc
	BQ	90	3.00 m/pc
	BQ	2	1.50 m/pc
Casing pipes	HW	2	3.00 m/pc
	HW	1	1.50 m/pc
	HW	1	0.50 m/pc
	NW	85	3.00 m/pc
	NW	6	1.50 m/pc
	NW	4	0.50 m/pc
	BW	86	3.00 m/pc
	BW	6	1.50 m/pc
	BW	4	0.50 m/pc

(Materials)

(2)

Description	Specification	Unit	Quantity				
			MR-1	MR-2	MR-3	MR-4	Total
Light oil		ℓ	1,400	3,620	1,440	950	7,410
Mobil oil		ℓ	30	295	198	33	556
Hydraulic oil		ℓ	10	60	20	10	100
Grease		kg	10	25	10	5	50
Bentonite		Bag	56	107	48	35	246
CMC		kg	13.4	17.0	9.0	6.0	45.4
Cement		Bag	6	10	20	12	48
Single core tube	114mm x 0.5m	Set	1				1
Wire line core barrel	HQ x 3.00m	Set	1				1
"	NQ x 3.00m	Set	1				1
"	BQ x 3.00m	Set	1				1
Casing metal shoe	HW	Pcs	1		1		2
"	NW	Pcs	1	1	1	1	4
"	BW	Pcs		1			1
Core lifter	HQ	Pcs	2	1		1	4
"	NQ	Pcs	1	1		1	3
"	BQ	Pcs		1			1
Core lifter case	HQ	Pcs	1				1
"	NQ	Pcs	1		1		2
"	BQ	Pcs	1	1			2
Bearings (bigger)	HQ	Pcs	1		1		2
" (")	NQ	Pcs	1	1	1		3
" (")	BQ	Pcs		2			2
" (smaller)	HQ	Pcs	1	1	1		3
" (")	NQ	Pcs	1	1	1	1	4
" (")	BQ	Pcs		2			2
Spring roll pin	HQ	Set		1			1
"	NQ	Set	1				1
"	BQ	Set		1			1
Core box	116, HQ	Pcs	11	9	6	8	34
"	NQ, BQ	Pcs	11	30	12	4	57
Guide pipe	HQ	Pcs		1			1
"	NQ	Pcs	1		1		2
"	BQ	Pcs		1			1
Guide coupling	HQ	Pcs	1				1
"	NQ	Pcs		1			1
"	BQ	Pcs		1			1
Suction hose	50mm x 4.5m	Pcs	1				1
Pump packing		Pcs	8		8		16
Valve steel ball		Pcs		8			8
Piston rod		Pcs		2			2
Water swivel packing		Pcs	3	3	3	3	12
V-belt		Set	1				1
Wire	#10	kg	8	10	5	5	28
"	#12	kg	6	3	4	4	17
Nail		kg	3	4	6	3	16

(Materials)

(3)

Description	Specification	Unit	Quantity				
			MR-1	MR-2	MR-3	MR-4	Total
Rag		kg	5	10	5	3	23
Diamond bit	HQ	Pcs	3	2	1	1	7
"	NQ	Pcs	3	3	3	2	11
"	BQ	Pcs		3			3
Diamond reamer	HQ	Pcs	1		1		2
"	NQ	Pcs	1	1	1		3
"	BQ	Pcs		1			1
Metal crown	116mm	Pcs	1	1	1	1	4
Wire rope	6mm x 300m	Roll	1				1
"	12mm x 40m	Roll	1				1

Table III—2 Preparation and Removal

Item \ Hole No.		MR-1		MR-2		MR-3		MR-4	
Preparation and removal	In	14th MAY '79		27th MAY '79		20th JUNE '79		5th JULY '79	
		17th MYA '79		29th MAY '79		22nd JUNE '79		7th JULY '79	
	Out	26th MAY '79		19th JUNE '79		30th JUNE '79		-	
		27th MAY '79		20th JUNE '79		1st JULY '79		-	
		Days	Man-shifts	Days	Man-shifts	Days	Man-shifts	Days	Man-shifts
Preparation	Access road	1	1	1	1	1	1	1	1
	Haulage	0.5	0.5	0.5	0.5	0.5	1	0.5	1
	Installation	1.25	1.25	1.5	1.5	1.5	2	1.5	2
	Water pipe	0.25	0.25						
	Test run, etc.								
	Total	3	3	3	3	3	4	3	4
Removal	Dismounting	1	1	1	1	1	1		
	Pipe removal	1	1	1	3	1	1		
	Haulage								
	Road rein-statement								
	Others								
	Total	2	2	2	4	2	2	-	-
Grand Total		5	5	5	7	5	6	3	4

Table III--3 Operational Results of Drill Hole, MR-1

Working Period

	Period	Number of Days	Actual Working Days	Day Off	Total Number of Workers
Preparation	14th MAY 1979 ~ 17th MAY 1979	4	4	-	147
Drilling	18th MAY 1979 ~ 26th MAY 1979	9	9	-	218
Removing	26th MAY 1979 ~ 27th MAY 1979	2	2	-	21
Total	14th MAY 1979 ~ 27th MAY 1979	14	14	-	386

Drilling Length

Planned Length	148 m	Over-burden	0.50 m
Increase or Decrease in Length	0.3 m	Core Length	126.20 m
Length Drilled	148.30 m	Core Recovery	85.1 %

Core Recovery for each 100 m section

Depth of Hole	Section	Total
0 ~ 99.70m	78.4 %	78.4 %
99.70~148.30m	98.8 %	85.1 %
m	%	%
m	%	%
m	%	%
m	%	%

Working Time

Drilling	49°00'	21.3 %	19.0 %
Hoisting & Lowering Rod	30°00'	13.0 %	11.6 %
Hoisting & Lowering I.T.	61°30'	26.7 %	23.8 %
Miscellaneous	48°30'	21.1 %	18.8 %
Repairing	16°00'	7.0 %	6.2 %
Others	25°00'	10.9 %	9.7 %
Sub Total	230°00'	100.0 %	89.1 %
Removing: Preparation	18°00'		7.0 %
Removing: Moving	10°00'		3.9 %
Grand Total	258°00'		100 %

Efficiency of Drilling

148.30 m/Working Period	10.6 m/day
148.30 m/Working Days	10.6 m/day
148.30 m/Drilling Period	10.6 m/day
148.30 m/Net Drilling Days	16.5 m/day
Total workers/ 148.30 m	2.60 Man/m
Total Drilling Workers/ 148.30 m	1.47 Man/m

Casing Pipe Inserted

Pipe Size & Meterage	Inserted Length (%) / Drilling Length	Recovery of Casing Pipe
HW 4.6 m	3.1 %	100 %
NW 70.0 m	47.2 %	100 %
BW m	%	%

Remarks

I.T.: Inner Tube

Table III—4 Operational Results of Drill Hole, MR-2

Working Period

	Period	Number of Days	Actual Working Days	Day Off	Total Number of Workers
Preparation	27th MAY 1979 ~ 29th MAY 1979	3	3	-	82
Drilling	30th MAY 1979 ~ 18th JUNE 1979	20	20	-	431
Removing	19th JUNE 1979 ~ 20th JUNE 1979	2	2	-	32
Total	27th MAY 1979 ~ 20th JUNE 1979	25	25	-	545

Drilling Length

Planned Length	265 m	Over-burden	0 m
Increase or Decrease in Length	0.95 m	Core Length	248.15 m
Length Drilled	265.95 m	Core Recovery	93.3 %

Working Time

Drilling	89°00'	17.4 %	16.4 %
Hoisting & Lowering Rod	54°00'	10.5 %	9.9 %
Hoisting & Lowering I.T.	73°30'	14.4 %	13.5 %
Miscellaneous	195°30'	38.2 %	35.9 %
Repairing	90°00'	17.6 %	16.6 %
Others	10°00'	1.9 %	1.8 %
Sub Total	512°00'	100 %	94.1 %
Removing: Preparation	14°00'		2.6 %
Removing: Moving	18°00'		3.3 %
Grand Total	544°00'		100 %

Core Recovery for each 100 m section

Depth of Hole	Section	Total
0 ~ 99.60m	84.6 %	84.6 %
99.60 ~200.20m	99.2 %	91.9 %
200.20~265.95m	97.6 %	93.3 %
m	%	%
m	%	%
m	%	%

Efficiency of Drilling

265.95 m/Working Period	10.64 m/day
265.95 m/Working Days	10.64 m/day
265.95 m/Drilling Period	13.30 m/day
265.95 m/Net Drilling Days	13.30 m/day
Total workers/ 265.95 m	2.05 Man/m
Total Drilling Workers/ 265.95 m	1.62 Man/m

Casing Pipe Inserted

Pipe Size & Meterage	Inserted Length (%) / Drilling Length	Recovery of Casing Pipe
HW 2.0 m	0.8 %	100 %
NW 261.0 m	98.1 %	100 %
BW 26.5 m	99.6 %	100 %

Remarks

I.T.: Inner Tube

Table III—5 Operational Results of Drill Hole, MR-3

Working Period

	Period	Number of Days	Actual Working Days	Day Off	Total Number of Workers
Preparation	20th JUNE 1979 ~ 22nd JUNE 1979	3	3	-	67
Drilling	22nd JUNE 1979 ~ 30th JUNE 1979	9	9	-	181
Removing	30th JUNE 1979 ~ 1st JULY 1979	2	2	-	30
Total	20th JUNE 1979 ~ 1st JULY 1979	12	12	-	278

Drilling Length

Planned Length	136 m	Over-burden	0 m
Increase or Decrease in Length	2.00 m	Core Length	114.10 m
Length Drilled	138.00 m	Core Recovery	82.7 %

Working Time

Drilling	42°00'	19.7 %	17.2 %
Hoisting & Lowering Rod	32°00'	15.0 %	13.1 %
Hoisting & Lowering I.T.	54°30'	25.6 %	22.3 %
Miscellaneous	57°30'	27.0 %	23.6 %
Repairing	17°00'	8.0 %	7.0 %
Others	10°00'	4.7 %	4.1 %
Sub Total	213°00'	100 %	87.3 %
Removing — Preparation	13°00'		5.3 %
Removing — Moving	18°00'		7.4 %
Grand Total	244°00'		100 %

Casing Pipe Inserted

Pipe Size & Meterage	Inserted Length (%) / Drilling Length	Recovery of Casing Pipe
BW 3.7 m	2.7 %	100 %
NW 33 m	23.9 %	100 %
BW m	%	%

Core Recovery for each 100 m section

Depth of Hole	Section	Total
0~99.15 m	85.6 %	85.6 %
99.15~138.00m	75.3 %	82.7 %
m	%	%
m	%	%
m	%	%
m	%	%

Efficiency of Drilling

138.00 m/Working Period	11.50 m/day
138.00 m/Working Days	11.50 m/day
138.00 m/Drilling Period	15.33 m/day
138.00 m/Net Drilling Days	15.33 m/day
Total workers/ 138.00 m	2.01 Man/m
Total Drilling Workers/ 138.00 m	1.31 Man/m

Remarks

I.T.: Inner Tube

Table III—6 Operational Results of Drill Hole, MR-4

Working Period

	Period	Number of Days	Actual Working Days	Day Off	Total Number of Workers
Preparation	2nd JULY 1979 ~ 7th JULY 1979	6	6	-	147
Drilling	8th JULY 1979 ~ 12th JULY 1979	5	5	-	110
Removing	-	-	-	-	-
Total	2nd JULY 1979 ~ 12th JULY 1979	11	11	-	257

Drilling Length

Planned Length	100 m	Over-burden	4.00 m
Increase or Decrease in Length	0.10 m	Core Length	63.40 m
Length Drilled	100.10 m	Core Recovery	63.3 %

Core Recovery for each 100 m section

Depth of Hole	Section	Total
0 ~ 100.10m	63.3 %	63.3 %
m	%	%
m	%	%
m	%	%
m	%	%
m	%	%

Working Time

Drilling		37°00'	22.7 %	19.9 %
Hoisting & Lowering Rod		25°30'	15.7 %	13.7 %
Hoisting & Lowering I.T.		32°00'	19.6 %	17.2 %
Miscellaneous		24°30'	15.0 %	13.2 %
Repairing		4°00'	2.5 %	2.1 %
Others		40°00'	24.5 %	21.5 %
Sub Total		163°00'	100 %	87.6 %
Removing	Preparation	18°00'		9.7 %
Removing	Moving	5°00'		2.7 %
Grand Total		186°00'		100 %

Efficiency of Drilling

100.10 m/Working Period	9.10 m/day
100.10 m/Working Days	9.10 m/day
100.10 m/Drilling Period	20.02 m/day
100.10 m/Net Drilling Days	20.02 m/day
Total workers/ 100.10 m	2.57 Man/m
Total Drilling Workers/ 100.10 m	1.10 Man/m

Casing Pipe Inserted

Pipe Size & Meterage	Inserted Length (%) Drilling Length	Recovery of Casing Pipe
HW 3.6 m	3.6 %	100 %
NW 54 m	53.9 %	100 %
BW m	%	%

Remarks

I.T.: Inner Tube

Table III—7 Summary Operational Data for Drill Holes

Drill hole No.	Type of machine	Drilling period	Drilling length	Core		No. of drilling shift			Drilling speed		Remarks
				Length	Recovery	Drilling	Casing etc.	Total	* m/shift	** m/shift	
			m	m	%						
MR-1	Craelius D-1000	18th MAY 1979 ~ 26th MAY 1979	148.30	126.20	85.1	24	2	26	6.18	5.70	
MR-2	"	30th MAY 1979 ~ 18th JUNE 1979	265.95	248.15	93.3	34	26	60	7.82	4.43	
MR-3	"	22nd JUNE 1979 ~ 30th JUNE 1979	138.00	114.10	82.7	23	1	24	6.00	5.75	
MR-4	"	8th JULY 1979 ~ 12th JULY 1979	100.10	63.40	63.3	15	-	15	6.67	6.67	
Total			652.35	551.85	84.6	96	29	125	6.80	5.22	

* Drilled per one shift covering net drilling operations.
** Drilled per one shift covering total works conducted.

Table III—8 Working Time for Drill Holes

Drill hole No.	Drilling	Hoisting & lowering rod & I.T.		Miscellaneous			Repairs	Others	Moving operation	Total
		Rod	Inner tube	Casing insertion	Hole reaming	Others				
MR-1	49°00'	30°00'	61°30'	10°00'	-	38°30'	16°00'	25°00'	28°00'	
MR-2	89°00'	54°00'	73°30'	36°30'	99°00'	60°00'	90°00'	10°00'	32°00'	
MR-3	42°00'	32°00'	54°30'	8°00'	-	49°30'	17°00'	10°00'	31°00'	
MR-4	37°00'	25°30'	32°00'	2°30'	-	22°00'	4°00'	40°00'	23°00'	
Total	217	141°30'	221°30'	57°00'	99°00'	170°00'	127°00'	85°00'	114°00'	1,232°00'
		363°00'			326°00'					

Table III—9 Drilling Meterage of Diamond Bits

Item	Size	Type	Drilling meterage by drill hole (meter)				Total
			MR-1	MR-2	MR-3	MR-4	
Bit	HQ	HQ-WL	36.15				36.15
			21.30				21.30
			8.20	15.10			23.30
				31.35			31.35
				6.45	24.70		31.15
					5.00	31.60	36.60
						19.70	19.70
Total			65.65	52.90	29.70	51.30	199.55
Bit	NQ	NQ-WL	29.45				29.45
			32.70				32.70
			15.90	6.30			22.20
				38.40			38.40
				36.70			36.70
				25.35	19.10		44.45
					19.60		19.60
					27.05		27.05
					38.85		38.85
						20.70	20.70
						24.50	24.50
Total			78.50	106.75	104.60	45.20	334.60
Bit	BQ	BQ-WL		38.55			38.55
				26.30			26.30
				39.45			39.45
Total				104.30			104.30

Table III—10 List of Rock Samples

Sample No.	Location			Rock Name	XMA	T.S.	P.S.	Chemical Analysis				Depth
	X	Y	Altitude					Pb	Ba	U	Th	
MR-1-1030	550.0	257.0	1,440	mudstone						○		30.00 m - 31.00 m
1047				do						○		47.00 - 48.00
1048				do						○		48.00 - 48.60
1055				do						○		55.60 - 56.60
1056				do						○		56.60 - 57.50
1057				do						○		57.50 - 59.00
1061				do						○		61.60 - 62.60
1062				do						○		62.60 - 63.60
1074				do						○		74.60 - 75.20
1075				do	○	○	○			○		75.20 - 75.60
1076				do						○		75.60 - 76.60
1115				do						○		115.50 - 116.30
1116				do		○				○		116.30 - 117.30
1117				do						○		117.30 - 118.30
1118				do						○		118.30 - 119.30
1132				do	○	○	○			○		132.50 - 132.80
1133				do						○		133.10 - 133.30
1138				do						○		138.00 - 139.00
1139				do						○		139.00 - 140.00
1140				do				○	○	○		140.00 - 141.00
1141				do				○	○	○		141.00 - 142.00
1142				do				○	○	○		142.00 - 143.00
1143				do				○	○	○		143.00 - 144.00
1144				arkose sandstone		○		○	○	○		144.00 - 145.00
1145				granite	○	○	○	○	○	○		145.00 - 146.00
1148				granite		○						148.00

XMA : X-ray Microanalysis
T.S. : Thin Section
P.S. : Polished Section

Sample No.	Location			Rock Name	XMA	T.S.	P.S.	Chemical Analysis				Depth
	X	Y	Altitude					Pb	Ba	U	Th	
MR-2-2160	540.0	257.0	1,545	siltstone						○		160.00 - 170.10
2167				do				○		○		167.00 - 168.00
2169				do				○		○		169.00 - 170.00
2170				do				○		○		170.00 - 171.60
2221				mudstone		○	○			○		221.00 - 221.20
2230				siltstone						○		230.00 - 231.00
2231				mudstone		○				○		231.00 - 232.50
2242				do						○		242.60 - 243.60
2243				siltstone						○		243.60 - 244.60
2244				do						○		244.60 - 245.60
2245				do						○		245.60 - 246.60
2246				do						○		246.60 - 247.60
2247				do						○		247.60 - 248.00
2248				do						○		248.00 - 249.00
2249				do						○		249.00 - 250.00
2250				do						○		250.00 - 251.00
2251				arkose sandstone						○		251.00 - 252.00
2252				mudstone						○		252.00 - 253.00
2253				arkose sandstone						○		253.00 - 254.00
2254				do						○		254.00 - 255.00
2255				do						○		255.00 - 256.00
2256				do						○		256.00 - 257.00
2257				do						○		257.00 - 258.00
2258				sandstone						○		258.00 - 259.00
2259				arkose sandstone				○	○	○		259.00 - 260.00
2260				do				○	○	○		260.00 - 261.00
2261				do		○		○	○	○		261.00 - 262.00
2262				do				○	○	○		262.00 - 263.00
2263				do	○	○	○	○	○	○		263.00 - 264.00
2264				aplific granite		○		○	○	○		264.00 - 265.20
MR-3-3131	540.0	237.0	1,543	siltstone				○		○		131.10 - 132.10
3132				do				○		○		132.10 - 133.10

Sample No.	Location			Rock Name	XMA	T.S.	P.S.	Chemical Analysis				Depth	
	X	Y	Altitude					Pb	Ba	U.	Th		
MR-3-3133	540.0	237.0	1,543	siltstone				O		O		133.10	- 134.10
3134				do				O		O		134.10	- 135.10
3135				do				O		O		135.10	- 136.60
HM-3-3362	513.9	244.3	1,848					O	O			362.00	- 363.00
3364								O	O			364.00	- 365.00
3366								O	O			366.00	- 367.00
3368								O	O			368.00	- 369.00
3370								O	O			370.00	- 371.00
3372								O	O			372.00	- 373.00
3374								O	O			374.00	- 375.00
3376								O	O			376.00	- 377.00
3378								O	O			378.00	- 379.00
3380								O	O			380.00	- 381.00
3382								O	O			382.00	- 383.00
3384								O	O			384.00	- 385.00
3386								O	O			386.00	- 387.00
3388								O	O			388.00	- 389.00
3390								O	O			390.00	- 391.00
3392								O	O			392.00	- 393.00
3394								O	O			394.00	- 395.00
3396												396.00	- 397.00
HM-5-5289	535.12	252.3	1,585	siltstone								289.00	- 290.00
5307				cparse graomed samdstpme				O	O			307.00	- 308.00
5308				arkose sandstone				O	O			308.00	- 309.00
5309				do				O	O			309.00	- 310.00
5310				arkose sandstone				O	O	O		310.00	- 311.00
5311				do				O	O	O		311.00	- 312.00
5312				do				O	O	O		312.00	- 313.00
5313				do				O	O	O		313.00	- 314.00
5314				do				O	O	O		314.00	- 315.00
5315				aplitic granite(carapace)								315.00	- 316.00
5316				aplitic granite								316.00	- 317.00

Table III—11 Microscopic Observations of Thin Sections

Sample No.	Locality	Formation	Rock Name	Microscopic Observation	Remarks
MR-1 -1075	MR-1 75m.50	P - T	Siltstone	The rock shows clastic texture and composed of quartz, orthoclase and plagioclase. All of the fragments are rounded and about 0.15mm in size. Quartz is most aboundant and shows wavy extinction. Feldspars show twinning and sericitic alteration. Matrix is mainly made of recrystallized carbonates and fine felsic minerals (0.05mm in size). Other matrix minerals are opaque minerals, a few amount of epidote and glass.	Photo-micrograph: Fig. III-6 No. 1
MR-1 -1116	MR-1 116m.50	P - T	Siltstone	The rock also shows clastic texture and composed of quartz, orthoclase and plagioclase. The fragments show mostly irregular in form and not so good sorting (1.0mm ~ 0.1mm in size). Quartz is most aboundant and shows wavy extinction. Feldspars show twinning and are affected by weak alteration. Matrix is as nearly same as the above. Glassy part is a little wider than the above sample No. MOR-1-1075.	

Sample No.	Locality	Formation	Rock Name	Microscopic Observation	Remarks
MR-1 1132	MR-1 132.40	P - T	Siltstone	This has also clastic texture is composed of quartz, orthoclase and plagioclase. Amount of fragments is minor than the above mentioned samples. The fragments are mostly rounded in form and their sizes are various from 0.7mm to 0.05mm. Matrix is composed of brownish iron oxide (hematite) carbonates, fine grained felsic and glass.	
MR-1 -1144	MR-1 144.50	P - T	Arkose sandstone	The rock shows clastic texture and is composed of quartz, orthoclase, plagioclase and granite fragments. All of the fragments show irregular in form and various size from 3mm to 0.1 mm. Quartz shows wavy extinction. Orthoclase shows perthite structure and carlsbad twinning. In some granite fragments, orthoclase shows intergraphic texture with quartz. Plagioclase shows albite twinning and weak zonal structure. Main constituent mineral of matix is glass, and others are fine grained carbonates, barite and a few amount of opaque minerals. In this sample, some large grains of fragments look like corroded by glass.	

Sample No.	Locality	Formation	Rock Name	Microscopic Observation	Remarks
MR-1 -1145	MR-1 145.30	Basement	Granite intrud-ed by barite-felsic vein	This is granular granite, which is intruded by barite and fine felsic quartz, orthoclase, a few amount of plagioclase and biotite. Quartz shows wavy extinction and 5 ~ 1.0mm in size. It contains inclusions of biotite. Orthoclase (5 ~ 1mm) shows perthite structure, plagioclase shows stripe twinning and a minor amount. Biotite in subhedral form and brown to reddish brown colour. Vein is composed of barite, fine felsic mirerals, muscovite and opaque minerals. Barite shows lath-shaped and clustared cryatals (2mm in length).	
MR-1 -1148	MR-1 148.00	Basement	Granite	This is granular in texture and mainly composed of quartz, plagioclase, orthoclase and biotite. Quartz is sized 7.0mm in maximum and shows wavy extinction. Plagioclase shows albite and stripe twinning, and zonal structure. It is suffered by weak sericitization and 3 ~ 1.0mm in length. Orthoclase shows perthite structure and is weakly turbid in the interior. Biotite (up to 1.0mm) is subhedral form and light yellow to brown in colour. The other accessory minerals are magnetite and zircon.	Photo-micrograph: Fig. III-6, No. 2

Sample No.	Locality	Formation	Rock Name	Microscopic Observation	Remarks
MR-2 -2221	MR-2 221.00	P - T	Siltstone	The rock shows clastic texture. Fragments are fine grained (up to 0.1mm) quartz and feldspars. All of the fragments are rounded. In parts, aggregates of the fragments are scattered like spot (5 ~ 3mm in size). Matrix has two facies; one is carbonates rich part and the other is Fe-oxide-rich part. Other matrix minerals are sericite and glass.	
MR-2 -2231	MR-2 231.60	P - T	Arkose sand-stone & silt-stone	In the rock, there are two facies, coarser band and finer band. The coarser band is made of fragments, which is wavy extinctioned quartz and a little turbid feldspar (0.4 ~ 0.5mm in size) and matrix is fine grained carbonates barite, sricite and glass. The finer band is composed of fine grained fragments (0.1 ~ 0.02mm in size) and matrix. Mineral assemblages of two band are nearly the same. Fine grained opaque minerals are scattered in the rock.	Photo-micrograph : Fig. III-6, No. 3

Sample No.	Locality	Formation	Rock Name	Microscopic Observation	Remarks
MR-2 -2261	MR-2 261.00m	P - T	Arkose sandstone	The rack shows clastic texture. Fragments are quartz, orthoclase, plagiocase and granite. All of fragments are rounded and coated by brownish iron-oxide. Quartz is most abundant and shows wavy extinction (up to 9mm in size). Feldspars show albite and carlsbad twinning, and in parts, orthoclase shows micrographic texture with quartz. Matrix is composed of lath-shaped barite, sericite, recrystallized fine grained felsic minerals and opaque minerals.	
MR-2 -2263	MR-2 263.00m	P - T	Arkose sandstone	This sample is the nearly same as the sample No. MOR-2-2261. This matrix has more barite and sericite than the above.	
MR-2 -2264	MR-2 265.10m	Basement	Aplitic granite	This is granular in texture and mainly composed of quartz, plagioclase, orthoclase and biotite. Quartz shows wavy extinction and mirmekitic texture with feldspars in crystal margin. Quartz is up to 3.0mm in size and contains inclusions of feldspars. Plagioclase shows albite twinning and subhedral form. It is sufferd of sericitization. Orthoclase is mostly turbid in the interior, owing to alteration. Biotite is also altered to secondary minerals. Other accessory minerals are apatite and opaque minerals.	

Sample No.	Locality	Formation	Rock Name	Microscopic Observation	Remarks
HM-5 -5289	HM-5 289.00m	P - T	Siltstone	This is clastic in texture and composed of quartz, feldspar fragments and matrix minerals. All of the fragments are rounded and about 0.15mm in size. Quartz is most abundant and shows wavy extinction. Feldspars show twinning and weak sericitization. Matrix is maily composed of recrystallized carbonates and fine felsic minerals (0.05mm in size). Other matrix minerals are opaque minerals, a few amount of epidote and glass.	
HM-5 -5310	HM-5 310.00m	P - T	Arkose sandstone	The rock shows clastic textue. Fragments are made of quartz, orthoclase and plagiocalse. They are rounded in form and various grain size from 3.0mm to 0.1mm. Quartz is most aboundant and shows wavy extinction. Orthoclase shows perthite structure and grid twinning, in parts. It contains inclusions of intergraphic quartz and platy biotite. Plagioclase shows albite twinning and weakly suffered of sericitization. All of fragments are coated by limonite. Matrix is recrystallized to quartz, feldspars and barite. Barite shows accicular and aggregates in form (0.7mm). Opaque minerals are scattered in the matrix.	

Sample No.	Locality	Formation	Rock Name	Microscopic Observation	Remarks
HM-5 -5315	HM-5 315.00	Basement	Aplitic granite	The rock is aplitic granite intruded by limonite veins. Aplitic granite is the same as the sample No.HM-5-5316. Vein is up to 1.0mm in width and is composed of limonite, barite and chalcedonie quartz. Limonite is dark red to yellowish red in colour and contains, xenocrysts of irregular quartz and feldspars. In parts of vein, barite occurs in acicular form (0.5mm in size) and aggregates. Barite is often coated by limonite. Chalcedonie quartz (up to 0.1mm in size) occurs frequently in the vein.	
HM-5 -5316	HM-5 316.00	Basement	Aplitic granite	The rock shows granular texture and is composed of quartz, orthoclase, plagioclase and biotite. Quartz (up to 4.0mm) shows wavy extinction and intergraphic texture with orthoclase, frequently. Orthoclase (up to 4.0mm) shows perthite structure and grid twinning, partly. Plagioclase (up to 3.0mm) shows albite twinning and contains inclusions of mirmekitic quartz. Biotite (about 0.7mm) is platy in form and brown to pale brown in colour. It is closely coexisted with opaque minerals and partly altered to chlorite. Limonite stringer occurs along cleavage of feldspar.	Photo-micrograph: Fig. III-6, No. 4

Table III—12 Microscopic Observations of Polished Sections

Sample No.	Locality	Formation	Rock Name	Microscopic Observation	Remarks
MR-1-1075	MR-1	P-T	Silstone	Ore minerals are galena, sphalerite, chalcocite and a few amount of pyrite. They are closely coexisted and show anhedral form. They occupy irregular interspaces (matrix) of the rock. Frangements are rounded gangue minerals.	Photomicrograph: Fig. III-7, No.1
MR-1-1132	MR-1	P-T	Siltstone	Ore minerals are fine grained chalcopyrite, chalcocite, covellite and pyrite. They are closely coexisted and scattered in matrix of the rock. Fragments are rounded gangue minerals.	Photomicrograph: Fig. III-7, No.2
MR-1-1145	MR-1 145m30	Basement	Granite	Chalcopyrite and chalcocite are present but in very minor amounts. Granules of pyrite are dispersed in the rock.	
MR-2-2221	MR-2 221m00	P-T	Siltstone	Covellite vein (about 0.1mm width) occurs and fine grained rutile is scattered in the rock.	Photomicrograph: Fig. III-7, No.4
MR-2-2263	MR-2	P-T	Arkose sandstone	Granules pyrite and hematite are observed in the rock.	
HM-5-5315	HM-5 315m00-316m00	Basement	Aplitic granite	Ore minerals could not be observed without hematite and limonite.	

Table III—13 Results of X-ray Microanalysis

Sample No.	Locality	Formation	Rock Name	Microscopic Observation	Remarks
MR-1-1075	MR-1 75^{m}.50	P-T	Siltstone	It is recognized in X-ray reflective images that galena, chalcocite and sphalerite are closely coexisted with each other.	Photo-micrograph: Fig. III-8, No. 1
MR-1-1132	MR-1 132^{m}.40	P-T	Siltstone	It is detected by Cu and Fe X-ray reflective images that chalcopyrite and chalcocite are closely coexisted. Rutile is recognized in Ti X-ray reflective image.	Photo-micrograph: Fig. III-8, No. 2
MR-1-1145	MR-1 145^{m}.30	Basement	Granite	Needle like crystal of chalcopyrite is occured in gangue mineral and recognized in X-ray reflective images.	Photo-micrograph: Fig. III-8, No. 3
MR-2-2263	MR-2 263^{m}.00	P-T	Arkose sandstone	Covellite is detected by Cu and S X-ray reflective images.	Photo-micrograph: Fig. III-8, No. 4

Table III—14 U, Ba and Pb in Core of Drill Hole, MR-1

Sample No.	Rock Name	Pb (ppm)	Ba %	U %	Depth (m)
1030	mudstone	-	-	< 0.002	30.00~ 31.00
1047	mudstone	-	-	< 0.002	47.00~ 48.00
1048	mudstone	-	-	< 0.002	48.00~ 48.60
1055	mudstone	-	-	< 0.002	55.60~ 56.60
1056	mudstone	-	-	< 0.002	56.60~ 57.50
1057	mudstone	-	-	< 0.002	57.50~ 59.00
1061	mudstone	-	-	< 0.002	61.60~ 62.60
1062	mudstone	-	-	< 0.002	62.60~ 63.60
1074	mudstone	-	-	< 0.002	74.60~ 75.20
1075	mudstone	-	-	0.005	75.20~ 75.60
1076	mudstone	-	-	< 0.002	75.60~ 76.60
1115	mudstone	-	-	< 0.002	115.50~116.30
1116	mudstone	-	-	< 0.002	116.30~117.30
1117	mudstone	-	-	< 0.002	117.30~118.30
1118	mudstone	-	-	< 0.002	118.30~119.30
1132	mudstone	-	-	< 0.002	132.50~132.80
1133	mudstone	-	-	< 0.002	133.10~133.30
1138	mudstone	-	-	< 0.002	138.00~139.00
1139	mudstone	-	-	< 0.002	139.00~140.00
1140	mudstone	14	0.54	< 0.002	140.00~141.00
1141	mudstone	22	0.24	< 0.002	141.00~142.00
1142	mudstone	42	0.14	< 0.002	142.00~143.00
1143	mudstone	14	0.13	< 0.002	143.00~144.00
1144	arkose	12	0.30	< 0.002	144.00~145.00
1145	granite	28	8.40	< 0.002	145.00~146.00

Table III—15 U, Ba and Pb in Core of Drill Hole, MR-2

Sample No.	Rock Name	Pb (%)	Ba (%)	U (%)	Depth (m)
2160	siltstone	-	-	< 0.002	160.00~160.10
2167	siltstone	0.008	-	< 0.002	167.00~168.00
2169	siltstone	0.007	-	< 0.014	169.00~170.00
2170	siltstone	0.008	-	< 0.002	170.00~170.60
2221	mudstone	-	-	< 0.002	221.00~221.20
2230	siltstone	-	-	< 0.002	230.00~231.00
2231	mudstone	-	-	< 0.002	231.00~232.50
2242	mudstone	-	-	< 0.002	242.60~243.60
2243	siltstone	-	-	< 0.002	243.60~244.60
2244	siltstone	-	-	< 0.002	244.60~245.60
2245	siltstone	-	-	< 0.002	245.60~246.60
2246	siltstone	-	-	< 0.002	246.60~247.60
2247	siltstone	-	-	< 0.002	247.60~248.00
2248	siltstone	-	-	< 0.002	248.00~249.00
2249	siltstone	-	-	< 0.002	249.00~250.00
2250	siltstone	-	-	< 0.002	250.00~251.00
2251	arkose	-	-	< 0.002	251.00~252.00
2252	mudstone	-	-	< 0.002	252.00~253.00
2253	arkose	-	-	< 0.002	253.00~254.00
2254	arkose	-	-	< 0.002	254.00~255.00
2255	arkose	-	-	< 0.002	255.00~256.00
2256	arkose	-	-	< 0.002	256.00~257.00
2257	arkose	-	-	< 0.002	257.00~258.00
2258	sandstone	- (ppm)	-	< 0.002	258.00~259.00
2259	arkose	136	0.28	< 0.002	259.00~260.00
2260	arkose	100	4.60	< 0.002	260.00~261.00
2261	arkose	114	5.00	< 0.002	261.00~262.00
2262	arkose	116	4.60	< 0.002	262.00~263.00
2263	arkose	220	5.00	< 0.002	263.00~264.00
2264	aplitic granite	144	0.84	< 0.002	264.00~265.20

Table III—16 U and Pb in Core of Drill Hole, MR-3

Sample No.	Rock Name	Pb (%)	Ba (%)	U (%)	Depth (m)
3131	siltstone	0.003	-	< 0.002	131.10~132.10
3132	siltstone	0.003	-	< 0.002	132.10~133.10
3133	siltstone	0.003	-	< 0.002	133.10~134.10
3134	siltstone	0.004	-	< 0.002	134.10~135.10
3135	siltstone	0.007	-	< 0.002	135.10~136.60

Table III—17 Ba and Pb in Core of Drill Hole, HM-3

Sample No.	Rock Name	Pb (ppm)	Ba (%)	U (%)	Depth (m)
3362		78	0.17	-	362.00~363.00
3364		700	0.10	-	364.00~365.00
3366		42	0.06	-	366.00~367.00
3368		58	0.06	-	368.00~369.00
3370		36	0.13	-	370.00~371.00
3372		22	0.34	-	372.00~373.00
3374		70	0.20	-	374.00~375.00
3376		72	0.24	-	376.00~377.00
3378		136	0.32	-	378.00~379.00
3380		66	0.30	-	380.00~381.00
3382		82	0.16	-	382.00~383.00
3384		42	0.06	-	384.00~385.00
3386		36	0.10	-	386.00~387.00
3388		78	0.58	-	388.00~389.00
3390		138	0.13	-	390.00~391.00
3392		70	0.19	-	392.00~393.00
3394		82	0.04	-	394.00~395.00
3396		58	0.06	-	396.00~397.00

Table III—18 U, Ba and Pb in Core of Drill Hole, HM-5

Sample No.	Rock Name	Pb (ppm)	Ba (%)	U (%)	Depth (m)
5307	sandstone	16	0.05	-	307.00~308.00
5308	arkose	42	0.56	-	308.00~309.00
5309	arkose	40	2.96	-	309.00~310.00
5310	arkose	46	3.52	< 0.002	310.00~311.00
5311	arkose	70	0.76	< 0.002	311.00~312.00
5312	arkose	66	0.56	0.002	312.00~313.00
5313	arkose	40	1.60	< 0.002	313.00~314.00
5314	arkose	44	2.32	< 0.002	314.00~315.00