GEOLOGIC CORE LOG OF MJKS-5 (3/4)

1/200

MJKS-5 (3/4) 100m ~ 150m

Level 2,842.7m Direction 90°
X -123.9m Inclination -60°
Y -333.7m Length 165.0m

LITHOLOGY	DEPTH (m)	DESCRIPTIONS
	100.1	100.1-100.4m, brownish gray clay
	100.4	100.4-113.8m, greenish gray epidote altered granite
		100.9m, W=1cm fluorite veinlet
	109.4	109.4-109.48m, W=8cm white clay
	109.48	
	113.8	113.8-114.9m, silicified altered granite, containing Mn-siderite veinlet and limonite
	114.9	114.9-122.1m, pale pink granite
	122.1	122.1-123.3m, silicified altered granite
	122.9	122.9-122.98m, W=8cm quartz Mn-siderite vein, cp hematite imp.
	122.98	123.3 W=2.5cm quartz vein
	123.3	123.3-140.9m, pale greenish pink granite
	140.9	140.9-142.5m, greenish gray beresite altered granite
	142.5	142.5-145.1m, Mn-siderite vein, containing hematite malachite, cp imp.
	145.1	around 143m, quartz containing
	147.5	145.1-147.5m, greenish gray beresite altered granite
		147.5-165.0m, pink cog granite

DEPTH (m)	SAMPLE No.	ASSAY RESULT Au	Ag	Cu	As	LAB. TEST
	6KS164					X
	6KS165					X
113.8	6KS128	0.04	<0.3	<0.05	<0.03	
114.9						
122.1						
122.9	6KS129	0.04	<0.3	<0.05	<0.03	P
122.98	6KS130	3.0	<0.3	0.72	<0.03	
123.3	6KS131	1.0	<0.3	<0.05	<0.03	P
	6KS130	3.0	<0.3	0.72	<0.03	
141.5	6KS132	0.1	<0.3	<0.05	<0.03	T
142.5	6KS133	2.6	0.40	1.18	<0.03	P, F
143.5	6KS134	1.6	<0.3	0.70	<0.03	P
144.5	6KS135	4.2	0.49	1.41	<0.03	
145.1	6KS136	0.12	<0.3	<0.05	<0.03	
146.1						
	6KS156					T

GEOLOGIC CORE LOG OF MJKS-5 (4/4)

1/200

MJKS-5 (4/4) 150m ~ 165m

Level 2,842.7m	Direction 90°
X -123.9m	Inclination -60°
Y -333.7m	Length 165.0m

LITHO-LOGY	DEPTH (m)	DESCRIPTIONS	DEPTH (m)	SAMPLE No.	ASSAY RESULT Au	Ag	Cu	As	LAB. TEST
+ + +	165.0	147.5-165.0m, pink csg granite							

GEOLOGIC CORE LOG OF MJKS-6 (1/4)

1/200

MJKS-6 (1/4) 0 m ~ 50 m

Level 2,804.4 m Direction 90°
X -167.8m Inclination -60°
Y -445.6m Length 170.1m

LITHOLOGY	DEPTH (m)	DESCRIPTIONS	DEPTH (m)	SAMPLE No.	ASSAY RESULT Au	Ag	Cu	As	LAB. TEST
	0.4	0-0.4m, detritus with granite pebbles							
		0.4-3.85m, pink medium-grained granite							
	3.85	3.85-4.2m, olive gray clay, sticky, containing granite pebble 4-5mm		6KS159					X
		4.2-10.3m, pinkish mdg altered granite, epidote alteration							
	10.3	10.3-14.8m, pink mdg granite							
	14.8	14.8-41.6m, pink granite porhyry							
		26.4m, W=3cm olive gray clay							
	41.6	41.6-49.3m, pink coase-grained granite, partly epidote alteration							
	49.2	49.3-60.9m, pink granite porphyry							

GEOLOGIC CORE LOG OF MJKS-6 (2/4)

1/200

MJKS-6 (2/4) 50 m ~ 100 m

Level 2,804.4m Direction 90°
X -167.8m Inclination -60°
Y -445.6m Length 170.1m

LITHOLOGY	DEPTH (m)	DESCRIPTIONS	DEPTH (m)	SAMPLE No.	ASSAY RESULT Au	Ag	Cu	As	LAB. TEST
		49.3-60.9m, pink csg porphyritic granite, partly epidotization							
	60.9								
	61.3	60.9-61.3m, greenish gray altered granite, partly epidotization							
		61.3-75.8m, pink csg porphyritic granite							
	75.8	75.8-76.6m, greenish gray altered granite, partly epidotization							
	76.6	76.15m 挟=2cm gray clay							
		76.6-90.7m, pink csg porphyritic granite							
		80.2-81.6m, partly weak epidotization							
	90.7								
		90.7-96.8m, gray altered csg porphyritic granite, plagioclase rich							
	96.8			6KS155					X
	97.1	96.8-97.1m, brownish gray clay							
		97.1-102.6m, gray altered csg porphyritic granite							

GEOLOGIC CORE LOG OF MJKS-6 (3/4)

1/200

MJKS--6 (3/4) 100m ~ 150m

Level 2,804.4m Direction 90°
X -167.8m Inclination -60°
Y -445.6m Length 170.1m

LITHOLOGY	DEPTH (m)	DESCRIPTIONS
		97.1-102.6m, cream gray altered csg porhyritic granite
	102.6	
		102.6-116.6m, pink csg porhyritic granite
		114.6m, W=0.5cm carbonate vein (60)
	116.6	
		116.6-122.2m, cream gray altered csg granite
	122.2	
	122.8	122.2-122.8m, pink csg granite
		122.8-1130.6m, cream gray altered csg granite
		128.9m, W=1.5cm whitish brown Mn-siderite vein (70)
	130.6	
		130.6-133.9m, greenish gray beresite altered granite, weak silicified, containing epidote, chlorite and Mn-oxide
	133.9	
		133.9-145.2m, W=11.3m Quartz Mn-siderite vein, limonite rich, banded structure distinct, cp. and malachite imp. (60) 133.9-139.2m quartz rich 139.2-145.2m Mn-siderite rich
		139.2m, predominant needle aggregates of malachite
	145.2	
		145.2-147.0m, gray beresite altered granite
	147.0	
		147.0-m, pink csg granite

DEPTH (m)	SAMPLE No.	ASSAY RESULT Au	Ag	Cu	As	LAB. TEST
130.6	6KS137	0.09	<0.3	<0.05	<0.03	
131.6	6KS138	0.09	<0.3	<0.05	<0.03	I
132.6	6KS139	0.03	<0.3	<0.05	<0.03	
133.9	6KS140	14.6	0.70	1.94	<0.03	P, F
134.9	6KS141	2.4	<0.3	0.84	<0.03	P
135.9	6KS142	4.0	<0.3	1.06	<0.03	
136.9	6KS143	3.2	<0.3	0.27	<0.03	
137.9	6KS144	5.2	0.69	1.51	<0.03	P
138.9	6KS145	6.6	0.70	2.01	<0.03	P, F
139.9	6KS146	5.6	1.30	2.71	<0.03	
140.9	6KS147	5.0	0.94	1.36	<0.03	
141.9	6KS148	7.6	1.00	1.22	<0.03	P
142.9	6KS149	9.0	0.92	0.89	<0.03	
143.9	6KS150	8.0	0.62	0.78	<0.03	
144.9	6KS151	4.4	0.37	0.57	<0.03	
145.2	6KS152	1.2	<0.3	0.17	<0.03	
146.2	6KS153					T

GEOLOGIC CORE LOG OF MJKS--6 (4/4)

1/200

MJKS--6 (4/4) 150m ~ 170m

Level 2,804.4m Direction 90°
X -167.8m Inclination -60°
Y -445.6m Length 170.1m

LITHOLOGY	DEPTH (m)	DESCRIPTIONS	DEPTH (m)	SAMPLE No.	ASSAY RESULT Au	Ag	Cu	As	LAB. TEST
		147.0-155.75m, pink osg granite							
	155.75								
		155.75-159.1m, brown clay, sticky							
				6KS154					X
	159.1								
		159.1-170.1m, pink mdg granite sandy crushed							
	170.1								

GEOLOGIC CORE LOG OF MJKS-7 (1/3)

1/200

MJKS-7 (1/3) 0 m ~ 50 m

Level 2,825.9m Direction -
X -48.0m Inclination -90°
Y 455.0m Length 150.0m

LITHOLOGY	DEPTH (m)	DESCRIPTIONS	DEPTH (m)	SAMPLE No.	ASSAY RESULT Au	Ag	Cu	As	LAB. TEST
	5.25	0-5.25m, tatus with pink K-feldspar rich granite pebbles							
	44.95	5.25-44.95m, greenish gray epidotizatled granite porphyry							
		44.95-51.9m, greenish gray altered granite, containing muscovite, Mn-oxides imp.							

GEOLOGIC CORE LOG OF MJKS-7 (2/3)

1/200

MJKS-7 (2/3) 50m ~ 100m

Level 2,825.9m Direction -
X -48.0m Inclination -90°
Y 455.0m Length 150.0m

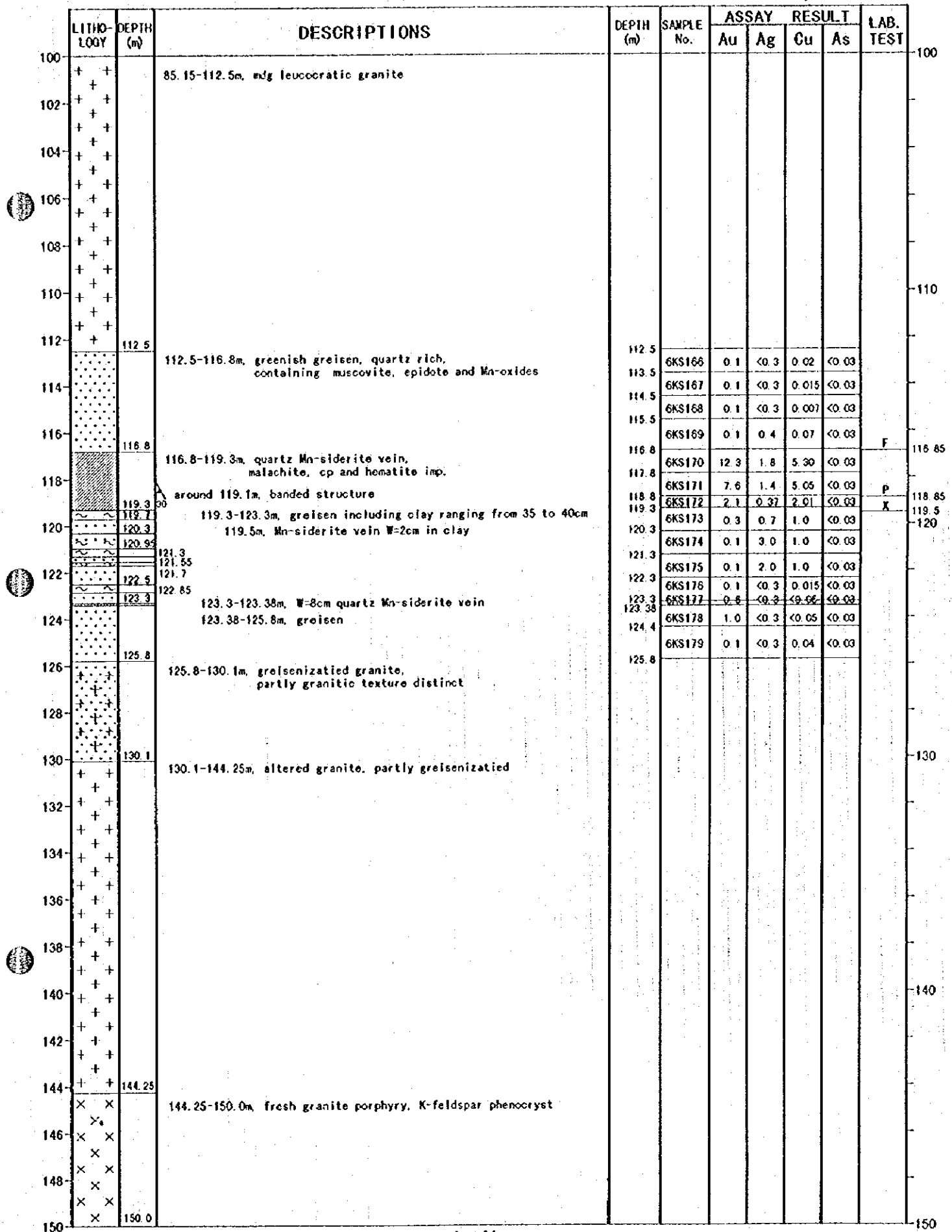
LITHOLOGY	DEPTH (m)	DESCRIPTIONS	DEPTH (m)	SAMPLE No.	ASSAY RESULT Au	Ag	Cu	As	LAB. TEST
	51.9	44.95-51.9m, greenish gray altered granite, containing muscovite							
	67.3	51.9-67.3m, mdg gray granite, partly K-feldspar porphyritic structure							
	70.6	67.3-70.6m, greenish aplite							
	73.6	70.6-73.6m, mdg gray granite, containing K-feldspar							
	78.2	73.6-78.2m, altered granite, containing Mn-oxides along fracture							
	81.6	78.2-81.6m, mdg gray granite							
	85.15	81.6-85.15m, mdg pink granite							
		85.15-112.5m, whitish gray leucocratic mdg granite							
		99.6m, limonite imp. along joint							

GEOLOGIC CORE LOG OF MJKS-7 (3/3)

1/200

MJKS-7 (3/3) 100m ~ 150m

Level 2,825.9m Direction -
X -48.0m Inclination -90°
Y 455.0m Length 150.0m



DEPTH (m)	SAMPLE No.	ASSAY RESULT Au	Ag	Cu	As	LAB. TEST
112.5						
	6KS166	0.1	<0.3	0.02	<0.03	
113.5						
	6KS167	0.1	<0.3	0.015	<0.03	
114.5						
	6KS168	0.1	<0.3	0.007	<0.03	
115.5						
	6KS169	0.1	0.4	0.07	<0.03	F
116.8						
	6KS170	12.3	1.8	5.30	<0.03	
117.8						
	6KS171	7.6	1.4	5.05	<0.03	P
118.8						
119.3	6KS172	2.1	0.37	2.01	<0.03	X
	6KS173	0.3	0.7	1.0	<0.03	
120.3						
	6KS174	0.1	3.0	1.0	<0.03	
121.3						
	6KS175	0.1	2.0	1.0	<0.03	
122.3						
	6KS176	0.1	<0.3	0.015	<0.03	
123.3	6KS177	0.5	<0.3	<0.05	<0.03	
123.38						
	6KS178	1.0	<0.3	<0.05	<0.03	
124.4						
	6KS179	0.1	<0.3	0.04	<0.03	
125.8						

GEOLOGIC CORE LOG OF MJKS-8 (1/4)

1/200

MJKS-8 (1/4) 0m ~ 50m

Level 2,891.6m Direction -
X -25.9m Inclination -90°
Y 3.9m Length 160.0m

LITHOLOGY	DEPTH (m)	DESCRIPTIONS	DEPTH (m)	SAMPLE No.	ASSAY RESULT Au	Ag	Cu	As	LAB. TEST
		0-4.4m, detritus with pink K-feldspar rich granite pebbles							
	4.4								
		4.4-16.4m, csg pink K-feldspar rich granite							
	16.4								
	17.0	16.4-17.0m, white clay, sticky							
		17.0-19.0m, csg pink K-feldspar rich granite							
	19.0								
	19.5	19.0-19.5m, white clay, sticky							
		19.5-36.2m, csg pink K-feldspar rich granite							
	36.2								X
	36.4	36.2-36.5m, brown gray clay	36.5	6KS221					
	39.5	36.5-41.6m, greisen, greenish, aditional quartz, muscovite and Mn-oxide	37.5	6KS206	<0.005	<0.3	0.004	<0.03	
			38.5	6KS207	<0.005	<0.3	0.005	<0.03	
			39.5	6KS208	<0.005	<0.3	0.005	<0.03	
			40.5	6KS209	<0.005	<0.3	0.004	<0.03	
	41.6		41.6	6KS210	<0.005	<0.3	0.003	<0.03	
		41.6-45.8m, csg pink K-feldspar rich granite							
	45.8								
	46.1	45.8-46.1m, grayish brown clay, sticky							
	47.1	46.1-47.1m, greenish gray altered granite, partly fluorite							
		47.1-66.7m, csg pink K-feldspar rich granite							

GEOLOGIC CORE LOG OF MJKS-8 (2/4)

1/200

MJKS-8 (2/4) 50m ~ 100m

Level 2,891.6m Direction -
X -25.9m Inclination -90°
Y 3.9m Length 160.0m

LITHOLOGY	DEPTH (m)	DESCRIPTIONS	DEPTH (m)	SAMPLE No.	ASSAY RESULT Au	Ag	Cu	As	LAB. TEST
		47.1-66.7m, csg pink K-feldspar rich granite							
	66.7								
		66.7-80.5m, pale green granite, not greizeniation							
	80.5								
		80.5-84.0m, csg pink K-feldspar rich granite							
	84.0								
		84.0-85.9m, pale green granite							
	85.9								
		85.9-86.0m, cream clay							
	86.0								
		86.0-87.75m, pale green granite							
	87.75								
		87.75-102.9m, white to pale green aplite, partly showing granitic texture							

GEOLOGIC CORE LOG OF MJKS-8 (3/4)

1/200

MJKS-8 (3/4) 100m ~ 150m

Level 2,891.6m Direction -
X -25.9m Inclination -90°
E 3.9m Length 160.0m

LITHOLOGY	DEPTH (m)	DESCRIPTIONS
		87.75-102.9m, white aplite, partly granitic texture
	102.9	
		102.9-117.0m, feucocratic aplitic granite, weak greisenization, fluorite, muscovite, weak silicified
	117.0	
		117.0-131.8m, greenish altered granite, epidote, chlorite, muscovite
	131.8	131.8-137.0m, greisen, containing Mn-oxide
	132.0	132.0-132.1m, gray clay
	132.1	
	137.0	
	137.5	137.0-137.5m, silicified greisen
		137.5-137.8m, gray clay with greisen pebbles of less than 0.5mm
	137.8	137.8-140.7m, greisen, containing Mn-oxide
	140.0	140.0m, W=3cm cream clay
	140.7	
		140.7-149.5m, green altered granite
	149.5	
		149.5-160.0m, mdg greenish weak altered granite

DEPTH (m)	SAMPLE No.	ASSAY RESULT Au	Ag	Cu	As	LAB. TEST
131.8						
132.8	6KS211	<0.005	<0.3	0.002	<0.03	
133.8	6KS212	<0.005	<0.3	0.004	<0.03	
134.8	6KS213	<0.005	<0.3	0.007	<0.03	
135.8	6KS214	<0.005	<0.3	0.005	<0.03	
137.0	6KS215	<0.005	<0.3	0.003	<0.03	
137.5	6KS216	<0.005	<0.3	0.03	<0.03	X
137.8	6KS220					
138.8	6KS217	<0.005	<0.3	0.03	<0.03	
139.8	6KS218	<0.005	<0.3	0.02	<0.03	
140.7	6KS219	<0.005	<0.3	0.05	<0.03	

GEOLOGIC CORE LOG OF MJKS-8 (4/4)

1/200

MJKS-8 (4/4) 150m ~ 160m

Level 2,891.6m Direction -
X -25.9m Inclination -90°
Y 3.9m Length 160.0m

LITHOLOGY	DEPTH (m)	DESCRIPTIONS	DEPTH (m)	SAMPLE No.	ASSAY RESULT Au	Ag	Cu	As	LAB. TEST
+ +	160.0	149.5-160.0m, mdg greenish pink granite							

150 152 154 156 158 160 162 164 166 168 170 172 174 176 178 180 182 184 186 188 190 192 194 196 198 200

GEOLOGIC CORE LOG OF MJKS-9 (1/3)

1/200

MJKS-9 (1/3) 0 m ~ 50 m

Level 2,871.3m Direction -
X -26.9m Inclination -90°
Y 152.6m Length 130.0m

LITHO-LOGY	DEPTH (m)	DESCRIPTIONS	DEPTH (m)	SAMPLE No.	ASSAY RESULT Au	Ag	Cu	As	LAB. TEST
		0-5.0m, detritus with greenish gray granite pebbles							
	5.0								
		5.0-13.5m, detritus with pink K-feldspar granite pebbles							
	13.5								
		13.5-17.7m, csg pink K-feldspar rich granite							
	17.7								
		17.7-63.1m, whitish gray granite porhyry							

GEOLOGIC CORE LOG OF MJKS-9 (2/3)

1/200

MJKS-9 (2/3) 50m ~ 100m

Level 2,871.3m Direction -
X -26.9m Inclination -90°
Y 152.6m Length 130.0m

LITHOLOGY	DEPTH (m)	DESCRIPTIONS
		17.7-63.1m, whitish gray granite porphyry, containing muscovite
	63.1	
		63.1-80.6m, leucocratic granite, containing muscovite
	80.6	
		80.6-87.6m, mdg pink granite
	87.6	
		87.6-91.5m, light white mdg granite
	91.5	
		91.5-105.85m, greisen, quartz and muscovite rich
		98.4m, 2x2x0.5cm Mn-siderite spot

DEPTH (m)	SAMPLE No.	ASSAY RESULT Au	Ag	Cu	As	LAB. TEST
91.5	6KS180	0.5	<0.3	<0.05	<0.03	
92.5	6KS181	<0.1	<0.3	0.012	<0.03	
93.5	6KS182	<0.1	0.9	0.007	<0.03	
94.5	6KS183	0.1	<0.3	0.009	<0.03	
95.5	6KS184	<0.1	<0.3	0.012	<0.03	
96.5	6KS185	0.1	<0.3	0.012	<0.03	
97.5	6KS186	0.2	<0.3	0.007	<0.03	
98.5	6KS187	0.1	<0.3	0.007	<0.03	
99.5	6KS188	0.1	<0.3	0.04	<0.03	

GEOLOGIC CORE LOG OF MJKS-9 (3/3)

1/200

MJKS-9 (3/3) 100m ~ 130m

Level 2,871.3m Direction -
X -26.9m Inclination -90°
Y 152.6m Length 130.0m

LITHOLOGY	DEPTH (m)	DESCRIPTIONS
	105.85	91.5-105.85m, greisen, quartz and muscovite rich
		105.85-109.65m, quartz Mn-siderite vein, cp, malachite, hematite imp. specularite imp., 105.85-105.95m quartz rich
		calcite veinlet W=2mm
	109.65	109.65-109.75m, W=10cm, cream clay
	109.75	109.75-115.0m, greisen, quartz and muscovite rich
	115.0	115.0-130.0m, mdg epidote altered granite, muscovite imp.
	130.0	

DEPTH (m)	SAMPLE No.	ASSAY RESULT Au	Ag	Cu	As	LAB. TEST
100.5	6KS188	0.1	<0.3	0.04	<0.03	
101.5	6KS189	0.1	<0.3	0.009	<0.03	
102.5	6KS190	0.1	<0.3	0.009	<0.03	
103.5	6KS191	0.1	<0.3	0.02	<0.03	
104.5	6KS192	0.3	<0.3	0.015	<0.03	
105.85	6KS193	0.1	<0.3	0.02	<0.03	F
106.85	6KS194	2.4	0.40	1.02	<0.03	
107.85	6KS195	4.8	0.58	1.93	<0.03	P
108.85	6KS196	3.2	0.37	0.71	<0.03	
109.65	6KS197	1.2	<0.3	<0.05	<0.03	X
109.75	6KS198	0.9	<0.3	<0.05	<0.03	
110.75	6KS199	1.0	<0.3	<0.05	<0.03	
111.75	6KS200	0.1	0.4	0.012	<0.03	
112.75	6KS201	0.1	0.5	0.03	<0.03	
113.75	6KS202	0.1	<0.3	0.009	<0.03	
115.0						

GEOLOGIC CORE LOG OF MJKS-10 (1/6)

1/200

MJKS-10 (1/6) 0m ~ 50m

Level 2,804.4 m Direction 145°
X -166.7m Inclination -75°
Y -446.9m Length 290.0m

LITHOLOGY	DEPTH (m)	DESCRIPTIONS	DEPTH (m)	SAMPLE No.	ASSAY RESULT Au	Ag	Cu	As	LAB. TEST
	0.4	0-0.4m, detritus with granite pebbles							
	1.6	0.4-1.6m, pink csg granite							
		1.6-8.2m, slime of pink granite							
	8.2	8.2-18.0m, csg pink granite							
	18.0	18.0-18.2m, cream clay							
	18.2	18.2-68.5m, csg pink granite							
		csg pink granite							
		csg pink granite							
		csg pink granite							

GEOLOGIC CORE LOG OF MJKS-10 (2/6) 1/200

MJKS-10 (2/6) 50m ~ 100m

Level 2,804.4 m Direction 145°
X -166.7m Inclination -75°
Y -446.9m Length 290.0m

LITHOLOGY	DEPTH (m)	DESCRIPTIONS	DEPTH (m)	SAMPLE No.	ASSAY RESULT Au	Ag	Cu	As	LAB. TEST
		18.2-68.5m, csg pink biotite granite							
		csg pink biotite granite							
	68.5								
		68.5-69.85m, green epidotizated altered granite							
	69.85								
		69.85-107.2m, csg pink granite							
		csg pink biotite granite							
		csg pink biotite granite							

GEOLOGIC CORE LOG OF MJKS-10 (3/6) 1/200

MJKS-10 (3/6) 100m ~ 150m

Level 2,804.4 m Direction 145°
X -166.7m Inclination -75°
Y -446.9m Length 290.0m

LITHOLOGY	DEPTH (m)	DESCRIPTIONS	DEPTH (m)	SAMPLE No.	ASSAY RESULT Au	Ag	Cu	As	LAB. TEST
		69.85-107.2m, pink csg granite							
	107.2								
		107.2-107.65m, green altered granite							
	107.65	107.65-120.35m, csg pink granite							
	120.35								
	121.3	120.35-121.3m, green epidotizated granite							
		121.3-124.55m, csg pink granite							
	124.55								
	125.75	124.55-125.75m, green altered granite							
		125.75-135.55m, csg pink granite							
	135.65								
	136.4	135.55-136.4m, green altered granite							
		136.4-138.3m, csg pink granite							
	138.3								
		138.3-143.0m, green beresite altered granite, Mn-oxide imp.							
		141.8-143m silicified							
	143.0								
		143.0-144.5m, slim of pink granite							
	144.5								
	144.75	144.5-144.75m, brownish gray beresite altered granite		6KS230					X
	145.0	144.75-145.0m, W=0.25m black brown clay, sticky							
	145.55	145.0-145.55m, slim of pink granite							
		145.55-157.9m, brownish gray beresite altered granite							

GEOLOGIC CORE LOG OF MJKS-10 (4/6) 1/200

MJKS-10 (4/6) 150m ~ 200m

Level 2,804.4 m Direction 145°
X -166.7m Inclination -75°
Y -446.9m Length 290.0m

LITHOLOGY	DEPTH (m)	DESCRIPTIONS	DEPTH (m)	SAMPLE No.	ASSAY RESULT Au	Ag	Cu	As	LAB. TEST
		145.55-157.9m, brownish pale green gray beresite altered granite, epidotization, Mn-oxide imp., almost silmed							
	157.9								
	158.0	157.9-158.0m, gray clay, containing altered granite pebble							
		158.0-172.9m, greenish gray beresite altered granite, limonitization, Mn-oxide contain							
		160-163m, strong limonitization							
		Mn-oxide film along joint 30°							
		Mn-oxide film along joint 20°							
		170-177m, chloritization rich							
	172.9								
	173.0	172.9-173.0m, cream clay							
		173.0-175.5m, greenish gray beresite altered granite							
	175.5								
	175.65	175.5-175.65m, cream clay		6KS231					X
		175.65-187.3m, brownish gray beresite altered granite, limonitization rich							
	187.3		187.3	6KS232	0.22	<0.3	0.0015	<0.03	
	187.5	187.3-187.5m, W=0.2m grayish white calcite vein, partly fluorite imp.	187.5						
		187.5-194.0m, brownish gray beresite altered granite, limonitization rich							
	194.0	194.0-194.05m, W=5cm grayish white quartz vein	194.0	6KS233	0.44	<0.3	0.007	<0.03	F
	194.05		194.05						
	194.1	194.05-194.1m, W=5cm cream clay							
		194.1-198.6m, greenish to brownish gray beresite altered granite, limonitization rich, Mn-oxide imp. weak silicified							
	198.6								
		198.6-217.55m, greenish beresite altered granite							

GEOLOGIC CORE LOG OF MJKS-10 (5/6) 1/200

MJKS-10 (5/6) 200m ~ 250m

Level 2,804.4 m Direction 145°
X -166.7m Inclination -75°
Y -446.9m Length 290.0m

LITHO-LOGY	DEPTH (m)	DESCRIPTIONS	DEPTH (m)	SAMPLE No.	ASSAY RESULT Au	Ag	Cu	As	LAB. TEST
		198.6-217.55m, greenish beresite altered granite							
		(211.5-213.1m, reddish clay for drilling)							
	217.55	217.55-290.0m, csg pink biotite hornblende granite							
		calcite film along joint							
		csg pink biotite hornblende granite							
		csg pink biotite hornblende granite							

GEOLOGIC CORE LOG OF MJKS-10 (6/6)

1/200

MJKS-10 (6/6) 250m ~ 290m

Level 2,804.4 m Direction 145°
X -166.7m Inclination -75°
Y -446.9m Length 290.0m

LITHOLOGY	DEPTH (m)	DESCRIPTIONS	DEPTH (m)	SAMPLE No.	ASSAY RESULT Au	Ag	Cu	As	LAB. TEST
		217.55-290.0m, csg pink biotite hornblende granite							
		csg pink hornblende biotite granite							
		csg pink hornblende biotite granite							
		calcite film along joint							
		csg pink hornblende biotite granite							
	290.0								

250 252 254 256 258 260 262 264 266 268 270 272 274 276 278 280 282 284 286 288 290 292 294 296 298 300

GEOLOGIC CORE LOG OF MJKS-11 (1/6)

1/200

MJKS-11 (1/6) 0m ~ 50m

Level 2,804.7 m Direction -
X -178.1m Inclination -90°
Y -445.5m Length 295.0m

LITHOLOGY	DEPTH (m)	DESCRIPTIONS	DEPTH (m)	SAMPLE No.	ASSAY RESULT Au	Ag	Cu	As	LAB. TEST
	0.3	0-0.4m, detritus with granite pebbles 0.3-10.1m, pink osg granite							
	10.1	10.1-10.3m, W=0.2m cream clay							
	10.3	10.3-12.5m, green altered granite							
	12.5	12.5-40.45m, osg pink granite							
	40.45	40.45-42.5m, cream clay, dry							
	42.5	42.5-58.2m, osg pink granite							

GEOLOGIC CORE LOG OF MJKS-11 (2/6)

1/200

MJKS-11 (2/6) 50m ~ 100m

Level 2,804.7 m Direction -
X -178.1m Inclination -90°
Y -445.5m Length 295.0m

LITHO-LOGY	DEPTH (m)	DESCRIPTIONS	DEPTH (m)	SAMPLE No.	ASSAY RESULT Au	Ag	Cu	As	LAB. TEST
		42.5-58.2m, csg pink granite							
	58.2								X
~ ~		58.2-59.7m, cream clay, dry, containing granite pebble		6KS229					
	59.3								
		59.3-185.2m, csg pink biotite granite							
		csg biotite pink-feldspar granite							

GEOLOGIC CORE LOG OF MJKS-11 (3/6) 1/200

MJKS-11 (3/6) 100m ~ 150m

Level 2,804.7 m Direction -
X -178.1m Inclination -90°
Y -445.5m Length 295.0m

LITHOLOGY	DEPTH (m)	DESCRIPTIONS	DEPTH (m)	SAMPLE No.	ASSAY RESULT Au	Ag	Cu	As	LAB. TEST
	100	59.3-185.2m. csg pink biotite granite							
	102								
	104								
	106								
	108								
	110	joint							
	112								
	114								
	116	joint							
	118								
	120								
	122								
	124								
	126								
	128								
	130	csg pink muscovite granite							
	132								
	134								
	136								
	138								
	140								
	142	csg pink biotite granite							
	144								
	146								
	148								
	150								

GEOLOGIC CORE LOG OF MJKS-11 (4/6) 1/200

MJKS-11 (4/6) 150m ~ 200m

Level 2,804.7 m Direction -
X -178.1m Inclination -90°
Y -445.5m Length 295.0m

LITHOLOGY	DEPTH (m)	DESCRIPTIONS
		59.3-185.2m, csg pink biotite hornblende granite, mafic mineral partly chloritizated and epidotizated
		epidotization along joint 10
		csg pink biotite hornblende granite, mafic mineral partly chloritizated and epidotizated
	185.2	
		185.2-193.9m, greenish beresite altered granite, amazonitizated, Mn-oxide imp.
		192-193.9m, greenish brown color, limonitization
	193.9	
		193.9-198.15m, pale green pink granite
	198.15	
		198.15-200.0m, pinkish green weak beresite altered granite
	200.0	

DEPTH (m)	SAMPLE No.	ASSAY RESULT Au	Ag	Cu	As	LAB. TEST
185.2	6KS234	0.20	0.3	0.005	<0.03	
186.2	6KS235	0.24	<0.3	0.009	<0.03	
187.2	6KS236	<0.1	0.7	0.007	<0.03	
188.2	6KS237	<0.1	0.7	0.004	<0.03	
189.2	6KS238	<0.1	<0.3	0.003	<0.03	
190.2	6KS239	<0.1	<0.3	0.003	<0.03	
191.2	6KS240	<0.1	<0.3	0.003	<0.03	
192.2	6KS241	<0.1	<0.3	0.004	<0.03	
193.2	6KS242	<0.1	<0.3	0.007	<0.03	
193.9						
198.15	6KS243	<0.1	0.5	0.005	<0.03	
199.15						
200.0	6KS244	<0.1	<0.3	0.003	<0.03	

GEOLOGIC CORE LOG OF MJKS-11 (5/6) 1/200

MJKS-11 (5/6) 200m ~ 250m

Level 2,804.7 m Direction -
X -178.1m Inclination -90°
Y -445.5m Length 295.0m

LITHOLOGY	DEPTH (m)	DESCRIPTIONS
	200.0	200.0-203.7m, csg pink granite
	203.7	203.7-206.2m, green to brown beresite altered granite, fluorite imp.
	204.0	204.0-204.15m, Mn-siderite veinlet (W= 0.5 to 1 cm) in altered granite
	204.15	
	206.2	206.2-208.1m, csg pink granite, partly greenish epidote altered
	208.1	208.1-210.15m, green to brown beresite altered granite, amazonite observed
	210.15	210.15-210.6m, W=0.45m, Mn-siderite vein, strong limonitization
	210.6	210.6-216.8m, greenish brown beresite altered granite, containing partly muscovite, Mn-oxide imp.
	216.8	
	217.5	216.8-217.5m, W=0.7m, cream gray clay containing green altered granite pebbles
		217.5-226.25m, greenish brown beresite altered granite, partly muscovite rich, Mn-oxide and limonitization rich
	226.25	
	226.65	226.25-226.65m, W=0.4m, olivie gray clay
	228.5	226.65-228.5m, greenish brown beresite altered granite, silicified partly muscovite rich, Mn-oxide and limonitization rich
		228.5-230.55m, W=2.05m, quartz Mn-siderite vein, malachite imp.
	230.55	15 boundary plane between Mn-siderite vein and altered granite
		230.55-237.0m, brown beresite altered granite, silicified fine black pyrite rich
	237.0	237.0-240.9m, csg pink granite, crushed
	240.9	240.9-242.8m, brownish gray beresite altered granite, limonitization
	242.8	242.8-243.0m, yellowish olive clay
	243.0	60
		243.0-250.9m, csg pink granite

DEPTH (m)	SAMPLE No.	ASSAY RESULT Au	Ag	Cu	As	LAB. TEST
203.7						
204.0	6KS245	<0.1	<0.3	0.005	<0.03	
204.15	6KS246	<0.1	<0.3	0.007	<0.03	
205.2	6KS247	<0.1	<0.3	0.003	<0.03	
206.2	6KS248	<0.1	<0.3	0.004	<0.03	
208.1						
208.1	6KS249	<0.1	<0.3	0.004	<0.03	
210.15	6KS250	<0.1	<0.3	0.004	<0.03	
210.6	6KS251	0.50	<0.3	0.2	<0.03	P
211.6	6KS252	<0.1	<0.3	0.2	<0.03	
212.6	6KS253	<0.1	<0.3	0.005	<0.03	
213.6	6KS254	<0.1	<0.3	0.04	<0.03	
214.6	6KS255	<0.1	<0.3	0.04	<0.03	
215.6	6KS256	<0.1	<0.3	0.03	<0.03	
216.8	6KS257	<0.1	<0.3	0.007	<0.03	
217.5	6KS258	<0.1	<0.3	0.007	<0.03	X
218.5	6KS259	<0.1	<0.3	0.004	<0.03	
219.5	6KS260	<0.1	<0.3	0.005	<0.03	
220.5	6KS261	0.9	<0.3	0.003	<0.03	
221.5	6KS262	<0.1	<0.3	0.003	<0.03	
222.5	6KS263	<0.1	<0.3	0.004	<0.03	
223.5	6KS264	<0.1	<0.3	0.003	<0.03	
224.5	6KS265	<0.1	<0.3	0.003	<0.03	
225.5	6KS266	0.86	<0.3	0.003	<0.03	
226.25	6KS267	<0.1	<0.3	0.004	<0.03	
226.65	6KS268	<0.1	<0.3	0.004	<0.03	
227.65	6KS269	<0.1	<0.3	0.003	<0.03	
228.5	6KS270	3.65	0.9	0.44	<0.03	
229.5	6KS271	1.75	0.5	0.42	<0.03	P
230.55	6KS272	1.85	<0.3	0.005	<0.03	F
231.55	6KS273	0.44	<0.3	0.003	<0.03	
232.55	6KS274	<0.1	<0.3	0.007	<0.03	
233.55	6KS275	<0.1	<0.3	0.005	<0.03	
234.55	6KS276	<0.1	<0.3	0.007	<0.03	
235.55	6KS277	<0.1	<0.3	0.003	<0.03	
237.0						
240.9	6KS278	<0.1	<0.3	0.04	<0.03	
241.9	6KS279	<0.1	<0.3	0.007	<0.03	
242.8						

GEOLOGIC CORE LOG OF MJKS-11 (6/6) 1/200

MJKS－11 (6／6) 250m ～ 295m

Level 2,804.7 m Direction －
X －178.1m Inclination －90°
Y －445.5m Length 295.0m

LITHO-LOGY	DEPTH (m)	DESCRIPTIONS
	250.9	
	252.3	250.9-252.3m, greenish brown gray beresite altered granite
		252.3-295.0m, csg pink biotite hornblende granite
		csg pink biotite hornblende granite
		csg pink biotite hornblende granite
		csg pink biotite hornblende granite
	295.0	

DEPTH (m)	SAMPLE No.	ASSAY RESULT Au	Ag	Cu	As	LAB. TEST
250.9						
	6KS280	<0.1	<0.3	0.005	<0.03	
252.3						

GEOLOGIC CORE LOG OF MJKS-12 (1/4)

1/200

MJKS-12 (1/4) 0m ~ 50m

Level 2,872.1m Direction -
X -47.4m Inclination -90°
Y -165.3m Length 200.1m

LITHOLOGY	DEPTH (m)	DESCRIPTIONS	DEPTH (m)	SAMPLE No.	ASSAY RESULT Au	Ag	Cu	As	LAB. TEST
		0-7.4m, detritus with pink K-feldspar rich granite pebbles							
	7.4								
		7.4-26.5m, csg pink K-feldspar rich granite, porphyritic							
	26.5								
	27.0	26.5-27.0m, green altered granite, epidotization rich							
		27.0-32.9m, csg pink K-feldspar rich granite							
	32.9								
		32.9-36.3m, mdg green altered granite							
	36.3								
		36.3-38.75m, csg pink K-feldspar rich granite							
	38.75								
		38.75-40.0m, green altered granite							
	40.0								
	40.4	40.0-40.4m, csg pink granite							
	41.0	40.4-41.0m, green altered granite							
		41.0-48.0m, csg pink K-feldspar rich granite							
	48.0								
		48.0-49.5m, green altered granite							
	49.5								
		49.5-51.0m, light white granite							

GEOLOGIC CORE LOG OF MJKS-12 (2/4) 1/200

MJKS-12 (2/4) 50m ~ 100m

Level 2,872.1m Direction -
X -47.4m Inclination -90°
Y -165.3m Length 200.1m

LITHOLOGY	DEPTH (m)	DESCRIPTIONS	DEPTH (m)	SAMPLE No.	ASSAY RESULT Au	Ag	Cu	As	LAB. TEST
	51.0	49.5-51.0m, light white granite							
		51.0-65.5m, green altered granite, epidotization and chloritization, Mn-oxide imp.							
	65.5								
	67.0	65.5-67.0m, cream clay, dry		6KS222					X
		67.0-73.2m, green altered granite							
	73.2	around 72.9m purple fluorite 0.5-3cm							
		73.2-76.5m, green silicified granite, crushed into pebble, additional quartz							
	76.5	76.5-91.5m, green altered granite, epidotization and chloritization							
	91.5	91.5-97.2m, csg pink granite							
	97.2	97.2-103.1m, green altered granite, epidotization and chloritization							
		99.5m, W=0.5cm clay vein (90)							

GEOLOGIC CORE LOG OF MJKS-12 (3/4) 1/200

MJKS－12 (3／4) 100m ～ 150m

Level 2,872.1m Direction －
X －47.4m Inclination －90°
Y －165.3m Length 200.1m

LITHOLOGY	DEPTH (m)	DESCRIPTIONS	DEPTH (m)	SAMPLE No.	ASSAY RESULT Au	Ag	Cu	As	LAB. TEST
		97.2-103.1m, green altered granite, epidotization							
	103.1	103.1-128.0m, csg pink granite							
	128.0	128.0-1128.9m, green altered granite, epidotization							
	128.9	128.9-128.95m, W=5cm cream clay, dry		6KS223					X
	128.95	128.95-132.25m, green altered granite, epidotization							
	132.25	132.25-132.65m, W=0.4m pale cream carbonate vein, clevage developed	132.25	6KS224	5.1	3.0	0.003	<0.03	
	132.65	132.65-135.1m, green altered granite, epidotization	132.65						
	135.1	135.1-139.3m, weak silicified zone in altered granite	135.1	6KS225	9.0	0.4	0.004	<0.03	
	135.3	135.3-170.75m, green altered granite, epidotization	135.3						

GEOLOGIC CORE LOG OF MJKS-12 (4/4) 1/200

MJKS-12 (4/4) 150m ~ 200m

Level 2,872.1m Direction -
X -47.4m Inclination -90°
Y -165.3m Length 200.1m

LITHOLOGY	DEPTH (m)	DESCRIPTIONS	DEPTH (m)	SAMPLE No.	ASSAY RESULT Au	Ag	Cu	As	LAB. TEST
		135.3-170.75m, green altered granite, epidotization							
	170.75	170.75-171.1m, greenish cream clay		6KS226					X
	171.1	171.1-180.0m, green altered granite, crushed							
	180.0	180.0-180.2m, W=0.2m Mn-siderite vein, limonitization	180.0	6KS227	2.7	0.3	0.3	<0.03	P
	180.2	180.2-184.8m, green altered granite	180.2						
	184.8	184.8-184.9m, W=0.1m Mn-siderite vein	184.8	6KS228	2.1	0.3	0.7	<0.03	
	184.9	184.9-200.1m, green altered granite, epidotization	184.9						
	200.1								

APPENDIX. 2

Result of Laboratory Works

Apx. 2-1 Sample List (1)

Sample No.	Locality			Rock name	Laboratory work					Remarks
	Drill hole No.	Depth (m)	Length (m)		T	P	C	X	F	
6KS001	MJKS-1	49.1~50.1	1.0	Greisenizated granite			○			
6KS002	MJKS-1	50.1~51.1	1.0	Greisenizated granite			○			
6KS003	MJKS-1	51.1~51.6	0.5	Greisenizated granite			○			
6KS004	MJKS-1	56.9~57.9	1.0	Greisen			○			
6KS005	MJKS-1	57.9~58.9	1.0	Greisen			○			
6KS006	MJKS-1	58.9~59.9	1.0	Greisen			○			
6KS007	MJKS-1	59.9~60.9	1.0	Greisen	○		○			60.8m(T)
6KS008	MJKS-1	60.9~61.8	0.9	Greisen			○			
6KS009	MJKS-1	61.8~62.3	0.5	Greisen with Mn-siderite network			○			
6KS010	MJKS-1	62.3~62.8	0.5	Quartz Mn-siderite vein		○	○		○	62.35m(F), 62.7m(P)
6KS011	MJKS-1	62.8~63.6	0.8	Greisen			○			
6KS012	MJKS-1	83.3~84.3	1.0	Greisen			○			
6KS013	MJKS-1	84.3~85.3	1.0	Greisen			○			
6KS014	MJKS-1	85.3~86.3	1.0	Greisen			○			
6KS015	MJKS-1	86.3~87.3	1.0	Greisen			○			
6KS016	MJKS-1	87.3~88.3	1.0	Greisen			○			
6KS017	MJKS-1	88.3~89.3	1.0	Greisen			○			
6KS018	MJKS-1	89.3~90.1	0.8	Greisen	○		○			89.7m(T)
6KS019	MJKS-1	90.1~91.15	1.05	Mn-siderite vein		○	○			91.0m(P)
6KS020	MJKS-1	91.15~92.15	1.0	Granite with clay vein			○	○		91.17m(X)
6KS021	MJKS-1	96.2~96.4	0.2	Quartz Mn-siderite vein		○	○		○	96.25m(F), 96.3m(P)
6KS022	MJKS-3	22.8~23.8	1.0	Greisenizated granite porphyry			○			
6KS023	MJKS-3	23.8~24.8	1.0	Greisenizated granite porphyry			○			
6KS024	MJKS-3	24.8~25.8	1.0	Greisenizated granite porphyry			○			
6KS025	MJKS-3	25.8~26.8	1.0	Greisenizated granite porphyry			○			

T: Thin section, P: Polished section, C: Chemical assay analysis,

X: X-ray diffraction analysis, F: Homogenization temperature of fluid inclusion

Apx. 2-1 Sample List (2)

Sample No.	Locality			Rock name	Laboratory work					Remarks
	Drill hole No.	Depth (m)	Length (m)		T	P	C	X	F	
6KS026	MJKS-3	26.8~27.8	1.0	Greisenizated granite porphyry			○			
6KS027	MJKS-3	27.8~28.45	0.7	Greisenizated granite porphyry			○			
6KS028	MJKS-3	31.7~32.7	1.0	Greisen			○			
6KS029	MJKS-3	32.7~33.7	1.0	Greisen			○			
6KS030	MJKS-3	33.7~34.7	1.0	Greisen			○			
6KS031	MJKS-3	34.7~35.7	1.0	Greisen	○		○			35.3m(T)
6KS032	MJKS-3	35.7~36.7	1.0	Greisen			○			
6KS033	MJKS-3	36.7~37.7	1.0	Greisen			○			
6KS034	MJKS-3	37.7~39.1	1.4	Greisen			○			
6KS035	MJKS-3	39.1~39.7	0.6	Greisenizated granite porphyry			○			
6KS036	MJKS-3	71.1~72.1	1.0	Quartz Mn-siderite vein		○	○		○	71.8m(P), 72.0m(F)
6KS037	MJKS-3	72.1~73.1	1.0	Greisen	○		○			72.2m(T)
6KS038	MJKS-3	73.1~74.1	1.0	Greisen			○			
6KS039	MJKS-3	74.1~75.1	1.0	Greisen	○		○			75.0m(T)
6KS040	MJKS-3	75.1~76.1	1.0	Greisen			○			
6KS041	MJKS-3	76.1~77.1	1.0	Greisen			○			
6KS042	MJKS-3	77.1~78.1	1.0	Greisen			○			
6KS043	MJKS-3	78.1~78.95	0.85	Greisen			○			
6KS044	MJKS-3	70.9	0.01	White clay				○		
6KS045	MJKS-1	126.8~127.6	0.8	Gray clay			○	○		126.9m(X)
6KS046	MJKS-3	66.25	0.03	Weak Greisenizated granite	○					
6KS047	MJKS-3	82.9	0.03	Granite porphyry	○					
6KS048	MJKS-3	156.0	0.03	Granite porphyry	○					
6KS049	MJKS-3	166.5~167.65	1.15	Gray clay			○	○		167.0m(X)
6KS050	MJKS-3	240.8	0.03	Granite porphyry	○					

T: Thin section, P: Polished section, C: Chemical assay analysis,

X: X-ray diffraction analysis, F: Homogenization temperature of fluid inclusion

Apx. 2-1 Sample List (3)

Sample No.	Locality			Rock name	Laboratory work					Remarks
	Drill hole No.	Depth (m)	Length (m)		T	P	C	X	F	
6KS051	MJKS-3	242.5～242.68	0.18	Pyrite, chlorite concentrated part		○	○			242.5m(P)
6KS052	MJKS-2	50.4～51.4	1.0	Greisenizated granite			○			
6KS053	MJKS-2	51.4～52.4	1.0	Greisenizated granite			○			
6KS054	MJKS-2	52.4～53.4	1.0	Greisenizated granite			○			
6KS055	MJKS-2	53.4～54.4	1.0	Greisenizated granite			○			
6KS056	MJKS-2	54.4～55.4	1.0	Greisenizated granite			○			
6KS057	MJKS-2	55.4～56.4	1.0	Greisenizated granite			○			
6KS058	MJKS-2	56.4～57.4	1.0	Greisenizated granite			○			
6KS059	MJKS-2	57.4～58.4	1.0	Greisenizated granite	○		○			58.3m(T)
6KS060	MJKS-2	58.4～59.9	1.5	Greisenizated granite			○			
6KS061	MJKS-2	59.9～60.9	1.0	Greisen			○			
6KS062	MJKS-2	60.9～61.9	1.0	Greisen			○			
6KS063	MJKS-2	61.9～62.9	1.0	Greisen			○			
6KS064	MJKS-2	62.9～63.9	1.0	Greisen			○			
6KS065	MJKS-2	63.9～64.9	1.0	Greisen			○			
6KS066	MJKS-2	64.9～65.8	0.9	Greisen			○			
6KS067	MJKS-2	65.8～66.8	1.0	Quartz Mn-siderite vein		○	○			66.3m(P)
6KS068	MJKS-2	66.8～67.8	1.0	Quartz Mn-siderite vein			○		○	67.4m(F)
6KS069	MJKS-2	67.8～68.1	0.3	Quartz Mn-siderite vein		○	○			67.9m(P)
6KS070	MJKS-2	68.1～69.1	1.0	Greisen			○			
6KS071	MJKS-2	69.1～70.45	1.35	Greisen	○		○			69.2m(T)
6KS072	MJKS-2	70.45～71.1	0.65	Quartz Mn-siderite vein		○	○		○	70.7m(F), 70.9m(P)
6KS073	MJKS-2	71.1～72.1	1.0	Quartz Mn-siderite vein			○			
6KS074	MJKS-2	72.1～73.1	1.0	Quartz Mn-siderite vein			○			
6KS075	MJKS-2	73.1～74.1	1.0	Quartz Mn-siderite vein			○			

T: Thin section, P: Polished section, C: Chemical assay analysis,

X: X-ray diffraction analysis, F: Homogenization temperature of fluid inclusion

Apx. 2-1 Sample List (4)

Sample No.	Locality			Rock name	Laboratory work					Remarks
	Drill hole No.	Depth (m)	Length (m)		T	P	C	X	F	
6KS076	MJKS-2	74.1～74.95	0.85	Quartz Mn-siderite vein		◎	○			a:74.9m(P), b:74.3m(P)
6KS077	MJKS-2	74.95～75.1	0.15	Greisen			○			
6KS078	MJKS-2	75.1～75.35	0.25	Clay with Mn-siderite veinlet			○	○		75.2m(X)
6KS079	MJKS-2	75.35～76.35	1.0	Altered granite			○			
6KS080	MJKS-4	30.45～31.12	0.67	Altered granite			○			
6KS081	MJKS-4	31.12～31.16	0.04	Quartz Mn-siderite vein		○	○		○	31.14m(P,F)
6KS082	MJKS-4	31.16～31.9	0.74	Altered granite			○			
6KS083	MJKS-4	36.5～37.5	1.0	Greisen			○			
6KS084	MJKS-4	37.5～38.5	1.0	Greisen			○			
6KS085	MJKS-4	38.5～39.5	1.0	Greisen			○			
6KS086	MJKS-4	39.5～40.5	1.0	Greisen			○			
6KS087	MJKS-4	40.5～41.5	1.0	Greisen			○			
6KS088	MJKS-4	41.5～42.5	1.0	Greisen			○			
6KS089	MJKS-4	42.5～43.5	1.0	Greisen			○			
6KS090	MJKS-4	43.5～44.5	1.0	Greisen			○			
6KS091	MJKS-4	44.5～45.5	1.0	Greisen			○			
6KS092	MJKS-4	45.5～46.5	1.0	Greisen			○			
6KS093	MJKS-4	46.5～47.5	1.0	Greisen			○			
6KS094	MJKS-4	47.5～48.0	0.5	Greisen			○			
6KS095	MJKS-4	96.2～96.75	0.55	Aplite	○		○			96.4m(T)
6KS096	MJKS-4	96.75～97.75	1.0	Greisen			○			
6KS097	MJKS-4	97.75～98.75	1.0	Greisen			○			
6KS098	MJKS-4	98.75～99.75	1.0	Greisen			○			
6KS099	MJKS-4	99.75～100.75	1.0	Greisen			○			
6KS100	MJKS-4	100.75～101.75	1.0	Greisen			○			

T: Thin section, P: Polished section, C: Chemical assay analysis.

X: X-ray diffraction analysis, F: Homogenization temperature of fluid inclusion

Apx. 2-1 Sample List (5)

Sample No.	Locality			Rock name	Laboratory work					Remarks
	Drill hole No.	Depth (m)	Length (m)		T	P	C	X	F	
6KS101	MJKS-4	101.75～102.75	1.0	Greisen			○			
6KS102	MJKS-4	102.75～103.75	1.0	Greisen			○			
6KS103	MJKS-4	103.75～105.0	1.25	Greisen			○			
6KS104	MJKS-4	105.0～105.15	0.15	Quartz Mn-siderite vein			○			
6KS105	MJKS-4	105.15～105.3	0.15	Greisen			○			
6KS106	MJKS-4	105.3～106.3	1.0	Quartz Mn-siderite vein		○	○		○	106.2(P,X)
6KS107	MJKS-4	106.3～106.8	0.5	Greisen with Mn-siderite vein			○			
6KS108	MJKS-4	106.8～107.8	1.0	Greisen			○			
6KS109	MJKS-4	107.8～108.8	1.0	Greisen			○			
6KS110	MJKS-4	108.8～109.8	1.0	Greisen	○		○			109.7m(T)
6KS111	MJKS-4	109.8～110.5	0.7	Greisen			○			
6KS112	MJKS-4	110.5～111.5	1.0	Greisenizated granite			○			
6KS113	MJKS-4	111.5～111.8	0.3	Mn-siderite vein		○	○			111.7m(P)
6KS114	MJKS-4	111.8～112.8	1.0	Greisenizated granite			○			
6KS115	MJKS-4	112.8～113.8	1.0	Greisenizated granite			○			
6KS116	MJKS-4	113.8～114.8	1.0	Greisenizated granite			○			
6KS117	MJKS-4	114.8～115.9	1.1	Greisenizated granite			○			
6KS118	MJKS-2	133.5	0.03	Pink granite	○					
6KS119	MJKS-4	48.1	0.01	Clay				○		
6KS120	MJKS-4	55.4	0.01	Clay				○		
6KS121	MJKS-4	63.2	0.03	Aplite	○					
6KS122	MJKS-2	176.1	0.03	Carbonate quartz vein			○			176.1m(P)
6KS123	MJKS-5 site	outcrop	0.1	Mn-siderite vein			○			N18°E,55°NW
6KS124	MJKS-5 site	outcrop	0.04	Mn-siderite vein			○			N35°E,35°NW
6KS125	MJKS-3	95.2	0.03	Granite porphyry with malachite						95.2m(P)

T: Thin section, P: Polished section, C: Chemical assay analysis,

X: X-ray diffraction analysis, F: Homogenization temperature of fluid inclusion

Apx. 2-1 Sample List (6)

Sample No.	Locality			Rock name	Laboratory work					Remarks
	Drill hole No.	Depth (m)	Length (m)		T	P	C	X	F	
6KS126	MJKS-5	23.2～24.3	1.1	Greizenizatied granite	○		○			23.6m(T)
6KS127	MJKS-5	24.45～25.1	0.65	Greizenizatied granite			○			
6KS128	MJKS-5	113.8～114.9	1.1	Silicified altered granite			○			
6KS129	MJKS-5	122.1～122.9	0.8	Silicified altered granite			○			
6KS130	MJKS-5	122.9～122.98	0.08	Quartz Mn-siderite vein		○	○			122.95m(P)
6KS131	MJKS-5	122.98～123.3	0.32	Silicified altered granite with qtz vein			○		○	123.3m(F)
6KS132	MJKS-5	141.5～142.5	1.0	Altered granite	○		○			142.2m(T)
6KS133	MJKS-5	142.5～143.5	1.0	Quartz Mn-siderite vein		○	○		○	142.8m(P,F)
6KS134	MJKS-5	143.5～144.5	1.0	Mn-siderite vein		○	○			144.3m(P)
6KS135	MJKS-5	144.5～145.1	0.6	Mn-siderite vein			○			
6KS136	MJKS-5	145.1～146.1	1.0	Altered granite			○			
6KS137	MJKS-6	130.6～131.6	1.0	Altered granite			○			
6KS138	MJKS-6	131.6～132.6	1.0	Altered granite	○		○			132.1m(T)
6KS139	MJKS-6	132.6～133.9	1.3	Altered granite			○			
6KS140	MJKS-6	133.9～134.9	1.0	Quartz Mn-siderite vein		○	○		○	134.7(P,F)
6KS141	MJKS-6	134.9～135.9	1.0	Quartz Mn-siderite vein		○	○			135.6m(P)
6KS142	MJKS-6	135.9～136.9	1.0	Quartz Mn-siderite vein			○			
6KS143	MJKS-6	136.9～137.9	1.0	Quartz Mn-siderite vein			○			
6KS144	MJKS-6	137.9～138.9	1.0	Quartz Mn-siderite vein		○	○			138.4m(P)
6KS145	MJKS-6	138.9～139.9	1.0	Quartz Mn-siderite vein		○	○		○	139.2m(P,F)
6KS146	MJKS-6	139.9～140.9	1.0	Mn-siderite vein			○			
6KS147	MJKS-6	140.9～141.9	1.0	Mn-siderite vein			○			
6KS148	MJKS-6	141.9～142.9	1.0	Mn-siderite vein		○	○			142.1m(P)
6KS149	MJKS-6	142.9～143.9	1.0	Mn-siderite vein			○			
6KS150	MJKS-6	143.9～144.9	1.0	Mn-siderite vein			○			

T: Thin section, P: Polished section, C: Chemical assay analysis.

X: X-ray diffraction analysis, F: Homogenization temperature of fluid inclusion

Apx. 2-1 Sample List (7)

Sample No.	Locality			Rock name	Laboratory work					Remarks
	Drill hole No.	Depth (m)	Length (m)		T	P	C	X	F	
6KS151	MJKS-6	144.9～145.2	0.3	Mn-siderite vein			○			
6KS152	MJKS-6	145.2～146.2	1.0	Altered granite			○			
6KS153	MJKS-6	146.7	0.03	Altered granite	○					
6KS154	MJKS-6	158.4	0.01	Brown clay				○		
6KS155	MJKS-6	96.9	0.01	Brownish gray clay				○		
6KS156	MJKS-5	147.3	0.03	Altered granite	○					
6KS157	MJKS-5	24.4	0.01	Grayish brown clay				○		
6KS158	MJKS-5	77.5	0.01	White clay				○		
6KS159	MJKS-6	4.0	0.01	Olive gray clay				○		
6KS160	MJKS-3	60.4	0.01	Greenish cream clay				○		
6KS161	MJKS-4	75.4	0.01	Gray clay				○		
6KS162	MJKS-4	83.0	0.01	Gray clay				○		
6KS163	MJKS-1	35.8	0.01	Cream yellow clay				○		
6KS164	MJKS-5	100.3	0.01	Brown gray clay				○		
6KS165	MJKS-5	109.45	0.01	White clay				○		
6KS166	MJKS-7	112.5～113.5	1.0	Greisen			○			
6KS167	MJKS-7	113.5～114.5	1.0	Greisen			○			
6KS168	MJKS-7	114.5～115.5	1.0	Greisen			○			
6KS169	MJKS-7	115.5～116.8	1.3	Greisen			○			
6KS170	MJKS-7	116.8～117.8	1.0	Quartz Mn-siderite vein			○		○	116.85m(F)
6KS171	MJKS-7	117.8～118.8	1.0	Quartz Mn-siderite vein			○			
6KS172	MJKS-7	118.8～119.3	0.5	Quartz Mn-siderite vein		○	○			118.85m(P)
6KS173	MJKS-7	119.3～120.3	1.0	Greisen with clay			○	○		119.5m(X)
6KS174	MJKS-7	120.3～121.3	1.0	Greisen with clay			○			
6KS175	MJKS-7	121.3～122.3	1.0	Greisen with clay			○			

T: Thin section, P: Polished section, C: Chemical assay analysis,

X: X-ray diffraction analysis, F: Homogenization temperature of fluid inclusion

Apx. 2-1 Sample List (8)

Sample No.	Locality			Rock name	Laboratory work					Remarks
	Drill hole No.	Depth (m)	Length (m)		T	P	C	X	F	
6KS176	MJKS-7	122.3~123.3	1.0	Greisen with clay			○			
6KS177	MJKS-7	123.3~123.38	0.08	Quartz Mn-siderite vein			○			
6KS178	MJKS-7	123.38~124.4	1.02	Greisem			○			
6KS179	MJKS-7	124.4~125.8	1.4	Greisen			○			
6KS180	MJKS-9	91.5~92.5	1.0	Greisen			○			
6KS181	MJKS-9	92.5~93.5	1.0	Greisen			○			
6KS182	MJKS-9	93.5~94.5	1.0	Greisen			○			
6KS183	MJKS-9	94.5~95.5	1.0	Greisen			○			
6KS184	MJKS-9	95.5~96.5	1.0	Greisen			○			
6KS185	MJKS-9	96.5~97.5	1.0	Greisen			○			
6KS186	MJKS-9	97.5~98.5	1.0	Greisen			○			
6KS187	MJKS-9	98.5~99.5	1.0	Greisen			○			
6KS188	MJKS-9	99.5~100.5	1.0	Greisen			○			
6KS189	MJKS-9	100.5~101.5	1.0	Greisen			○			
6KS190	MJKS-9	101.5~102.5	1.0	Greisen			○			
6KS191	MJKS-9	102.5~103.5	1.0	Greisen			○			
6KS192	MJKS-9	103.5~104.5	1.0	Greisen			○			
6KS193	MJKS-9	104.5~105.85	1.35	Greisen			○			
6KS194	MJKS-9	105.85~106.85	1.0	Quartz Mn-siderite vein			○		○	105.9m(F)
6KS195	MJKS-9	106.85~107.85	1.0	Quartz Mn-siderite vein		○	○			107.5m(P)
6KS196	MJKS-9	107.85~108.85	1.0	Quartz Mn-siderite vein			○			
6KS197	MJKS-9	108.85~109.65	0.8	Quartz Mn-siderite vein			○			
6KS198	MJKS-9	109.75~110.75	1.0	Greisen			○			
6KS199	MJKS-9	110.75~111.75	1.0	Greisen			○			
6KS200	MJKS-9	111.75~112.75	1.0	Greisen			○			

T: Thin section, P: Polished section, C: Chemical assay analysis,

X: X-ray diffraction analysis, F: Homogenization temperature of fluid inclusion

Apx. 2-1 Sample List (9)

Sample No.	Locality			Rock name	Laboratory work					Remarks
	Drill hole No.	Depth (m)	Length (m)		T	P	C	X	F	
6KS201	MJKS-9	112.75～113.75	1.0	Greisen			○			
6KS202	MJKS-9	113.75～115.0	1.25	Greisen			○			
6KS203	MJKS-9	109.7	0.01	Cream clay				○		
6KS204	Trench K-120	outcrop	2.4	Quartz vein with greisen			○			
6KS205	Trench K-110	outcrop	3.3	Quartz network vein with greisen			○			
6KS206	MJKS-8	36.5～37.5	1.0	Greisen			○			
6KS207	MJKS-8	37.5～38.5	1.0	Greisen			○			
6KS208	MJKS-8	38.5～39.5	1.0	Greisen			○			
6KS209	MJKS-8	39.5～40.5	1.0	Greisen			○			
6KS210	MJKS-8	40.5～41.6	1.1	Greisen			○			
6KS211	MJKS-8	131.8～132.8	1.0	Greisen			○			
6KS212	MJKS-8	132.8～133.8	1.0	Greisen			○			
6KS213	MJKS-8	133.8～134.8	1.0	Greisen			○			
6KS214	MJKS-8	134.8～135.8	1.0	Greisen			○			
6KS215	MJKS-8	135.8～137.0	1.2	Greisen			○			
6KS216	MJKS-8	137.0～137.5	0.5	Silicified greisen			○			
6KS217	MJKS-8	137.8～138.8	1.0	Greisen			○			
6KS218	MJKS-8	138.8～139.8	1.0	Greisen			○			
6KS219	MJKS-8	139.8～140.7	0.9	Greisen			○			
6KS220	MJKS-8	137.7	0.01	Cream clay				○		
6KS221	MJKS-8	36.4	0.01	Cream clay				○		
6KS222	MJKS-12	66.2	0.01	Cream clay				○		
6KS223	MJKS-12	128.93	0.01	Cream clay				○		
6KS224	MJKS-12	132.25～132.65	0.4	Calcite vein			○			
6KS225	MJKS-12	135.1～135.3	0.2	Silicified zone in altered granite			○			

T: Thin section, P: Polished section, C: Chemical assay analysis,

X: X-ray diffraction analysis, F: Homogenization temperature of fluid inclusion

Apx. 2-1 Sample List (10)

Sample No.	Locality			Rock name	Laboratory work					Remarks
	Drill hole No.	Depth (m)	Length (m)		T	P	C	X	F	
6KS226	MJKS-12	170.9	0.01	Greenish cream clay				○		
6KS227	MJKS-12	180.0～180.2	0.2	Mn-siderite vein		○	○			180.1m(P)
6KS228	MJKS-12	184.8～184.9	0.1	Mn-siderite vein			○			
6KS229	MJKS-11	58.5	0.01	Cream clay				○		
6KS230	MJKS-10	144.8	0.01	Black brown clay				○		
6KS231	MJKS-10	175.6	0.01	Cream clay				○		
6KS232	MJKS-10	187.3～187.5	0.2	Calcite vein			○			
6KS233	MJKS-10	194.0～194.05	0.05	Quartz veinlet			○		○	194.0m(F)
6KS234	MJKS-11	185.2～186.2	1.0	Altered granite			○			
6KS235	MJKS-11	186.2～187.2	1.0	Altered granite			○			
6KS236	MJKS-11	187.2～188.2	1.0	Altered granite			○			
6KS237	MJKS-11	188.2～189.2	1.0	Altered granite			○			
6KS238	MJKS-11	189.2～190.2	1.0	Altered granite			○			
6KS239	MJKS-11	190.2～191.2	1.0	Altered granite			○			
6KS240	MJKS-11	191.2～192.2	1.0	Altered granite			○			
6KS241	MJKS-11	192.2～193.2	1.0	Altered granite			○			
6KS242	MJKS-11	193.2～193.9	0.7	Altered granite			○			
6KS243	MJKS-11	198.15～199.15	1.0	Altered granite			○			
6KS244	MJKS-11	199.15～200.0	0.85	Altered granite			○			
6KS245	MJKS-11	203.7～204.0	0.30	Altered granite			○			
6KS246	MJKS-11	204.0～204.15	0.15	Altered granite with Mn-siderite veinlet			○			
6KS247	MJKS-11	204.15～205.2	1.05	Altered granite			○			
6KS248	MJKS-11	205.2～206.2	1.0	Altered granite			○			
6KS249	MJKS-11	208.1～209.1	1.0	Altered granite			○			
6KS250	MJKS-11	209.1～210.15	1.05	Altered granite			○			

T: Thin section, P: Polished section, C: Chemical assay analysis,

X: X-ray diffraction analysis, F: Homogenization temperature of fluid inclusion

Apx. 2-1 Sample List (11)

Sample No.	Locality			Rock name	Laboratory work					Remarks
	Drill hole No.	Depth (m)	Length (m)		T	P	C	X	F	
6KS251	MJKS-11	210.15~210.6	0.45	Mn-siderite vein			○			210.4m(P)
6KS252	MJKS-11	210.6~211.6	1.0	Altered granite			○			
6KS253	MJKS-11	211.6~212.6	1.0	Altered granite			○			
6KS254	MJKS-11	212.6~213.6	1.0	Altered granite			○			
6KS255	MJKS-11	213.6~214.6	1.0	Altered granite			○			
6KS256	MJKS-11	214.6~215.6	1.0	Altered ranite			○			
6KS257	MJKS-11	215.6~216.8	1.2	Altered granite			○			
6KS258	MJKS-11	217.3	0.01	Cream gray clay				○		
6KS259	MJKS-11	217.5~218.5	1.0	Altered granite			○			
6KS260	MJKS-11	218.5~219.5	1.0	Altered granite			○			
6KS261	MJKS-11	219.5~220.5	1.0	Altered granite			○			
6KS262	MJKS-11	220.5~221.5	1.0	Altered granite			○			
6KS263	MJKS-11	221.5~222.5	1.0	Altered granite			○			
6KS264	MJKS-11	222.5~223.5	1.0	Altered granite			○			
6KS265	MJKS-11	223.5~224.5	1.0	Altered granite			○			
6KS266	MJKS-11	224.5~225.5	1.0	Altered granite			○			
6KS267	MJKS-11	225.5~226.25	0.75	Altered granite			○			
6KS268	MJKS-11	226.65~227.65	1.0	Altered granite			○			
6KS269	MJKS-11	227.65~228.5	0.85	Altered granite			○			
6KS270	MJKS-11	228.5~229.5	1.0	Quartz Mn-siderite vein			○			
6KS271	MJKS-11	229.5~230.55	1.05	Quartz Mn-siderite vein		○	○		○	229.8m(P), 230.2m(F)
6KS272	MJKS-11	230.55~231.55	1.0	Altered granite			○			
6KS273	MJKS-11	231.55~232.55	1.0	Altered granite			○			
6KS274	MJKS-11	232.55~233.55	1.0	Altered granite			○			
6KS275	MJKS-11	233.55~234.55	1.0	Altered granite			○			

T: Thin section, P: Polished section, C: Chemical assay analysis,

X: X-ray diffraction analysis, F: Homogenization temperature of fluid inclusion

Apx. 2-1 Sample List (12)

Sample No.	Locality			Rock name	Laboratory work					Remarks
	Drill hole No.	Depth (m)	Length (m)		T	P	C	X	F	
6KS276	MJKS-11	234.55～235.55	1.0	Altered granite			○			
6KS277	MJKS-11	235.55～237.0	1.45	Altered granite			○			
6KS278	MJKS-11	240.9～241.9	1.0	Altered granite			○			
6KS279	MJKS-11	241.9～242.8	0.9	Altered granite			○			
6KS280	MJKS-11	250.9～252.3	1.4	Altered granite			○			

T: Thin section, P: Polished section, C: Chemical assay analysis,

X: X-ray diffraction analysis, F: Homogenization temperature of fluid inclusion

Apx. 2-2 Result of Microscopic Observation of Thin Sections

No.	Sample No.	Drill hole No.	Depth (m)	Rock name	Primary minerals											Secondary minerals															
				Minerals	Quartz	K-feldspar	Plagioclase	Biotite	Muscovite	Amphibole	Tourmaline	Rutile	Apatite	Sphene	Beryl	Zircon	Quartz	Muscovite	Lithia mica	Calcite	Barite	Actinolite	Epidote	Zoisite	Orthite	Fluorite	Rutile	Chlorite	Cassiterite	Ore mineral	Pyrite	Limonite	Leucoxene	Hydrous ferric oxides
1	6KS007	MJKS-1	60.8	Greisen	○							·	·		·		○	○	△	·	·								·				
2	6KS018	MJKS-1	89.7	Greisen	△										·		○	○	△	·	·								·				
3	6KS059	MJKS-2	58.2	Greisenizated alaskitic granite	○	○		△		△	·			·		·	○	○	△					·					·				·
4	6KS071	MJKS-2	69.2	Greisen	△										·		○	○	△	·						·		·					
5	6KS118	MJKS-2	133.5	Muscovite granite	○	○	○		△																								
6	6KS031	MJKS-3	35.3	Greisenizated granodiorite	○	○	○				·	·		·	·		○	○	△	·	·												
7	6KS037	MJKS-3	72.2	Greisen	△										·		○	○	△										·				
8	6KS039	MJKS-3	75.0	Greisenizated granodiorite	○	○	○						·		·		○	○						·					·	·			
9	6KS046	MJKS-3	66.25	Greisenizated leucocratic granite	○	○	△								·			○	△	·									·				
10	6KS047	MJKS-3	82.9	Greisenizated leucocratic granite porphyry	○	○	○								·	·		△	△	·				·	·				·				
11	6KS048	MJKS-3	156.0	Leucocratic granite porphyry	○	○	○							·				△		·									·				
12	6KS050	MJKS-3	240.8	Leucocratic granite porphyry	○	○	○		·					·						·					·				·				
13	6KS121	MJKS-4	63.2	Aplite	○	○	○		△																								
14	6KS095	MJKS-4	96.4	Aplite	○	○	○		△																								
15	6KS110	MJKS-4	109.7	Greisen	○									·	·		○	○	△	·	·				·			·	·				·
16	6KS126	MJKS-5	23.6	Greisenizated granite	△	△	△					·	·		·		○	○											△				△
17	6KS132	MJKS-5	142.2	Beresitizated granite	○	○	○						·				○	○		△							·		·	·			·
18	6KS156	MJKS-5	147.3	Beresitizated granite	○	○	○						·			·	○	○											·	·	·		
19	6KS138	MJKS-6	132.1	Beresitizated granite	○	○	○						·				○	○		·		·	·	·		·	·		·		·	·	
20	6KS153	MJKS-6	146.7	Beresitizated granite	○	○	○										○	○		△									·		·	·	

◎ : Abundant (>50%) ○ : Common (50–20%) △ : Poor (20–5%) · : Rare (<5%)

Description of Microscopic Observation of Thin Section

1. THIN SECTION 6KS007

Rock Name: Greisen

Texture: Glomeroblastic, lepidogranoblastic

Composition: Quartz 52%, colorless mica 40%, beryl 1-3%, calcite, barite 4%, ore mineral 2%, rutile, apatite.

Quartz is observed in the form of more or less equidimensional grains measuring 0.4-0.7mm and having weakly sinuous boundaries.

Beryl is observed in the form of irregular grains and is distributed in interstitial between the grains of quartz; it is colorless and of negative elongation, Ng - Np = 0.004-0.006, uniaxial, negative.

Colorless mica is represented by muscovite and lithia mica-zinnwaldite? Muscovite is flaky, foliated-flaky, columnar and of straight extinction, Ng - Np = 0.040-0.045, positive elongation. Thin-flaky sericite, zinnwaldite? (lithia mica) is also observed. It is radial, colorless and sometimes of yellow-brown color and forms fan-like accumulations, Ng - Np = 0.032-0.030. Its content makes up from 3 to 4%.

Ore mineral is observed in the form of accumulations of grains of irregular form measuring 0.01-0.1mm and also in the form of thin veinlet along the fractures.

Needle-shaped rutile and apatite are also observed. Mica is found not only in the form of large grains but also in the form of accumulations of small flakes. The presence of monomineral small-grained accumulations and also of groups of large quartz grains characterizes the structure as glomeroblastic.

2. THIN SECTION 6KS018

Rock Name: Greisen

Texture: Lepidogranoblastic, dented.

Composition: Quartz 53%, colorless mica (muscovite and zinnwaldite?) 40%, beryl 1-3%, barite, calcite 1-3%, ore mineral 1%.

Quartz is observed in the form of sutured grains measuring from 0.3 to 0.5mm.

Beryl grains, measuring from 0.2 to 0.3mm, are of irregular form, colorless, Ng - Np = 0.004, uniaxial, negative. Beryl is accompanied by

quartz.

Micas are colorless. Muscovite is columnar, tabular, sometimes has dented boundaries. Ng - Np = 0.045-0.050. positive elongation. Thin-flaky muscovite-sericite is observed in the form of accumulations, often with the presence of lithia mica, the content of which makes up 1%. Lithia mica is most likely to be zinnwaldite. It is characterized by more lower value of Ng - Np = 0.030-0.032 in comparison to muscovite. It can not be excluded that lithia mica is referred to the series of lepidolite. Detailed data of the chemical analysis are needed to distinguish between them.

Ore mineral is observed in the form of thin dissemination.

3. THIN SECTION 6KS059

Rock Name: Greisenizated alaskitic granite

Texture: Granitic, lepidoblastic

Composition: Quartz 33-35%, common potash feldspar 35%, colorless mica 25%, biotite, amphibole 5%, tourmaline - isolated grains, ore mineral, hydrous ferric oxides 2%, sphene, zoisite - isolated grains, zircon - isolated grains.

Quartz and common potash feldspars are observed in the shape of equidimensional grains with weakly sinuous boundaries measuring from 0.4-0.6 to 1.1mm.

Common potash feldspars are represented by highly pelitizated microcline and microcline-microperthite.

Dark-colored brown biotite with short scales and pseudomorphically replaced hornblende. The latter is replaced by brown hydrous ferric oxides.

Colorless mica is represented by muscovite and lithia mica (lepidolite?). Muscovite is observed in the shape of scaly columnar grains and fan-like accumulations. It is colorless (Ng - Np = 0.054). Lithia mica is thin-scaly and it forms mosaic accumulations, (Ng - Np = 0.028-0.030). Micas are observed all together and fill intergranular interstitial.

Ore mineral is observed as solid thin-grained masses, hydrous ferric oxides associate with amphibole. All the rest of the minerals are accessory.

4. THIN SECTION 6KS071

Rock Name: Greisen

Texture: Granolepidoblastic

Composition: Quartz 53%, colorless micas 44-45%, beryl 1%, fluorite, chlorite - isolated grains, calcite 2%.

Feldspars are replaced by quartz and colorless micas. As a result, they have the form of relic grains of irregular shape.

Quartz is observed as grains of irregular shape with dented boundaries measuring 0.2-0.4mm.

Mica forms thin-scaly masses. Muscovite of gently green color predominates (Ng - Np = 0.050-0.054). Lithia mica (lepidolite?) has still thinner scales. It is colorless, (Ng -Np = 0.028).

Isolated grains of beryl, fluorite, thin-scaly chlorite and calcite are observed among scaly mica aggregates. Calcite is thin-grained and has the shape of accumulations contaminated by clayey material.

5. THIN SECTION 6KS118

Rock Name: Muscovite granite

Texture: Hypidiomorphic, granitic

Composition: Quartz 30%, common potash feldspars 30%, plagioclase 35%, muscovite 5%.

Quartz is observed in the shape of xenomorphic grains measuring up to 2.5mm in diameter. It is somewhat jointly, and is everywhere of cloudy extinction.

Common potash feldspar is observed as grains of irregular shape and very often it even does not form its own grains, but covers plagioclase. Common potash feldspar is intensively pelitizated; in the places, where its grains have not been touched by secondary alterations, it refers to microcline-microperthite.

Plagioclase is represented in the shape of idiomorphic prismatic grains and by its composition is referred to oligoclase, it is very rarely pelitizated. Sometimes, perthitic microcline absorbs and replaces adjacent grains of oligoclase, which are kept within it in the form of relics.

6. THIN SECTION 6KS031

Rock Name: Greisenizated granodiorite

Texture: Hypidiomorphic-granular, lepidogranoblastic

Composition: Quartz 20%, feldspars (plagioclase 30%, microcline 20%), colorless mica 24%, beryl 2%, barite 1-2%, calcite 2%, rutile,

tourmaline, sphene - isolated grains.

Plagioclase forms prismatic grains, the composition of which meets oligoclase; they are partially replaced by aggregate of fine-grained quartz and thin-flaky muscovite (as a result of greisenization). Common potash feldspar is non-latticed microcline, partially pelitizated. The dimensions of the grains are 0.4-0.6mm. Xenomorphic quartz occurs in interstitial between the grains of feldspars.

Colorless mica is muscovite and lithia mica (series of lepidolite?). Muscovite forms thin flakes, columnar and rod-like separations combined into radiate aggregates. They are of high double-refraction, Ng - Np = 0.045-0.050.

Lithia mica (1%) is observed in the form of small flaky grains, Ng - Np = 0.030-0.034. Xenogenetic minerals are calcite and barite. Accessory minerals, ore mineral, tourmaline, sphene, are observed in isolated grains.

7. THIN SECTION 6KS037

Rock Name: Greisen

Texture: Glomeroblastic, lepidogranoblastic

Composition: Quartz 45-52%, beryl 1-3%, colorless mica 35%, ore mineral 3%.

Quartz is observed in the form of irregular grains measuring 0.3-0.5mm and has cloudy extinction in all parts.

In interstitials between the grains small quantities of beryl are observed. Having no its own boundaries it forms grains of irregular form and is often associated with mica. Beryl is colorless, uniaxial, negative, Ng - Np = 0.004.

Out of micas, muscovite predominates. It is colorless and is observed in the form of flaky (sometimes columnar and rod-like) grains, Ng - Np = 0.045. Lithia mica is observed in small quantities (5-10%), Ng - Np = 0.030. Micas form accumulations and rosettes.

Ore mineral is associated with them and, in its turn, forms accumulations of small grains in the mass of mica.

8. THINSECTION 6KS039

Rock Name: Greisenizated granodiorite

Texture: Hypidiomorphic-granular, lepidogranoblastic

Composition: Quartz 20%, plagioclase 27%, microcline 25%, colorless mica 25%, beryl 2%, ore mineral 1%, apatite, orthite - isolated grains.

Plagioclase forms prismatic grains (of 0.5mm in length) replaced by colorless mica. Common potash feldspar is represented by non-latticed microcline and microcline-microperthite, it is observed in the form of grains of irregular shape measuring 0.4-0.5mm. In interstitials between the grains of quartz and common potash feldspar, beryl is observed (colorless, uniaxial, negative, Ng - Np = 0.004).

Mica is observed in the form of long colorless flakes, Ng -Np = 0.045-0.050. It is obviously muscovite. Quartz and muscovite form accumulations of small grains in the rock. These aggregates replace the grains of plagioclase of greisenizated primary rock.

Ore mineral is observed in the form of thin scattered dissemination. It is weakly limonitizated. Orthite and apatite are accessory.

9. THIN SECTION 6KS046

Rock Name: Greisenizated leucocratic alkaline-feldspar granite

Texture: Granitic, porphyritic

Composition: Quartz 30%, common potash feldspar 35%, plagioclase 10%, colorless micas 20%, calcite 5%, beryl - isolated grains, ore mineral - isolated grains.

Common potash feldspar is represented by non-latticed microcline and microcline-microperthite. They are observed in the form of grains of irregular (sometimes of tabular) shape, dimensions 0.8-1.2mm. Perthites of albite are banded and spotted (mesoperthites). Common potash feldspars are pelitizated. It is mainly characteristic of microcline-microperthite.

Plagioclase is observed in the form of elongated prismatic grains, it does not form polysynthetic twins. At the contact with common potash feldspars it forms albite rim.

Quartz is xenomorphic, 0.5-1mm.

Mica fills the space between grains of quartz and grains of common potash feldspar. Flaky muscovite in the form of fan (Ng - Np = 0.040-0.045) and thin-flaky lithia mica (Ng - Np = 0.030-0.032) are observed. Lithia mica forms lens-shaped accumulations and is accompanied by isolated small grains of calcite and beryl of irregular shape (Ng - Np = 0.004).

10. THIN SECTION 6KS047

Rock Name: Weakly Greisenizated leucocratic granite porphyry

Texture: Porphyritic, aplitic groundmass

Composition: Quartz 25%, common potash feldspar 33-38%, plagioclase 25%, colorless mica 10- 15%, calcite 2%, beryl - isolated grains, zircon - one grain, zoisite, orthite.

Phenocrysts are represented by large (up to 1.5-2.0mm in diameter), rounded grains of quartz, which have no idiomorphic boundaries, by plates of partially albitizated microcline - microperthite and sour plagioclase (oligoclase).

The groundmass is holocrystalline and is composed of subdiomorphic grains of quartz, common potash feldspar and plagioclase. The dimension of grains is 0.3-0.4mm. In the groundmass neogenesises of fan-shaped accumulations of muscovite and those of lithia mica (thin flakes) are observed.

Micas differ from each other in double-refraction and in the form of separation. Ng - Np of muscovite is up to 0.048, and that of lithia mica - 0.032. Among micas isolated grains of beryl (0.3mm, Ng - Np = 0.004) and also calcite and isolated grains of ore mineral are observed.

11. THIN SECTION 6KS048

Rock name: Leucocratic granite porphyry with traces of greisenization

Texture: Porphyritic, aplitic groundmass

Composition: Quartz 25%, common potash feldspar 40%, plagioclase 30%, colorless mica (muscovite) 5-7%, ore minerals, calcite, sphene - isolated grains.

Phenocrysts are indistinct and are represented by plates of plagioclase (oligoclase) with sour outer rim and are replaced by mica in the central part. Phenocrysts of pelitizated common potash feldspar (microcline-microperthite) are more rarely observed. The diameter of impregnations - 1.2-2.0mm. Rounded grains of quartz are observed as isolated impregnations.

The groundmass is holocrystalline, fine-grained and is composed of the same minerals with nearly equal idiomorphism.

Insignificant quantities of muscovite neogenesises are observed in the

form of small flakes and fan-shaped separations. Ore mineral is observed to associate with mica. Calcite and sphene - isolated grains.

12. THIN SECTION 6KS050

Rock Name: Leucocratic granite porphyry

Texture: Porphyritic, aplitic groundmass

Composition: Quartz 30%, common potash feldspar - plagioclase 25%, muscovite 3%, ore mineral, sphene, calcite, orthite - one grain.

Large phenocrysts (1.5-2.0mm) belong to sericitizated plagioclase (oligoclase) and to weakly albitizated microcline-microperthite, isolated impregnation are composed of quartz.

Groundmass is composed of small grains (0.3-0.4mm) of quartz and feldspars which are of nearly equal idiomorphism. Also observed are thin plates of muscovite of different orientation, isolated small impregnations of ore mineral, calcite, small isolated grains of sphene and orthite (0.1-0.2mm).

13. THIN SECTION 6KS121

Rock Name: Aplite

Texture: Aplitic, micrographic

Composition: Quartz 30%, plagioclase 35%, common potash feldspars 30%, muscovite 5%.

All the grains of felsic minerals are of 0.2-0.3mm in diameter and are of approximately equal degree of idiomorphism.

In some areas of the thin section quartz is more idiomorphic in comparison to feldspars. Plagioclase is almost entirely replaced by thin-scaly sericite. Only isolated grains are of twinned composition. The composition of plagioclase is referred to albite-oligoclase.

Common potash feldspar is a pelitizated microcline, some of its grains have strongly pronounced microclinic lattice. Areas, where common potash feldspar is penetrated by ichthyoglyptes of quartz, are observed.

Muscovite is observed in the shape of scaly grains, which are sometimes take the shape of fan-like accumulations.

14. THIN SECTION 6KS095

Rock Name: Aplite

Texture: Aplitic, in some places pegmatitic

Composition: Quartz 35%, common potash feldspar 30%, plagioclase 30%, muscovite 5%.

Quartz is observed as grains of irregular shape measuring 0.2-0.3mm in diameter. Sometimes it forms simultaneously decadent intergrowths of irregular shape in common potash feldspars.

Common potash feldspar - microcline is non-lattice-like, pelitizated. Some grains of lattice-like microcline are observed without a touch of secondary alteration.

Plagioclase is the most idiomorphic. It is observed as short prismatic grains of up to 3mm in length. Its composition is referred to albite-oligoclase. Some separate grains are gently sericitizated.

Isolated scales of muscovite are observed of up to 0.5-0.6mm in length.

15. THIN SECTION 6KS110

Rock Name: Greisen

Texture: Granolepidoblastic

Composition: Quartz 55%, colorless micas 40%, beryl 2%, barite, calcite, fluorite, sphene, cassiterite, ore mineral, hydrous ferric oxides 3%.

Quartz is observed as grains of irregular shape, sometimes with dented boundaries, measuring from 0.2 to 0.5mm. The remnants of grains of feldspars, remained after their replacement by quartz and lithia mica, are of irregular whimsical shape.

Colorless micas are represented by muscovite and lithia mica. Muscovite predominates. Large-scaly muscovite often forms fan-like accumulations, (Ng - Np = 0.045-0.052). Lithia mica is thin-scaly, closely-foliated, colorless, (Ng - Np = 0.028-0.030). It is highly possible that this mica is lepidolite. This mica is characterized by formation of scaly accumulations and is often observed together with muscovite. In these scaly masses muscovite is of pale-green color.

Beryl is observed in the shape of isolated grains among micas. Several grains of cassiterite of articulate shape (0.1-0.005mm) are observed here. It becomes visible only under magnification 20x. It is of pale-green color and of high double-refraction, (Ng - Np = 0.097).

Ore mineral (?) replaced by hydrous ferric oxides is observed. Insignificant quantities of calcite and barite are observed among scaly mica

aggregates. Three grains of fluorite (isotropic) and three grains of sphene are observed. The grains of quartz and mica have dented boundaries.

16. THIN SECTION 6KS126

Rock Name: Greisenizated granite

Texture: Relict, granitic, granolepidoblastic.

Composition: Quartz 25%, feldspar 31%, colorless mica 35%, ore minerals, hydrous ferric oxides 5-7%, carbonate 1%, beryl 1%, rutile, apatite, fluorite - isolated grains.

As relict minerals of primary rock are quartz and feldspar. They granulate large grains (0.8-2.5mm) of anhedral shape. Muscovite forms tabular individuals at the length up to 1mm.

Besides, mica accumulates fine, serrate scales which often monomineral and glomeroblastic are formed. These aggregates either entirely replace grains of feldspar of primary rock or selectively, forming net texture of feldspar. The larger scales belong to muscovite (Ng - Np = 0.054), fine scales belong to siderite and lepidolite ? (Ng - Np = 0.029).

Beryl is observed a few fine grains in mass of mica. There are numerous quantity of grains of ore minerals in micaceous aggregate, which are almost fully limonitizated. They associate with ferric carbonates.

17. THIN SECTION 6KS132

Rock name: Beresitizated granite

Texture: Coarse-grained granitic, partly - granolepidoblastic

Composition: Quartz 25%; feldspar, colorless mica 25%; calcite 5%, ore minerals, hydrous ferric oxides 2%, rutile, apatite - isolated grains.

Microcline is light-green. Feldspar and quartz form coarse (1-3mm) grains with rectilinear and weakly curly boundaries. Muscovite form large scales, up to 2mm. Sometimes, muscovite is accumulated in the form of fan.

In a process of hydrothermal alteration, fine sericite is appeared which forms both monomineral accumulations and fine-grained quartz and chlorite. Simultaneously with sericitization, pyrite was formed, and other sulfides were separated through thin hair-like fractures. Thin scaly sericite is developed on contacts of grains of salic minerals and partly replaces feldspar.

Calcite is a xenogenetic mineral which was formed after beresitization.

18. THIN SECTION 6KS156

Rock Name: Beresitizated granite

Texture: Granitic, coarse-grained, lepidoblastic

Composition: Quartz 25%, feldspar 60%, colorless mica 15%, accessory minerals - apatite, ore mineral, zircon.

Quartz and feldspar are of equal degree of idiomorphic. They form grains of anhedral form 1.5-3mm in size. Feldspar is weakly colored light-green. Feldspar includes primary mica as muscovite in the coarse-scaly separations.

Thin-scaly muscovite is developed on thin joints and accumulates fine-grains, being often monomineral. These aggregates content micro-grained quartz and thin impregnation of limonitizated pyrite on some parts. Micaceous aggregates partially replace grains of feldspar in marginal parts.

Zircon and apatite are included as isolated grains in feldspar.

19. THIN SECTION 6 KS138

Rock Name: Beresitizated granite

Texture: Relict, lepidoblastic and granolepidoblastic

Composition: Quartz 30%, feldspar 38%, light mica 25%, calcite 5%, ore minerals, hydrous ferric oxides 1%, epidote, clinozoisite 1%, fluorite - unit separations, apatite - unit grains, leucoxene (sphene), actinolite, rutile - isolated grains.

Rock is intensively beresitizated. Relict grains of quartz and feldspar form large (0.7-2mm) separations of anhedral form. Feldspar is jointly on some parts. Thin-grained quartz and sericite material is separated on some fractures.

Muscovite is coarse-grained and scaly. Muscovite contents poikilitic inclusions of apatite, calcite and thin-grained ore mineral on fractures. Basic mass of feldspar is replaced by thin-scaly sericite. Thin-scaly sericite accumulates fan-like concentrations, and aggregate masses.

Calcite is a xenogenetic mineral. Together with quartz, it composes a veinlet. Calcite is represented in sericite mass where associated with separations of ore minerals.

Ore minerals are limonitizated and partially replaced by leucoxene. Around grains of ore minerals, margin consisting of epidote and clinozoisite

(Ng - Np = 0.015) is developed.

Fluorite is observed in the form of spotted separations in replaced by sericitizated feldspar. Rutile and actinolite in disorder are found in a mass of replaced feldspar. Mass of limonitizated ore mineral is separated through thin branching joints.

20. THIN SECTION 6KS153

Rock Name: Beresitizated granite

Texture: Granitic, lepidoblastic

Composition: Quartz 30%, feldspar 45-50%, colorless mica 20-25%, ore mineral 1%, leucoxene.

Feldspar is a predominant mineral. Feldspar forms grains of anhedral form with curly boundaries 0.5-2.5mm in size. Some parts of feldspar grains are replaced by fine-scaly aggregate of sericite with admixture of crypto-grained quartz. The most xenomorphic mineral is quartz.

Thin-scaly sericite replaces grains of plagioclase and muscovite. Sometimes they can be fixed by forms of separations. Sericite is developed on contacts of grains of feldspar and in thin joints. Ore-mineral is entirely limonitizated and leucoxenizated. Its separation is connected with joints. It is associated with sericite.

APPENDIX. 2-3

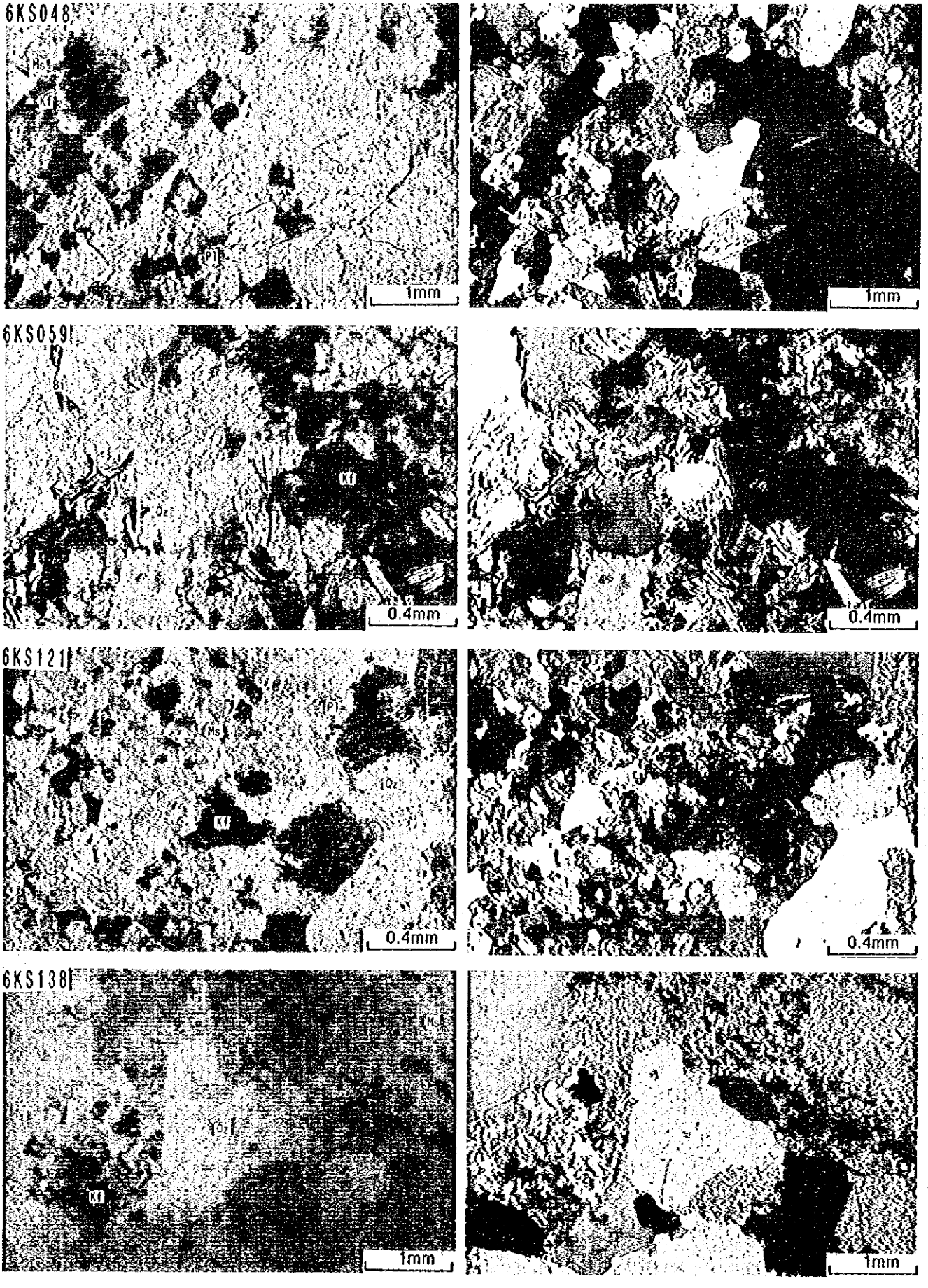
Microscopic Photographs of Thin Section

Abbreviations

Qz : Quartz
Kf : K-feldspar
Pl : Plagioclase
Bi : Biotite
Ms : Muscovite

Plain polarized light

Crossed polarized light



Apx. 2-4 Result of Microscopic Observation of Polished Sections

No.	Sample No.	Drill hole No.	Depth (m)	Ore Minerals / Ore Name	Pyrite	Pyrrhotite	Arsenopyrite	Magnetite	Hematite	Chalcopyrite	Chalcocite	Covellite	Malachite	Bornite		Native gold	Native silver		Pyrolusite	Psilomelane	Goethite	Lepidochrocite
1	6KS010	MJKS-1	62.7	Manganosiderite vein	・					△	・	・							○	○	○	
2	6KS019	MJKS-1	91.0	Manganosiderite vein	・					・	・	・	・			・			○	○	○	○
3	6KS021	MJKS-1	96.3	Manganosiderite vein	・					・									○	○	○	
4	6KS067	MJKS-2	66.3	Manganosiderite vein	・					△	・		・			・			○	○	○	
5	6KS069	MJKS-2	67.9	Manganosiderite vein	・			・		△	・	・	・						△	△	○	○
6	6KS072	MJKS-2	70.9	Quartz Manganosiderite vein	・					・	・					・				・	・	・
7	6KS076a	MJKS-2	74.9	Quartz Manganosiderite vein	・					△	・	・	△	・		・					・	・
8	6KS076b	MJKS-2	74.3	Manganosiderite vein	・														○	○	○	○
9	6KS036	MJKS-3	71.8	Manganosiderite vein	・					・	・	・	・			・			△		△	
10	6KS051	MJKS-3	242.5	Pyrite, chlorite concentrated ore	△					・	・										△	△
11	6KS081	MJKS-4	31.14	Quartz Manganosiderite vein	・					・									△	△	△	△
12	6KS106	MJKS-4	106.2	Quartz Manganosiderite vein	・					・	・	・							△	△	△	
13	6KS113	MJKS-4	111.7	Manganosiderite vein	・		・	・		・							・				・	
14	6KS130	MJKS-5	122.95	Quartz Manganosiderite vein	・					△	・	・	・			・			○	○	○	○
15	6KS133	MJKS-5	142.8	Manganosiderite vein	・					・	・		・			・			・	・	△	△
16	6KS134	MJKS-5	144.3	Manganosiderite vein	・					△			・						△		○	
17	6KS140	MJKS-6	134.7	Quartz Manganosiderite vein	・					・			△			・				△	○	△
18	6KS141	MJKS-6	135.6	Quartz Manganosiderite vein	・					・						・			△	△	△	
19	6KS144	MJKS-6	138.4	Quartz Manganosiderite vein						・						・			△	△	△	
20	6KS145	MJKS-6	139.2	Quartz Manganosiderite vein	・					△	・	・	△								△	
21	6KS148	MJKS-6	142.1	Manganosiderite vein	・					・	・								○	○	○	○
22	6KS172	MJKS-7	118.85	Manganosiderite vein	・				・	△	・		△							△	○	
23	6KS195	MJKS-9	107.5	Manganosiderite vein	・	・		・	・	・			△			・				△	○	○
24	6KS251	MJKS-11	210.4	Manganosiderite vein	・					・							・		△	○	○	△
25	6KS271	MJKS-11	229.8	Manganosiderite vein	・					・		・				・	・		△	○	○	
26	6KS227	MJKS-12	180.1	Manganosiderite vein	・					・						・	・		○	△	○	

◎ : Abundant (>50%) ○ : Common (50–20%) △ : Poor (20–5%) ・ : Rare (<5%)

Description of Microscopic Observation of Polished Section

1. POLISHED SECTION 6KS010

Texture: U-shaped, carcass on siderite, socket-impregnated.

Composition: Hydrous manganic oxides and hydrous ferric oxides 50%, chalcopyrite 5-7%, chalcocite, covellite, pyrite.

Ore mineralization is mainly represented by hydrous manganic oxides, hydrous ferric oxides, chalcopyrite and smaller quantities of chalcocite, pyrite.

Hydrous ferric oxides are represented by goethite and form compact masses of dark-brown and brown color, which is a result of oxidation of siderite and chalcopyrite.

Microstructure: Colloform, convergence-zonal, structure of frost patterns.

Hydrous manganic oxides are represented by pyrolusite and psilomelane. They are a part of compact limonite masses and form thin intergrowths with them. Hydrous manganic oxides are also observed in the form of thin branched filled fissures going through the rock. The width of the fissures varies within the limits of 0.01-0.3mm.

Microstructure: Convergence-zonal, network.

Chalcopyrite is observed in the form of isolated grains and also forms sockets measuring 0.5-1.0cm. Chalcopyrite (from thin rims to complete pseudomorphs) is replaced by hydrous manganic oxides. With this, a thin rim (0.005-0.01mm) of tabular chalcocite and covellite is observed on the boundaries of the grains of chalcopyrite and hydrous ferric oxides.

Microstructure: Allotriomorphic-granular, interstitial, relict.

Pyrite is observed in limonite mass in the form of small grains (0.005-0.01mm) of cubic irregular shape.

Microstructure: Relict, idioblastic.

2. POLISHED SECTION 6KS019

Texture: U-shaped, carcass on siderite, spotted.

Composition: Hydrous manganic oxides and hydrous ferric oxides 60-65%, malachite 0.5%, chalcopyrite, chalcocite, covellite, pyrite.

Ore mineralization is widely spread and is represented by hydrous manganic and ferrous oxides. Gold, pyrite, chalcopyrite, covellite, malachite

and hematite are observed in smaller quantities.

Hydrous manganic oxides were formed as a result of oxidation of manganosiderite and are represented by psilomelane, pyrolusite, and polianite (a thin-crystalline variety of pyrolusite). They are observed both in the form of compact thin-grained mass of convergence-zonal composition and in the form of sooty masses which are components of framework walls.

Microstructure: Colloform, convergence-zonal, fine-grained, sooty.

Hydrous ferric oxides are represented by goethite and lepidochrocite and are observed:

1. together with hydrous manganic oxides in the form of fine-grained, cryptocrystalline aggregates on manganosiderite;
2. in the form of compact collomorphic aggregates on chalcopyrite;
3. pseudomorphs of goethite and lepidochrocite on pyrite.

Microstructure: Collomorphic convergence-zonal, pseudomorphs on pyrite.

Gold is observed in the amount of 5 signs. According to classification after N. V. Petrovskaya, the particles of gold are visible, very small and small, measuring from 0.01 x 0.01mm to 0.024 x 0.025mm. The shape of the particles is equidimensional, elongated, with equal boundaries. Color is bright aureate-yellow. The particles are observed with hydrous ferric oxides formed on chalcopyrite, and are confined to the fractures in quartz.

Copper mineralization (less than 1%) is represented by chalcopyrite, chalcocite, covellite, malachite.

Chalcopyrite, earlier represented by isolated grains and allotriamorphic-granular aggregates, . is almost entirely rhythmically replaced by compact dark-brown, red-brown masses of hydrous ferric oxides (mainly by goethite) as a result of oxidation. As a rule, oxidation begins from formation of a very thin (0.01 - 0.02mm) zone of enrichment from chalcocite and sometimes from chalcocite and covellite.

Malachite is crystalline and fills the gaps and fractures in the rock.

Microstructure: Relict (chalcopyrite), structure of boundary rims (chalcocite, covellite), allotriomorphic-granular (malachite).

Pyrite is observed in the form of small grains (0.01 - 0.05mm) with irregular sinuous boundaries, which group into chains and are confined to pseudomorphs of limonite on pyrite.

Microstructure: Relict.

3. POLISHED SECTION 6KS021

Texture: Brecciated

Composition: Hydrous manganic oxides and hydrous ferric oxides 60-65%, chalcopyrite, pyrite.

Fragments of oxidized manganosiderites are cemented by calcite and quartz. Under oxidation manganosiderite is being replaced by hydrous manganic and ferric oxides. The degree of replacement varies from the initial stages with formation of subgraphic structures of replacement to formation of complete pseudomorphs. The central parts of pseudomorphs are composed of psilomelane, the outer zones of pseudomorphs are composed of compact convergence-zonal aggregates of hydrous ferric oxides and pyrolusite.

Microstructure: Convergence-zonal, subgraphic of replacement to complete pseudomorphs.

Chalcopyrite is observed in the form of small isolated grains measuring 0.01 - 0.02mm, the shape of the grains is irregular with sinusous boundaries between limonite masses.

Microstructure: Relict

Pyrite is observed in the form of small isolated grains (0.005 - 0.01mm) both in the fragmental part of the rock (compact limonite masses) and in the cement (quartz, calcite).

Microstructure: Relict, idioblastic.

4. POLISHED SECTION 6KS067

Texture: Socket-impregnated, U-shaped, carcass.

Composition: Chalcopyrite 10 %, chalcocite isolated grains, gold 4 signs, malachite 1-2%, pyrite less than 1%, hydrous manganic oxides 18-20%, hydrous ferric oxides 50%.

Ore mineralization is widely represented by hydrous ferric and manganic oxides, which are observed in the shape of compact cryptocrystalline mass of concentric-zonal structure in the conditions of oxidation of manganosiderite. Also, hydrous ferric oxides are formed with an oxidation of chalcopyrite and pyrite.

Chalcopyrite forms separations of irregular shape measuring from fractions of 1mm to 0.6mm. Thin rim of chalcocite is often observed around the grains of chalcopyrite.

Malachite is observed in the shape of columnar aggregates filling fractures and cavities in the rock.

Gold - 4 signs. It forms intergrowths with chalcopyrite and is also observed among limonite masses which are formed on chalcopyrite. The dimensions of gold particles are:

0.018 x 0.02 mm - 3 signs

0.007 x 0.006 mm - 1 sign.

Color: bright yellow.

Pyrite is observed in quartz in the shape of small grains measuring from 0.005 to 0.01mm and also in the shape of relics (0.003 - 0.1 mm) in limonite masses.

5. POLISHED SECTION 6KS069

Texture: Socket-impregnated, U-shaped, carcass.

Composition: Chalcopyrite 10-15%, pyrite 1%, magnetite - isolated grains, hydrous manganic oxides 10-15%, hydrous ferric oxides 30%, chalcocite - isolated grains, covellite - isolated grains, malachite - less than 1%.

Large quantities of hydrous ferric oxides, hydrous manganic oxides and chalcopyrite are observed. Other minerals are represented in smaller quantities.

Hydrous manganic oxides are represented by psilomelane, and pyrolusite and form tight intergrowths with hydrous ferric oxides in the shape of concentric-zonal aggregates, which have been developed as a result of oxidation of manganosiderites. With this, some areas of manganosiderites are completely replaced and some areas are replaced on the surfaces of cleavage only with the formation of lattice-like structures.

Hydrous ferric oxides are represented by hematite, lepidochrocite and are developed on manganosiderites, sulfides (pyrite, chalcopyrite) from insignificant replacements to formation of complete pseudomorphs and also replace gangue minerals on the surfaces of cleavage and in intergranular seams with the formation of lattice-like microstructures.

Copper mineralization is mainly represented by chalcopyrite and to some extent - by malachite, isolated grains of chalcocite and covellite.

Chalcopyrite is observed in quartz in the shape of isolated small grains (0.02-0.03mm) and also in the shape of accumulations of grains rhythmically

replaced by compact reddish-brown and yellow-brown masses of goethite. Thin rim of chalcocite and covellite is developed around the grains of chalcopyrite. Malachite in the shape of columnar aggregates fills cavities in the rock.

Pyrite is observed in quartz and carbonate as small idiomorphic grains of cubic shape (0.005-0.02mm). Relict pyrite is represented by grains of irregular shape among hydrous ferric oxides.

Magnetite is observed among grains of quartz in the form of isolated small grains of octahedral shape measuring 0.05 mm.

6. POLISHED SECTION 6KS072

Texture: Thin-impregnated, U-shaped, carcass.

Composition: Hydrous ferric oxides 3-4%, Hydrous manganic oxides 1-2%, gold - 4 signs, pyrite less than 1%, chalcopyrite, chalcocite - isolated grains.

Ore mineralization is represented by gold, pyrite, chalcopyrite, chalcocite, hydrous ferric and manganic oxides.

Gold - 4 signs. The dimensions of the particles (mm):

0.024 x 0.006

0.005 x 0.007

0.01 x 0.006

0.003 x 0.002

Color: Bright yellow. Gold is visible, dust-like, very small. The shape of gold particles is dumb-bells-like, hooked. All the gold particles are observed in association with hydrous ferric oxides which, in their turn, are pseudomorphs on pyrite.

Pyrite is observed as small (0.005-0.01mm) impregnation in quartz. It is of cubic and pentagonal dodecahedral shape. It also composes small (1-2mm) nests in the rock. Pyrite is significantly replaced by hydrous ferric oxides (from border rims to formation of complete pseudomorphs).

Microstructure: Relic, crumbled, idiomorphic.

Chalcopyrite is observed in the shape of isolated grains in quartz and carbonate, dimensions of separations - 0.003-0.2mm, the shape of separations is irregular. Chalcopyrite is to various extent (up to formation of complete pseudomorphs) is replaced by hydrous ferric oxides (goethite). As a rule, the process of oxidation goes on from formation of thin (0.005mm)

margin of chalcocite.

Microstructure: Interstitial, relic.

Hydrous manganic oxides are represented by psilomelane (develops as a result of oxidation of manganosiderite ?) and together with hydrous ferric oxides with which they are in tight intergrowths, form compact cryptocrystalline rhythmical-zonal aggregates of dark brown color.

Microstructure: Concentric-zonal, cryptocrystalline.

Hydrous ferric oxides are represented by lepidochrocite and goethite, and are developed:

1) on pyrite (goethite, lepidochrocite);

2) on chalcopyrite (goethite);

3) on manganosiderite (lepidochrocite, goethite);

4) fill fractures and intergranular space in the rock.

Microstructure: Rhythmical-zonal, lattice-like, structures of border rims up to complete pseudomorphs.

7. POLISHED SECTION 6KS076a

Texture: Impregnated

Composition: Chalcopyrite, chalcocite, covellite, malachite, bornite, pyrite, hydrous ferric oxides, free gold.

Copper mineralization (5-10%) is mainly represented by chalcopyrite and malachite. Chalcocite, covellite, bornite are observed in smaller quantities (isolated grains).

Chalcopyrite in the shape of small grains (0.01-0.02mm) is observed in quartz and is also observed as separations of irregular shape measuring up to 1.0mm. The latter are significantly replaced by hydrous ferric oxides (goethite) in the shape of compact red and brown masses. The borders between chalcopyrite and hydrous ferric oxides are step-like, sinuous. Some grains of chalcopyrite are rimmed by thin margins of covellite and chalcocite.

Bornite - one grain of an oval shape, measuring 0.01mm, is observed in quartz.

Gold - 2 signs. Color: bright yellow, dimensions - 0.03 x 0.028mm, of octahedral shape, confined to fractures in quartz.

Pyrite is observed in quartz as small idiomorphic grains of cubic and octahedral shape, measuring 0.003-0.07mm. Some grains of pyrite are replaced by hydrous ferric oxides (goethite, lepidochrocite) with the

formation of crumbed structure.

8. POLISHED SECTION 6KS076b

Texture: Impregnated, U-shaped, carcass on carbonate.

Composition: Hydrous manganic oxides and hydrous ferric oxides 60-70%, pyrite - isolated grains.

Multiple veinlets of quartz composition (thickness from fractions of a mm to 1-2mm) run through vein quartz-carbonate rock. As a result of oxidation, carbonate (manganosiderite) is completely replaced by compact masses of hydrous ferric oxides and hydrous manganic oxides of dark brown color, which are in tight intergrowths with each other and are of concentric-zonal composition.

Hydrous ferric oxides are also developed on pyrite and are represented by lepidochrocite and goethite. Oxidation often goes on up to formation of complete pseudomorphs.

Sometimes pyrite relics of irregular shape are observed, dimensions from 0.005 to 0.02mm. Structure for pyrite is relic and that for hydrous manganic oxides - concentric-zonal, cryptocrystalline, formation of pseudomorphs is observed.

9. POLISHED SECTION 6KS036

Texture: U-shaped, carcass on siderite, spotted.

Composition: Hydrous manganic oxides and hydrous ferric oxides 10-15%, pyrite, covellite, chalcocite, chalcopyrite, gold, malachite.

Ore mineralization (10 - 15%) is represented by hydrous ferric and manganic oxides with lower quantities of gold, pyrite, chalcopyrite, chalcocite, covellite, malachite.

Hydrous manganic oxides (mainly represented by pyrolusite) together with hydrous ferric oxides (mainly goethite) form compact collomorphic separations of black, dark-brown and brown color. The distribution of hydrous ferric oxides and hydrous manganic oxides within the limits of the thin section is uneven and is mainly confined to manganosiderite on which they are formed in the process of oxidation.

Microstructure: Collomorphic, convergence-zonal, structure of frost patterns.

Gold is observed in the amount of ten signs. Gold particles are visible,

small and very small. The particles are of the following dimensions:

0.006mm x 0.008mm - 2 signs;

0.005mm x 0.01mm - 2 signs;

0.01mm x 0.01mm - 4 signs;

0.03mm x 0.028mm - 1 sign;

0.042mm x 0.018mm - 1 sign.

The shape of the particles is equidimensional, elongated, with even boundaries. The color is bright, aureate-yellow. The major part of the gold particles is connected with limonite, some of the signs are confined to micro-fractures in quartz.

Microstructure: Allotriomorphic-granular.

Chalcopyrite is observed in the form of isolated small grains (0.01 - 0.05mm) of equidimensional shape with smoothed edges in quartz and also in the form of relics in limonite mass.

Structure: Relict, xenoblastic.

Chaclocite and covellite are observed in the form of thin rims around chalcopyrite.

Microstructure: Limbate

Malachite is crystalline and fills up gaps and fractures in the rock.

Microstructure: Radiated, allotriomorphic-granular.

Pyrite is observed in quartz in the form of small (0.001 - 0.05mm) grains of cubic shape.

Microstructure: Idioblastic.

10. POLISHED SECTION 6KS051

Texture: Socket-impregnated.

Composition: Pyrite 15-20%, chalcopyrite 1%, limonite 5-10%, chalcocite.

Ore mineralization is represented by pyrite, limonite, chalcopyrite, chalcocite.

Pyrite is observed in the form of isolated grains and also forms accumulations. The shape of grains is equidimensional, mainly cubic, pentagonal and dodecahedral. Dimensions of the grains vary from 0.005 to 1.0mm, boundaries of the grains are even, straight. Some part of pyrite grains contain inclusions of chalcopyrite, and to various exent is replaced by chalcopyrite and limonite.

Microstructure: Idiomorphic, relict.

Chalcopyrite is observed in the form of isolated grains and fills intergranular gaps in non-metallic minerals and is also observed in the form of small inclusions in pyrite and replaces pyrite in multiple fractures. In its turn, chalcopyrite contains inclusions of pyrite of idiomorphic form. There are insignificant replacements of chalcopyrite by chalcocite and limonite.

Microstructure: Interstitial, thread-like structures of replacement.

Limonite is represented by fine-grained aggregate of goethite and lepidochrocite, which is formed in the process of oxidation of pyrite, chalcopyrite. The degree of replacement varies, up to formation of complete pseudomorphs.

Microstructure: Structures of replacement from rims and subgraphic replacement up to complete pseudomorphs.

11. POLISHED SECTION 6KS081

Texture: Socket-impregnated, U-shaped, carcass.

Composition: Hydrous manganic oxides and hydrous ferric oxides 10%, pyrite - isolated grains, chalcopyrite - isolated grains.

As a result of oxidation, vein carbonate-quartz rock is significantly replaced by hydrous ferric oxides and hydrous manganic oxides. Hydrous manganic oxides (psilomelane, pyrolusite) together with hydrous ferric oxides (goethite, lepidochrocite) compose compact concentric-zonal aggregates of dark brown in color.

Besides, thin rims of hydrous ferric oxides fill intergranular space and are also developed on sulfides. Small grains (0.005mm) of pyrite are observed among grains of quartz. Chalcopyrite is also observed among quartz grains in the shape of small grains (0.01-0.04 mm).

12. POLISHED SECTION 6KS106

Texture: Socket-impregnated, U-shaped, carcass

Composition: Chalcopyrite 1-2%, covellite - isolated grains, chalcocite - isolated grains, pyrite - isolated grains, hydrous ferric oxides and hydrous manganic oxides 5%.

Chalcopyrite is observed as separations of irregular shape measuring from fractions of a mm to 3.0mm. Chalcopyrite is to various extent replaced by hydrous ferric oxides (goethite). The degree of replacement is from insignificant to formation of complete pseudomorphs.

Chalcocite and covellite are developed around the grains of chalcopyrite in the shape of a thin margin (0.005-0.01mm). Pyrite is observed in quartz as small isolated grains of cubic shape (0.01mm).

As a result of oxidation, areas composed of manganosiderite are replaced by compact zonal concentric aggregates composed of hydrous ferric oxides and manganic ferric oxides, which are in tight intergrowths with each other. The color of these aggregates is dark brown. The degree of replacement is various - from initial stages with the formation of subgraphic, lattice-like structures to formation of complete pseudomorphs.

13. POLISHED SECTION 6KS113

Texture: Thin-impregnated

Composition: Arsenopyrite - isolated grains, pyrite - isolated grains, chalcopyrite - isolated grains, magnetite - isolated grains, free silver(?) - 2 signs, rutile - less than 1%, hydrous ferric oxides - 1-2%.

The ore mineralization is rather scant and is represented by hydrous ferric oxides, rutile and isolated grains of pyrite, chalcopyrite, arsenopyrite, magnetite, free silver(?).

Pyrite is observed in quartz and in mica aggregates as small grains (0.01-0.05mm) of cubic and irregular shape. It is often confined to the fractures in gangue minerals.

Arsenopyrite (1 grain, measuring 0.04 x 0.01mm) is observed in a fracture in quartz.

Chalcopyrite (grains of irregular shape, measuring 0.01mm) fills interstitial between gangue minerals.

Magnetite is observed among quartz grains in the form of small separations of octahedral shape measuring 0.01-0.02mm. It is also observed in mica aggregate.

Free silver(?) - two dotted separations measuring 0.001-0.002mm are confined to fractions in quartz.

Rutile is observed as small grains of prismatic shape measuring 0.005 x 0.02mm, 0.005 x 0.05mm, 0.005 x 0.1mm. As a rule, it is confined to mica aggregates and sometimes confined to other gangue minerals.

Hydrous ferric oxides are represented by goethite. They form subgraphic intergrowths with gangue minerals.

14. POLISHED SECTION 6KS130

Texture: Framework, impregnated

Composition: Hydrous ferric and manganic oxide 50%, chalcopyrite 5-6%, malachite 1-2%, gold - 3 signs, pyrite - traces.

In all three cases, gold is confined to a contact of carbonate (manganosiderite with host rock).

Gold 2 signs - 0.036 x 0.03mm in size, occurs among hydrous ferric and manganic oxides formed on manganese-siderite in contact with quartz.

Gold 1 sign - 0.042 x 0.015mm in size. The form is anhedral with curly boundaries.

Microstructure: Interstitial.

Basic copper minerals are chalcopyrite and malachite.

Chalcopyrite occurs as separated grains and aggregates of grains 1-6mm in size. Chalcopyrite is replaced by hydrous ferric oxide in varying degrees along grain boundaries and numerous joints, up to formation of full pseudomorphs. Oxidation of chalcopyrite is often accompanied with formation of limonite masses, rarely zone of concentration of platy chalcocite and covellite is appeared around chalcopyrite.

Microstructure: Interstitial, relict.

Pyrite is represented by fine grains of isometric form from 0.005 to 0.01mm in size in gangue minerals. Besides, fine relics among limonite mass are found.

Microstructure: Poikilitic, relict.

Hydrous ferric oxides are represented by goethite and lepidochrocite, and are formed as a results of oxidation of pyrite, chalcopyrite and manganosiderite.

Manganese-siderite is entirely replaced by cryptocrystalline aggregates of hydrous ferric and manganic oxides. Hydrous manganic oxides are represented by pyrolusite and psilomelane.

Microstructure: Colloform, concentric-zonal.

15. POLISHED SECTION 6KS133

Texture: Impregnated.

Composition: Hydrous ferric oxide 5%, hydrous manganic oxide 1-2%, malachite 1%, chalcopyrite - traces, pyrite - traces, chalcocite -

traces, gold -1 sign.

Gold - 1sign, dimensions - 0.012-0.009mm, color - bright-yellow.

Gold is found among limonite masses formed as a result of oxidation of manganosiderite. The form is isometric, cubic-shaped.

Chalcopyrite is found in the form of fine punctuate separations of isometric form in gangue minerals. Size of separation is from 0.005 to 0.05mm.

Microstructure: Poikilitic.

Pyrite occurs as fine grains of anhedral form ranging from 0.005 to 0.05 in size among limonite masses.

Microstructure: Relict.

Malachite is presented in the form of small nests and weak, short veinlet.

Microstructure: Columnar, allotriomorphic-granular.

Some parts of with framework texture composed by dense cryptocrystalline masses consisting of mixture of hydrous ferric and manganic oxides (these are pseudomorphs along manganosiderite) are found in the samples.

Microstructure: Rhythmic, zonal concentric.

16. POLISHED SECTION 6KS134

Texture: Framework, impregnated.

Composition: Hydrous ferric oxides 60%, hydrous manganic oxides 5-8%, chalcopyrite 5%, malachite 1%.

Primary rock is siderite-like carbonate. As a result of oxidation, primary rock is entirely replaced by hydrous ferric oxides (goethite) and some amount of hydrous manganic oxides (pyrolusite).

Hydrous ferric oxides compose walls and crosspieces of frameworks. Surface of cavities is covered by earthy ocher of hydrous ferric oxides. Walls and crosspieces are composed by dense cryptocrystalline masses.

Besides, hydrous ferric oxides are formed along chalcopyrite and pyrite in the form of cryptocrystalline aggregates and are characterized by rhythmic zonal-festoony structure and in the form of thin intergranular skin among gangue minerals.

Microstructures: Frontal rim; lattice - like, full pseudomorphs, cryptocrystalline, earthy zonal-festoony.

Hydrous manganic oxides are represented by pyrolusite in the form of dense cryptocrystalline aggregates which are located in the form of separated interlayers among limonite masses.

Chalcopyrite is represented in the form of the fine granulars, which nests are cut by numerous joints filled with hydrous ferric oxides (goethite) .

Microstructure: Allotriomorphic-granular, interstitial.

Malachite is represented in the form of columnar, fine-grained aggregates. Malachite composes nests and veins in the rock.

17. POLISHED SECTION 6KS140

Texture: Streaky - impregnated, framework.

Composition: Hydrous ferric oxide 25-30 %, hydrous manganic oxide 5%, malachite 5-8%, gold - 2 tens of sings, pyrite - traces, chalcopyrite - traces.

Ore mineralization is widely represented by hydrous ferric oxides formed as a result of oxidation of chalcopyrite, manganosiderite which formation of fine pseudomorphs.

Hydrous ferric oxides are represented by goethite, to a lesser degree by lepidochrocite and they are observed in the form of red, dark-brown cryptocrystalline masses with concentric zonal structure.

Hydrous manganic oxides are represented by psilomelane which forms together with hydrous ferric oxides (goethite) pseudomorphs on manganosiderite. They are characterized by cryptocrystalline aggregates of concentric zonal structure.

Gold (two tens of signs)

Size of gold is variable as follows: from 0.001 x 0.002mm to 0.04 x 0.08mm. The prevailing sizes are 0.03 x 0.02mm.

According to classification of N. V. Petrovskaya, gold is visible; rarely dust-like, basically fine.

Color: Bright yellow. Form: Isometric, oval, anhedral.

Gold occurs:

- in joints, in intergranular area among grains of quartz, feldspar; as a rule it is associated with limonite.

- among limonite masses formed on chalcopyrite.

Microstructure: Interstitial.

Copper minerals are represented by chalcopyrite in the form of the fine,

punctate grains of oval shape from 0.005 to 0.01mm in size and confined to gangue minerals (quartz and feldspar).

Malachite filling joints in a rock in the form of columnar, fine-grained aggregates is the most widely spread.

Microstructure: Columnar, allotriomorphic-grained.

Pyrite - fine idiomorphic grains, 0.005-0.02mm in size are confined to gangue minerals.

Microstructure: Idiomorphic.

18. POLISHED SECTION 6KS141

Texture: Brecciated, spotted, framework.

Composition: Hydrous ferric oxides 15-20%, hydrous manganic oxides 10%, pyrite - traces, chalcopyrite - traces, gold - 2 signs.

Primary manganosiderite rock is broken down and cemented by calcite of rusty brown color. Retained parts of manganosiderite as a result of oxidation are replaced by cryptocrystalline masses which are composed by mixture of hydrous ferric and manganic oxides.

Microstructure: Cryptocrystalline, concentric zonal.

Hydrous ferric oxides (goethite) are widely developed on calcite and confined to planes of cleavage, joints and intergranular sutures with formation of latticed microstructure resulting rusty brown color of the rock.

Gold - two sings, sizes - 0.005 x 0.006mm.

Color is bright yellow. Gold is confined to interstitial in gangue minerals.

Microstructure: Interstitial.

Chalcopyrite is represented by fine grains of oval, anhedral form with margin of limonite composition.

Microstructure: Interstitial, relict.

Pyrite - grains of cubic form, 0.005-0.01mm in size in gangue minerals.

Microstructure: Idiomorphic.

19. POLISHED SECTION 6KS144

Texture: Brecciated, framework.

Composition: Hydrous ferric oxides and hydrous manganic oxides 60%, gold - 1 sign, chalcopyrite - traces.

Broken parts of manganosiderites are cemented by calcite material. Ore

mineralization is basically represented by hydrous ferric oxides and hydrous manganic oxides in the form of cryptocrystalline masses of dark brown color with concentric zonal structure.

Gold - one sign, 0.012 x 0.015mm in size, of isometric form. Gold is found among limonite masses.

Microstructure: Interstitial.

Chalcopyrite - punctate separations (0.005-0.01mm in size) are found in calcite.

Microstructure: Poikilitic.

20. POLISHED SECTION 6KS145

Texture: Pocket-impregnated

Composition: Chalcopyrite 10%, malachite 10%, covellite - traces, chalcocite - traces, hydrous ferric oxides 30%, pyrite < 0.1%.

Copper mineralization is represented by chalcopyrite, malachite, small amount of chalcocite and covellite.

Chalcopyrite forms nests from fractions of mm to tens of mm in size. As a result of oxidation, chalcopyrite is widely replaced by hydrous ferric oxides (goethite). Some grains of chalcopyrite have a margin of low grade replacement, composed of chalcocite and covellite.

Microstructure: Interstitial, allotriomorphic-grained.

Malachite forms veins and nests in a rock. Malachite occurs in the form of columnar and fine-grained aggregates.

Microstructure: Columnar, allotriomorphic-grained.

Hydrous ferric oxides are represented by goethite, its basic mass is formed as a result of oxidation of chalcopyrite in the form of colloform zonal concentric masses of reddish brown color. In subordinate quantity they are formed on pyrite. Degree of replacement is different: from frontal rims to full pseudomorphs.

Microstructure: Frontal rims, latticed, up to full pseudomorphs.

Pyrite - fine grains 0.01-0.02mm in size in gangue mineral, partly replace by hydrous ferric oxides (goethite, lepidochrocite).

Microstructures: Crumbled, relict, idiomorphic.

21. POLISHED SECTION 6KS148

Texture: Framework, impregnated.

Composition: Hydrous ferric oxides and hydrous manganic oxides 50%, chalcopyrite - traces, chalcocite - traces, pyrite - traces.

Basic ore minerals (hydrous ferric oxides and hydrous manganic oxides) are developed on manganese-siderite forming pseudomorphs there. These parts have framework texture. Cavities are right-angled 0.5-1.0mm in size. Surface of cavities is covered with earthy ochre of rusty brown color. Walls and crosspieces are composed by dense cryptocrystalline aggregates of black, dark brown color being a mixture of hydrous ferric oxides manganic oxides.

Minor part of hydrous ferric oxides (lepidochrocite, goethite) is formed as a result of oxidation of pyrite, chalcopyrite, creating colloform concentric zonal aggregates.

Microstructures: Earthy, cryptocrystalline, concentric zonal structures of frontal rim up to full pseudomorphs.

Chalcopyrite forms separated grains of oval and anhedral form, 0.5-1.0mm in size, relics of grains.

Some grains of chalcopyrite have a margin of low grade (0.01mm) which consists of chalcocite and limonite.

Microstructure: Poikilitic, relict.

Pyrite forms grains of isometric from among gangue minerals and limonite masses.

Size of grains is around 0.005-0.01mm.

Microstructures: Idiomorphic, relict.

22. POLISHED SECTION 6KS172

Texture: Spotted, impregnated, U-shaped, carcass.

Composition: Hydrous ferric oxides 60%, hydrous manganic oxides 5%, chalcopyrite 10-12%, malachite 10%, chalcocite - traces, pyrite - traces, hematite 1-2%.

Within the limits of polished section, the area is initially composed of xenomorphic-granular aggregates of chalcopyrite, which, to a considerable extent, is replaced by cryptocrystalline aggregates of hydrous ferric oxides of rusty-brown color with the relics of chalcopyrite (0.01-0.1mm) preserved. The major part of chalcopyrite is replaced by hydrous ferric oxides (goethite). Only some of the grains of chalcopyrite have a thin rim (0.005 mm) composed of tabular chalcocite.

Microstructures: Relict, xenomorphic-granular.

Small areas (10% of the total area of the section) of U-shaped carcass texture are observed in the rock. They were formed as a result of oxidation of manganosiderites and are represented by cryptocrystalline aggregates of dark-brown color composed of a mixture of hydrous ferric and hydrous manganic oxides with the formation of zonal-concentric structures.

Pyrite is observed among gangue minerals in the shape of separate small grains (0.005-0.01mm).

Hematite occurs as a single grain of columnar shape (2.0mm).

Malachite is observed in the shape of columnar and xenomorphic-granular aggregates filling cavities and pockets in the rock.

Microstructures: Columnar, xenomorphic-granular.

23. POLISHED SECTION 6KS195

Texture: Socket-impregnated, U-shaped, carcass.

Composition: Hydrous ferric oxides 45%, hydrous manganic oxides 10%, gold - 10 signs, malachite 15%, hematite 10-15%, magnetite 1-2%, chalcopyrite - traces, pyrite - traces, pyrrhotite - traces.

Ore mineralization is widely represented by hydrous ferric oxides, which are observed on chalcopyrite with the formation of complete pseudomorphs; on pyrite which is almost entirely replaced by cryptocrystalline aggregates of hydrous ferric oxides; on manganosiderite which is replaced to a various extent, from thin red rims and rims across the surface of cleavage up to the formation of complete pseudomorphs.

The composition of hydrous ferric oxides is as follows: goethite and lepidochrocite.

Microstructures: Cryptocrystalline, zonal-concentric, of frost-pattern structure, festoony, net-like, structures of rims up to complete pseudomorphs.

Hydrous manganic oxides are represented by psilomelane. In a mixture with hydrous ferric oxides, it forms cryptocrystalline aggregates of dark-brown, brown and black color and is observed on manganosiderite in the shape of thin rims on the boundaries of grains and across the surfaces of cleavage up to formation of complete pseudomorphs.

Microstructures: Cryptocrystalline, concentric-zonal, net--like, structures of replacement from rims to complete pseudomorphs.

Gold is observed among hydrous ferric oxides and hydrous manganic

oxides masses, and is also observed in quartz:

1 sign - 0.005 x 0.005 mm, 2 signs - 0.012 x 0.012 mm,
1 sign - 0.042 x 0.018 mm, 2 signs - 0.018 x 0.012 mm,
1 sign - 0.03 x 0.03 mm, 5 signs - 0.072 x 0.02 mm,
1 sign - 0.018 x 0.03 mm.

Gold is tabular, lump-shaped, crystalline (octahedral).

Color: Bright-yellow.

Microstructures: Poikilitic, idiomorphic.

Hematite is observed in the shape of columnar aggregates measuring 0.5-1.0mm. Some individuals are to various extent replaced by magnetite along the boundaries of grains and in fractures and are of net-like shape.

Microstructure: Columnar.

Pyrite and pyrrhotite are observed in quartz in the shape of separate small grains of 0.025-0.01 mm.

Pyrite, in the shape of relics, is also observed in pseudomorphs of hydrous ferric oxides on pyrite.

Microstructures: Idiomorphic, relict.

The major mass of chalcopyrite is replaced by hydrous ferric oxides with the formation of complete pseudomorphs. In quartz, separate grains of chalcopyrite are observed in the shape of oval dotted separations (0.03-0.02mm).

Microstructure: Poikilitic.

Malachite is represented by columnar, xenomorphic-granular aggregates filling cavities and veinlets in the rock.

Microstructure: Xenomorphic-granular, columnar.

24. POLISHED SECTION 6KS251

Texture: U-shaped carcass

Composition: Hydrous manganic oxides and hydrous ferric oxides 35 - 40%; pyrite - traces; chalcopyrite - traces, native silver - 3 signs.

Ore mineralization is mainly represented by hydrous ferric and hydrous manganic oxides, which were developed in the process of oxidation on manganosiderite in the shape of cryptocrystalline aggregates of dark-brown and rusty-brown color. With this, U-shaped carcass texture is formed. Cells are mainly of rectangular shape with a diameter of the tenth and the hundredth fractions of a millimeter. The walls of the cells are composed of

dense aggregates of the mixture of hydrous ferric and manganic oxides of dark-brown color. The thickness of the walls is 0.05 - 0.2 mm.

Hydrous manganic oxides are mainly represented by psilomelane and by smaller quantities of pyrolusite. They are composed of dense cryptocrystalline masses and form the walls of the cells.

Microstructure: Cryptocrystalline, concentric-zonal.

Hydrous ferric oxides are represented by goethite and by smaller quantities of lepidochrocite.

1. Their major mass composes the walls of the cells.

2. Insignificant quantities of hydrous ferric oxides are developed on pyrite and also around quartz grains in the shape of films forming loop-like microstructures.

Native silver (2 signs) is observed among limonite masses in the shape of dotted separations, measuring 0.005 - 0.005 mm.

Pyrite is observed as grains of irregular shape measuring 0.01 mm. These are relics of pyrite entirely replaced by goethite and lepidochrocite.

Microstructure: Relict.

Chalcopyrite is observed as separate small grains included in quartz (0.005 - 0.02 mm). The grains are of oval isometric shape.

Microstructure: Poikilitic.

25. POLISHED SECTION 6KS271

Texture: U-shaped, carcass

Composition: Hydrous manganic oxides and hydrous ferric oxides 60%, chalcopyrite 2%, gold 5 signs, native silver 1 sign, pyrite - traces, covellite - traces.

Ore mineralization is widely spread and is mainly represented by cryptocrystalline aggregates of dark-brown, black and rusty-brown color, composed of a mixture of hydrous ferric and manganic oxides, which were formed as a result of oxidation of manganosiderite with the formation of U-shaped, carcass texture. The texture is characterized by the availability of cells of rectangular and triangular shape, having diameter from fractions of a millimeter to whole millimeters. The thickness of walls of the cell makes up 0.1 - 0.2 mm and they are composed of a dense mixture of hydrous ferric and manganic oxides. Some of the cells are empty and some are filled with earthy masses of hydrous ferric and manganic oxides.

Hydrous manganic oxides are mainly represented by psilomelane and to some extent by pyrolusite.

Hydrous ferric oxides are represented by goethite and in their major mass are formed on manganosiderite.

Insignificant quantities of hydrous ferric oxides are observed on pyrite, chalcopyrite and also fill intergranular space between gangue minerals.

Microstructures: Cryptocrystalline, colloform concentric zonal, net-like, loop-shaped up to complete pseudomorphs.

Gold - 5 signs. It is observed:

Two signs of gold are observed in the shape of isometric oval inclusions in chalcopyrite.

Dimensions: 0.01 x 0.007 mm
0.013 x 0.005 mm.

Three signs are observed among limonite masses in the shape of flakes with uneven boundaries.

Dimensions: 0.004 x 0.001 mm
0.006 x 0.005 mm
0.003 x 0.002 mm.

Color: Bright aureate-yellow.

Microstructures: Poikilitic, interstitial.

Chalcopyrite is observed in the shape of separate grains and accumulations of grains with the dimensions of the latter being 0.5 - 0.6 mm. Chalcopyrite fills interstitial between grains of quartz and carbonate and is also observed in the shape of inclusions in gangue minerals. Chalcopyrite is subjected to a various extent replaced by hydrous ferric oxides (goethite). Some grains of chalcopyrite have a thin (approx. 0.005 mm) rim of tabular covellite.

Microstructures: Poikilitic, interstitial, relict.

Pyrite is observed among limonite masses in the shape of relict grains of irregular shape, ranging from 0.01 to 0.02 mm.

Microstructure: Relict.

Native silver is observed among limonite masses in the shape of dotted separations measuring 0.005 - 0.005 mm.

26. POLISHED SECTION 6KS227

Texture: U-shaped, carcass.

Composition: Hydrous ferric oxides and hydrous manganic oxides 60%, native silver - ten signs, gold - 2 signs, pyrite - separate grains, chalcopyrite - separate grains.

Ore mineralization is widely represented by cryptocrystalline aggregates of hydrous ferric oxides mixed with hydrous manganic oxides. Their color varies from rusty-brown to dark-drown and black, which indicates that some areas are enriched by hydrous ferric oxides and some areas - by hydrous manganic oxides.

Hydrous ferric oxides are represented by goethite and are formed as a result of oxidation of manganosiderite with formation of complete pseudomorphs on the latter.

Microstructure: Cryptocrystalline, zonal-concentric, festoony.

Hydrous manganic oxides are represented by psilomelane and pyrolusite. Psilomelane, together with goethite in the shape of dense cryptocrystalline aggregates, composed the walls of carcasses which have been formed as a result of oxidation of manganosiderites.

Pyrolusite is represented by cryptocrystalline fine-grained masses, which are located in the shape of separate layers, spots and lenses between dense masses of goethite and psilomelane. In some places pyrolusite is of oolite-like tabular composition.

Microstructure: Cryptocrystalline, fine-grained, oolitic, festoony, concentric zonal

Native silver - ten signs - is observed among quartz grains measuring 0.012 x 0.012 mm (1 sign). The most part of silver is observed among hydrous ferric and hydrous manganic oxides and is confined to fractures and cavities. The shape is oval, dimensions - from 0.002 x 0.002 mm to 0.005 x 0.004 mm, color - silvery-white.

Gold - 2 signs- is observed in the shape of small grains (0.005 x 0.006 mm) among limonite masses.

Microstructure: Interstitial

Small quantities (separate grains, 0.005 x 0.02 mm) of pyrite and chalcopyrite are observed in the shape of inclusions in quartz.

APPENDIX. 2-5

Microscopic Photographs of Polished Section

Abbreviations

Au : Native gold
Cv : Covellite
Cpy : Chalcopyrite
Goe : Goethite
Py : Pyrite
Pyr : Pyrolusite

Apx. 2-5 Microscopic Photographs of Polished Sections