第3章　ボーリング調査

3-1　ボーリング調査の概要

ボーリング調査は，Prambon地区の鉱徴地およびSeweden地区の物理探査異常域で実施した。当初のボーリング調査計画はPrambon地区の4孔のみであったが，Prambon地区のボーリング掘進と併行してSeweden地区で物理探査（IP法電気探査）を実施した結果，有望なIP異常域が把握されたため Seweden 地区で1孔を追加し計 5 孔のボーリングを実施した。総掘進長は，1,404.50m である。ボーリング孔の位置，延長等の詳細を下の表に纏めた。ボーリング位置はFig.4-1 及び Fig.4-2 に示す。

Table 4-1 Drill Hole Locations, Drilled Directions and Lengths

孔　名	地区名	UTM 座標		標高	掘進方位	傾斜	掘進長
MJIE-P1	Prambon	574596E	9121127N	636	70° 00′	-60°	250.00m
MJIE-P2	Prambon	574929E	9120250N	639	70° 00′	-60°	253.80m
MJIE-P3	Prambon	574771E	9119924N	632	250° 00′	-60°	250.00m
MJIE-P4	Prambon	574922E	9119514N	603	250° 00′	-60°	250.00m
MJIE-S1	Seweden	626604E	9087450N	238	90° 00′	-90°	400.50m
合　計							1,404.30m

Prambon地区の4孔のうち，MJIE-P2は，掘進延長 250.0m の計画であったが，予定深度付近で石英脈及び珪化帯に逢着したため，253.80mまで増掘されたが，他は計画どおりの250mの掘進長であった。

ボーリング柱状図は縮尺1：200で作成され，コアは全延長にわたってカラー写真が撮られた。また，石英脈等の発達する部分については接近撮影を行った。化学分析試料は182件採取され，Au，Ag，As，Cu，Mo，Pb，Zn，Sb，Fe，Sの10元素について乾式重量法あるいはICP発光分析により分析された。岩石薄片と鉱石研磨片が各々24件，粉末X線回折（不定方位＋石英指数）は90件，流体包有物が14件の試料が採取された。

3-2 工法・使用機器

3-2-1 工　法

表土は，HW メタルケーシングシューにより掘削され，着盤した後は，HQ ダイヤモンドコアビットと HQ－WL コアチューブをを使用して，ワイヤライン工法により掘削され，HW ケーシングパイプがほぼ 100m 付近まで挿入された。HW ケーシングパイプ挿入後孔底までの深度は NQ のダイヤモンドビットと NQ-WL コアチューブを使用して，ワイヤライン工法により掘削された。掘削用循環水には Liquid Polymer が使用された。

3-2-2 使用機器

ボーリング機械として，MJIE-P1 および MJIE-P2 にはロングイヤー社製 L-38 型試錐機と BEAM ROYAL 社製試錐ポンプで，また，MJIE-P3，MJIE-P4 および MJIE-S1 には，ロングイヤー社製 L-44 型試錐機と FMC 型試錐ポンプが使用された。ボーリング機械をはじめとする使用機器の仕様を，Table 4-2, Table 4-3 に掲載した。使用ダイヤモンドおよび消耗品については，Table 4-4，Table4-5 に掲げた。

3-2-3 作業形態

ボーリングの掘進作業は，１日３交代制（１方８時間）で行われた。機器の搬入，組み立て，搬出等の付帯作業は，１日１方で行われた。１方のクルーメンバーは，通常ボーリング技師１名，助手１名と補助作業員２名から構成された。付帯作業にはこれらのクルーメンバーの他，Prambon では約 30 名の作業員が加わって行われた。ボーリング作業用のベースキャンプは Prambon 地区では近くの Jerukgulung 集落の民家を借り上げて作られ，ベースキャンプと現場は片道徒歩で 30 分程度である。一方 Seweden 地区では近くの Seweden 集落の民家をベースキャンプとした。

3-2-4 運　搬

ボーリング資材は，Bandung から現場近くの Prambon 地区 Jerukgulung 集落までトラック運送された。その後現場までは，既存の小径を拡張もしくは新規造成を行った。Prambon 地区ではすべて人力によって運搬を行った。

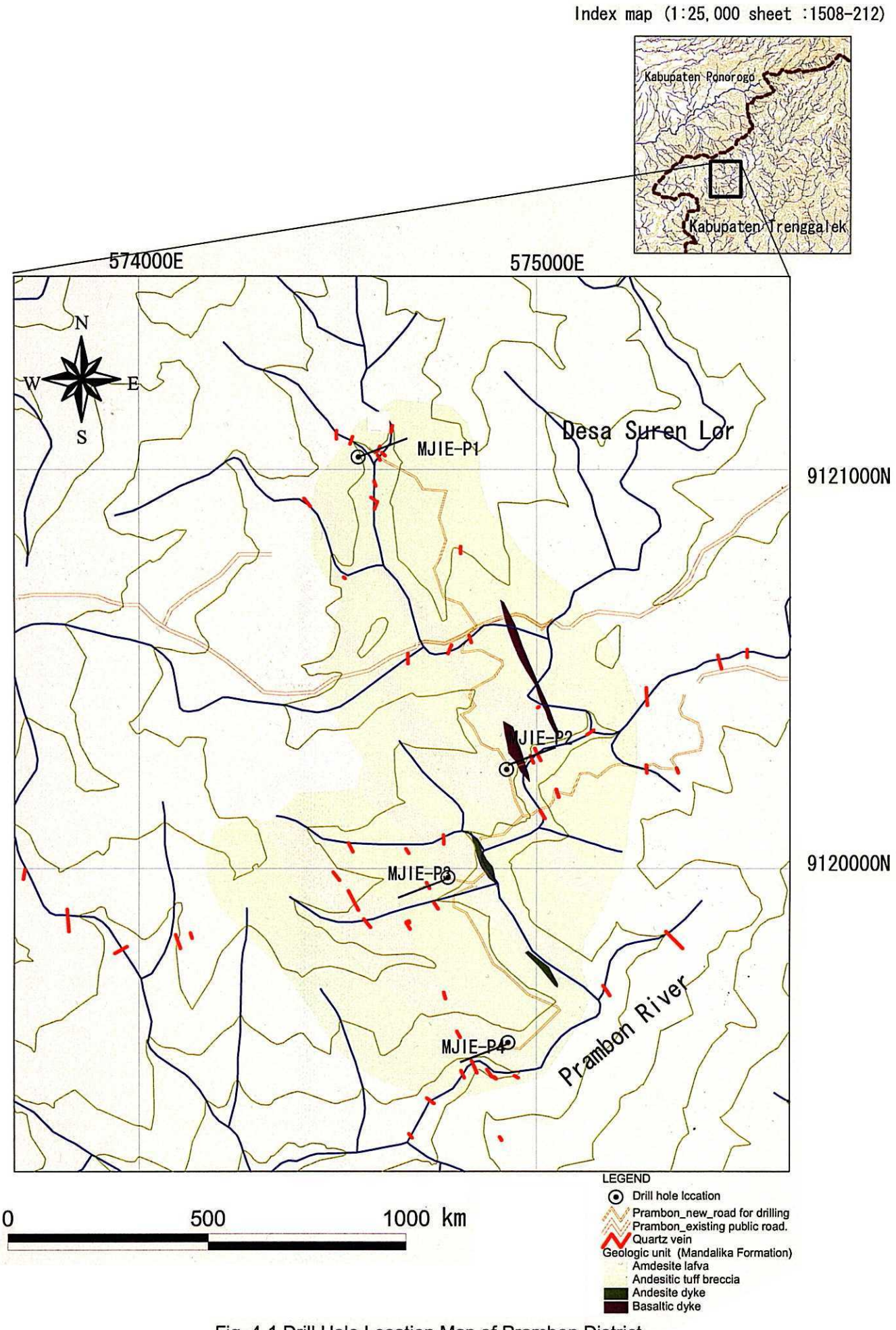


Fig. 4-1 Drill Hole Location Map of Prambon District

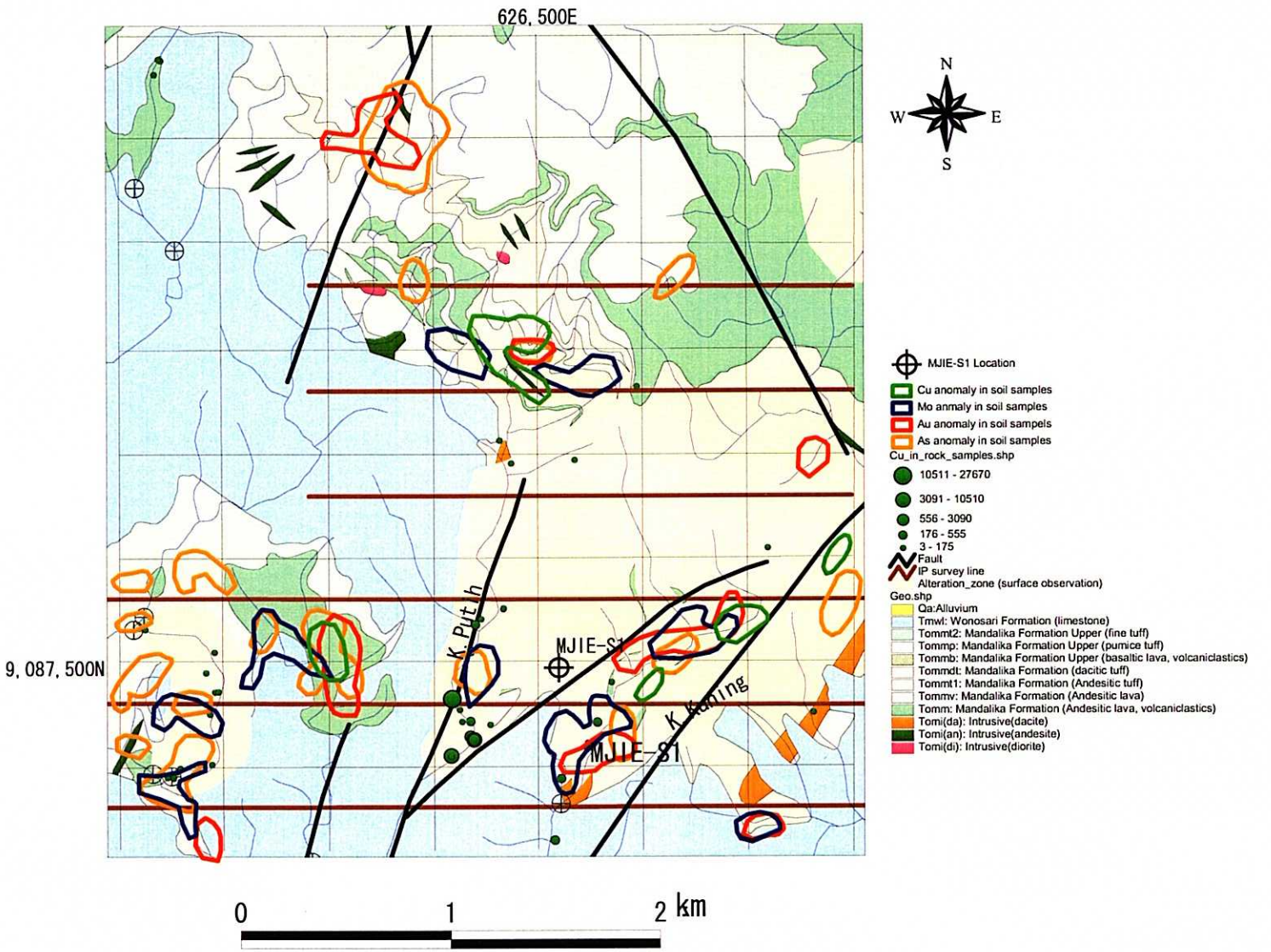


Fig.4-2 Location Map of Drill Hole MJIE-S1 in Seweden District

Table 4-2 Specification of Drilling Equipment (1)

Drilling Machine :Model L-44	1set (Serial No.425-25150)
Capacity	810m(NQ-WL)
Dimensions(L,W,H)	2,400-1,300-1,800mm
Hoisting Capacity	4,500kg
Spindle Speed	Valuable(～1600rpm)
Engine :Model Deutz	F6L/912 (Serial No.5293656)
Drilling Pump :Bean Royal Model 535RQ	1set (Serial No.-)
Pistone Diameter	70mm
Stroke	70mm
Capacity	Dischrge capacity 132 liter/mim.
Dimensione(L,M,H)	1,905-788-940mm
Engine :Model F2L/912(812380574)	11.0kW/3,000rpm
Main Hoist :Type Planetary	1set
Dimensions (Diameter,Length)	330m, 178mm
Maximum Load Capacity	7,511 daN
Wireline Hoist :Model -	1set
Specifications	L-44
Rope Capacity	500m
Motor	Hydraulic motor:max pressure 6,895kP
Hoisting Speed	～100m/min
Water Supply Pump :Model Sanchin SC-45	1set
Pistone Diameter	33.5mm
Stroke	28mm
Capacity	37 liter/min (discharge)
Weight	28kg (excluding engine)
Engine :YANMAR Model -	7.5Hp
Drilling Tools	
Drilling Rods	HQ-WL 3.0m-70 pcs
	NQ-WL 3.0m-165pcs
Casing Pioes	HW CP 3.0m-10pcs
	NW CP 3.0m-70pcs
Core Tubes	HQ-WL 3.0m-2 pcs
	NQ-WL 3.0m-2 pcs

Table 4-2 Specification of Drilling Equipment (2)

Drilling Machine :Model L-38	1set
Capacity	575m(NQ-Wireline)
Dimensions(L,W,H)	2,150-1,170-2,200mm
Weight	2,200kg
Hoisting Capacity	20,000kg
Spindle Speed	100,190,320,530 rpm
Engine :ModelF3L912	380 ps/1,800 rpm
Drilling Pump :Model FMC W1122BCD	1set (Serial No.A24539)
Pistone Diameter	70mm
Stroke	70mm
Capacity	Dischrge capacity 132 liter/mim.
Dimensione(L,M,H)	1,905-788-940mm
Engine :Model F2L/912(812380574)	11.0kW/3,000rpm
Main Hoist :Type Planetary	1set
Dimensions(Diameter,Length)	241mm, 140mm
Drum Capacity	40m (23mm Cable)
Wireline Hoist :Model -	1set
Specifications	L-38
Rope Capacity	1,280m (4.76mm cable)
Motor	Hydraulic motor:max pressure 6,895kP
Hoisting Speed	127m/min
Water Supply Pump :Model Sanchin SC-45	1set
Pistone Diameter	33.5mm
Stroke	28mm
Capacity	37 liter/min (discharge)
Weight	28kg (excluding engine)
Engine :YANMAR Model -	7.5Hp
Drilling Tools	
Drilling Rods	HQ-WL 3.0m-50 pcs
	NQ-WL 3.0m-100pcs
Casing Pioes	HW CP 3.0m-10pcs
	NW CP 3.0m-50pcs
Core Tubes	HQ-WL 3.0m-2 pcs
	NQ-WL 3.0m-2 pcs

Table 4-4 Drilling Meterage of Diamond Bits Used

Item	Size	Bit No.	Drilling Meterage /Each Bit					Total (m)
			MJIE-P1	MJIE-P2	MJIE-P3	MJIE-P4	MJIE-S1	
Bit	HQ	-	3.00	3.20	8.40	0.00	0.00	14.60
		MS-2 3819-4				98.80	111.00	209.80
		3063		24.80				24.80
		U83043G6	102.25	96.70				198.95
		U98692G6			92.60			92.60
		Sub total	105.25	124.70	101.00	98.80	111.00	540.75
	NQ	L4173		3.10	10.55			13.65
		268-202-8	144.75	126.00				270.75
		581909-6			138.45			138.45
		F-9A 221P07				151.20	177.00	328.20
		708510-6					109.65	109.65
		4553539-2					2.85	2.85
		Sub-total	144.75	129.10	149.00	151.20	289.50	863.55
	Total		250.00	253.80	250.00	250.00	400.50	1404.30

Table 4-5 Consumables Used

Expendable Items	Spec.	Unit	Drill Hole No.					Total Amount
			MJIE-P1	MJIE-P2	MJIE-P3	MJIE-P4	MJIE-S1	
Diesel Fuel		l	950	1,675	1,795	1,715	2,710	8,845
Hydraulic Oil		l	40	15	18	45	20	138
Engine Oil		l	26	48	60	16	65	215
Gear Oil		l	11	26	30	16	70	153
Grease		kg	6	7	7	7	17	44
Polymer		l	3	3	3	12	49	70
GS20		l	0	0	0	0	0	0
Lubtub		kg	0	0	0	0	0	0
Solcut		l	0	0	0	0	0	0
Stop Plus		kg	0	0	0	0	0	0
Diamond bit	HQ	pcs	1	2	2	1	1	2
	NQ	pcs	1	2	2	1	3	3
Diamond reamer	HQ	pcs	1	2	1	1	1	2
	NQ	pcs	1	2	2	1	3	3
Metal casing shoe	HQ	pcs	1	1	1	1	1	2
	NQ	pcs	1	1	1	1	1	2
Core barrel assembly	HQ	pcs	1	1	1	1	2	2
	NQ	pcs	1	1	1	1	2	2
Core lifter	HQ	pcs	1	1	1	1	3	7
	NQ	pcs	1	1	1	1	3	7
Inner tube stabilizer	HQ	pcs	1	1	1	1	2	2
	NQ	pcs	1	1	1	1	2	2
Core Box	HQ	pcs	21	26	21	20	23	111
	NQ	pcs	30	27	31	32	52	172

3-2-5 用　水

ボーリング用水は，Prambon 地区についてはボーリング地点が比較的沢に近かったため，近くの沢から容易にポンプで汲み上げられた。一方，Seweden 地区では近くの小沢は水量が不十分で，約 400m離れた沢からの汲み上げた。

3-2-6 撤　収

ボーリング終了後，機械類は往路を逆に Bandung までトラック輸送された。採取されたコアの一部は電動ロックカッターで 2 分又は 4 分し，分析及び各種試験用に採取し，残りを Bandung のカウンターパートのコア倉庫までトラック輸送した。

3-3　掘削工程

各孔の掘進工程を以下に記述する。作業時間総括（Table 4-6），掘進作業実績（Table 4-7～Table 4-11），掘進成績（Table 4-12～Table 4-16）および工程図（Fig. 4-3～Fig 4-7）をそれぞれの図表に示した。

3-3-1 Prambon 地区

(1) MJIE-P1

MJIE-P1 孔は，12 月 23 日に掘進を開始し，2004 年 1 月 4 日に掘進を終了した。

地表から 3.00mまでHWメタルケーシングシューによって掘削され，3.00 m から 105.25 m まで HQ ダイヤモンドビットを，105.25m から孔底の 250m まで HQ ダイヤモンドビットを使い，ワイヤーライン工法で掘進した。HW および NW ケーシングはそれぞれ 3.00m および 105.25m まで挿入した。

本孔の掘進速度は 1 方あたり 8.6m で，コア採取率は 96.9%であった。

(2) MJIE-P2

MJIE-P2 孔は，12 月 1 日に掘進を開始し，12 月 17 日に掘進を終了した。地表から深度 3.2 m まで HW メタルケーシングシューによって掘削され，3.2m から 124.7m まで HQ ダイヤモンドビットを，深度 124.7m から孔底の 253.8mまで NQ ダイヤモンドビットを使用しワイヤライン工法で掘進した。HW および NW ケーシングはそれぞれ 18.0m 及び 124.0m まで挿入した。

本孔の掘進速度は 1 方あたり 5.08m で，コア採取率は表層部分も含めて 96.9%であった。

(3) MJIE-P3

MJIE-P3孔は，12月3日に掘進を開始し，12月19日に掘進を終了した。

地表から8.40 mまでHWメタルケーシングシューで掘削され，8.4 mから101.0 mまでHQダイヤモンドビットを使い，深度101.0 mから孔底までNQダイヤモンドビットを使いワイヤライン工法で掘進した。HWおよびNWケーシングはそれぞれ8.4 mおよび101.0 mまで挿入した。

本孔の掘進速度は1方あたり5.21 mで，コア採取率は表層部も含めて99.4 %であった。

(4) MJIE-P4

MJIE－P4孔は，12月24日に掘進を開始し，2004年1月4日に掘進終了した。

地表から98.8 mまでHQダイヤモンドビットを使い，98.8mから孔底の250 mまではNQダイヤモンドビットを使用してワイヤーライン工法で掘進した。HWおよびNWケーシングはそれぞれ23.5mおよび98.8mまで挿入した。

本孔の掘削速度は1方あたり7.2 mで，コア採取率は96.1 %であった。

3-3-2 Seweden地区

(1) MJIE-S1

MJIE－P4孔は，2004年1月16日に掘進を開始し，2月11日に掘進終了した。

地表から111 mまでHQダイヤモンドビットを使い，111mから孔底の293.75 mまでNQダイヤモンドビットで掘進したが，掘進継続が困難となり179mまでリーミングを行い179mまでHWケーシングを挿入後400.50 mまでNQサイズﾃで掘進した。なおHWおよびNWケーシング23.5m98.8mまで挿入した。

本孔の掘削速度は1方あたり5.4 mで，コア採取率は96.4 %であった。

Table 4-6 Working Time Analysis of the Drilling Operation

Hole no.	Drilling bit size	Drilling length (m)	Core length (m)	Shift	Man working			Working Time					
				Drilling (shift)	Total (shift)	Engineer (man)	Worker (man)	Drilling (h)	Other work (h)	Recovering (h)	Establishment (h)	Dismantlement (h)	Total (h)
MJIE-P1	HQ	105.25	97.50	13	14	16	54						
	NQ	144.75	145.25	14	15	15	45						
	Total	250.00	242.75	27	29	31	99	181	20	24	39	48	312
MJIE-P2	HQ	124.70	117.65	24	26	26	78						
	NQ	129.10	128.35	21	24	24	72						
	Total	253.80	246.00	45	50	50	150	256	139	0	21	24	440
MJIE-P3	HQ	101.00	100.30	24	26	26	78						
	NQ	149.00	148.30	21	24	24	72						
	Total	250.00	248.60	45	50	50	150	277	83	24	24	8	416
MJIE-P4	HQ	98.80	88.95	16	17	17	51						
	NQ	151.20	151.20	16	18	18	54						
	Total	250.00	240.15	32	35	35	105						
Sub-total		1003.80	977.50	149	164	166	504	714	242	48	84	80	1168
MJIE-S1	HQ	111.00	103.85	27	34	40	133						
	NQ	289.50	282.45	33	48	53	198						
	Total	400.50	386.30	60	82	93	331	319	146	137	37	16	655
Grand total		1404.30	1363.80	209	246	259	835						

Table 4-7 Summary of Drilling Operation of MJIE-P1

MJIE-P1	Survey Period					Total Man-day	
Operation	Period		Day	Work Day	Off Day	Engineer	Worker
Transportation/Preparation	Dec.19-Dec.22.2003		4	4	0	12	148
Drilling	Dec.23, 2003-Jan.4, 2004		13	13	0	31	119
Dismantling	Jan.5, 2004		1	1	0	3	39
Total			18	18	0	46	306

Drilling Length	(m)		(m)
Length Planned	250.00	Overburden	7.80
Increase/Decrease in Length	0.50	Core Length	242.75
Length Drilled	250.50	Core Recovery	96.9

Working Hours	(h)	(%)	(%)
Drilling	181	80.4%	58.0%
Other Work	20	8.9%	6.4%
Recovering	24	10.7%	7.7%
Subtotal	225	100.0%	72.1%
Preparation	39		12.5%
Dismantling	24		7.7%
Transportation	24		7.7%
Grand Total	312		100.0%

Casing Pipe Inserted			
Size	Length(m)	INserted Length/Drilling Length(%)	Recovery(%)
HW	3	1.2	100
NW	105.25	42.0	100

Core Recovery of Each 100m Hole		
Depth of Hole(m)	Core Recovery (%)	Cumulative Core Recovery (%)
0.00 to 100.00	92.3	92.3
100.00 to 200.00	100.0	96.2
200.00 to 250.00	100.0	96.9

Efficiency of Drilling			
Total Length/Drilling Period	m	day	m/day
	250.00	14	19.3
Total length/Total Drilling Shifts	m	shift	m/shift
	250.00	29	8.6

Drilling Length/Each Diameter(m)		
Bit Size	Drilling Length(m)	Core Length(m)
HQ	105.25	97.50
NQ	144.75	144.75

Table 4-8 Summary of Drilling Operation of MJIE-P2

MJIE-P2	Survey Period					Total Man-day	
Operation	Period		Day	Wark Day	Off Day	Engineer	Worker
Transportation/Preparation	Nov.14-Nov.30,2003		16	9	7		
Drilling	Dec.1-Dec.17,2003		17	17	0	50	150
Dismantling	Dec.17,2003						
Total			23	26	7		
Drilling Length	(m)		(m)	Core Recovery of Each 100m Hole			
Length Planned	250.00	Overburden	3.90	Depth of Hole(m)	Core Recovery (%)	Cumulative Core Recovery (%)	
Increase/Decrease in Length	3.80	Core Length	246.00				
Length Drilled	253.80	Core Recovery	96.90	0.00 to 100.00	93.0	93.0	
Working Hours	(h)	(%)	(%)	100.00 to 200.00	99.2	96.1	
Drilling	261.67	64.73	63.63	200.00 to 253.80	100.0	96.9	
Other Work	78.25	19.36	19.03				
Recovering	64.33	15.91	15.64	Efficiency of Drilling			
Subtotal	404.25	100.00	98.30	Total Length/Drilling Period	m 253.80	day 17	m/day 14.9
Preparation	4.50		1.09				
Dismantlement	2.50		0.61	Total length/Total Drilling Shifts	m 253.80	shift 50	m/shift 5.1
Transportation							
Grand Total	411.25		100.00	Drilling Length/Each Diameter(m)			

Casing Pipe Inserted				Bit Size	Drilling Length(m)	Core Length(m)
Size	Length(m)	INserted Length/Drilling Length(%)	Recovery(%)	HQ	124.70	117.60
HW	18.00	7.1	100	NQ	129.10	128.35
NW	124.00	48.9	100			

Table 4-9 Summary of Drilling Operation of MJIE-P3

MJIE-P3	Survey Period					Total Man-day	
Operation	Period		Day	Work Day	Off Day	Engineer	Worker
Transportation/Preparation	Nov.14-Dec.2,2003		19	13	6		
Drilling	Dec.3-Dec.19,2003		17	17	0	50	150
Dismantling	Dec.19,2003						
Total			36	20	6	50	150
Drilling Length	(m)		(m)	Core Recovery of Each 100m Hole			
Length Planned	250.00	Overburden	4.70	Depth of Hole(m)	Core Recovery (%)	Cumulative Core Recovery (%)	
Increase/Decrease in Length	0	Core Length	248.60				
Length Drilled	250.00	Core Recovery	99.4	0.00 to 100.00	99.3	99.3	
Working Hours	(h)	(%)	(%)	100.00 to 200.00	99.7	99.5	
Drilling	271.75	71.37	69.55	200.00 to 250.00	99.2	99.4	
Other Work	67.5	17.73	17.27				
Recovering	41.5	10.90	10.62	Efficiency of Drilling			
Subtotal	380.75	100.00	97.44	Total Length/Drilling Period	m 250.00	day 17	m/day 14.71
Preparation	6.5		1.66				
Dismantling	3.5		0.90	Total length/Total Drilling Shifts	m 250.000	shift 48	m/shift 5.21
Transportation							
Grand Total	390.75		100.00	Drilling Length/Each Diameter(m)			

Casing Pipe Inserted				Bit Size	Drilling Length(m)	Core Length(m)
Size	Length(m)	INserted Length/Drilling Length(%)	Recovery(%)	HQ	101.00	100.30
HW	8.40	3.4	100	NQ	149.00	148.3
NW	101.00	40.4	100			

Table 4-10 Summary of Drilling Operation of MJIE-P4

MJIE-P4	Survey Period					Total Man-day	
Operation	Period		Day	Work Day	Off Day	Engineer	Worker
Transportation/Preparation	Dec.20-Dec.23,2003		4	4	0	12	151
Drilling	Dec.24,2003-Jan.4, 2004		12	12	0	35	105
Dismantling	Jan.5, 2004		1	1	0	3	30
Total	Dec.20,2003-Jan.5, 2004		17	17	0	50	286
Drilling Length	(m)		(m)	Core Recovery of Each 100m Hole			
Length Planned	250.00	Overburden		Depth of Hole(m)	Core Recovery (%)	Cumulative Core Recovery (%)	
Increase/Decrease in Length	0.00	Core Length	240.15				
Length Drilled	250.00	Core Recovery	96.06	0.00 to 100.00	90.15	90.20	
Working Hours	(h)	(%)	(%)	100.00 to 200.00	100.00	95.10	
Drilling	192	69.82	56.80	200.00 to 250.00	100.00	96.07	

Table 4-11 Summary of Drilling Operation of MJIE-S1

MJIE-S1	Survey Period				Total Man-day	
Operation	Period	Day	Work Day	Off Day	Engineer	Worker
Transportation/Preparation	Jan.13-Jan.15,2004	3	3	0	9	42
Drilling	Jan.16-Feb.11,2004	27	26	1	35	105
Dismantling	Feb.11-Feb.14,2004	3	3	0	9	42
Total	Jan.13-Feb.14,2004	33	32	1	99	314

Drilling Length	(m)		(m)
Length Planned	400.00	Overburden	3.80
Increase/Decrease in Length	0.50	Core Length	386.30
Length Drilled	400.50	Core Recovery	96.45

Working Hours	(h)	(%)	(%)
Drilling	319	52.99	49.00
Other Work	146	24.25	22.43
Recovering	137	22.76	21.04
Subtotal	602	100.00	92.47
Preparation	25		3.84
Dismantling	16		2.46
Transportation	8		
Grand Total	651		98.77

Casing Pipe Inserted			
Size	Length(m)	INserted Length/Drilling Length(%)	Recovery(%)
HW	17.9	4.5%	100
NW	171.0	42.7%	100

Core Recovery of Each 100m Hole

Depth of Hole(m)	Core Recovery (%)	Cumulative Core Recovery (%)
0.00 to 100.00	96.85	96.85
100.00 to 200.00	94.95	95.90
200.00 to 300.00	98.05	96.63
300.00 to 400.50	95.97	96.45

Efficiency of Drilling

Total Length/Drilling Period	m	day	m/day
	400.50	27	14.8
Total length/Total Drilling Shifts	m	shift	m/shift
	400.50	76	5.3

Drilling Length/Each Diameter(m)

Bit Size	Drilling Length(m)	Core Length(m)
HQ	111.00	103.85
NQ	289.5	282.45

Table 4-12 Record of Drilling Operation of MJIE-P1

Date	Drilling Length			Daily Tortal				shift		Man Warking	
	Shift 1 (m)	Shift 2 (m)	Shift 3 (m)	Drilling (m)	Drilling (Cum.m)	Core Length (m)	Core Length (Cum.m)	Drilling (Shift)	Total (Shift)	Engineer (man)	Warker (man)
Dec. 19	Transportation									3	34
Dec. 20	Transportation									3	34
Dec. 21	Transportation									3	39
Dec. 22	Set up									3	39
Dec. 23		3.00		3.00	3.00			1	1	3	12
Dec. 24		8.80	7.60	16.40	19.40	12.80	12.80	2	2	2	12
Dec. 25	6.75	5.70	8.90	21.35	40.75	20.20	33.00	3	3	3	12
Dec. 26		9.55	10.10	19.65	60.40	19.65	52.65	2	2	2	12
Dec. 27		10.45	11.00	21.45	81.85	21.45	74.10	2	2	2	12
Dec. 28		7.65	8.15	15.80	97.65	15.80	89.90	2	2	2	12
Dec. 29		7.60		7.60	105.25	7.60	97.50	1	2	2	12
Dec. 30		4.45	9.00	13.45	118.70	13.45	110.95	2	2	2	12
Dec. 31		11.65	11.80	23.45	142.15	23.45	134.40	2	2	2	12
Jan. 1	12.00	7.85	10.70	30.55	172.70	30.55	164.95	3	3	3	13
Jan. 2	12.00	12.00	6.00	30.00	202.70	30.00	194.95	3	3	3	13
Jan. 3	9.00	9.00	18.00	36.00	238.70	36.00	230.95	3	3	3	13
Jan. 4	11.80			11.80	250.50	11.80	242.75	1	2	2	13
Jan. 5										3	39
Jan. 6											

Table 4-13 Record of Drilling Operation of MJIE-P2

Date	Drilling Length			Daily Tortal				shift		Man Warking	
	Shift 1	Shift 2	Shift 3	Drilling		Core Length		Drilling	Total	Engineer	Warker
	(m)	(m)	(m)	(m)	(Cum.m)	(m)	(Cum.m)	(Shift)	(Shift)	(man)	(man)
Dec. 1		3.20	3.35	6.55	6.55	3.85	3.85	2	2	2	6
Dec. 2	2.25	1.20	8.50	11.95	18.50	7.95	11.80	3	3	3	9
Dec. 3	4.95	3.40	2.40	10.75	29.25	10.50	22.30	3	3	3	9
Dec. 4	4.35	4.80	4.80	13.95	43.20	13.95	36.25	3	3	3	9
Dec. 5	7.20	6.10	2.80	16.10	59.30	16.10	52.35	3	3	3	9
Dec. 6		5.05	7.20	12.25	71.55	12.25	64.60	3	3	3	9
Dec. 7	6.10	9.85	8.00	23.95	95.50	23.95	88.55	3	3	3	9
Dec. 8	6.50	7.15	7.80	21.45	116.95	21.35	109.90	3	3	3	9
Dec. 9	1.10	6.65		7.75	124.70	7.75	117.65	3	3	3	9
Dec. 10			1.50	1.50	126.20	1.50	119.15	3	3	3	9
Dec. 11	1.60	2.90	7.55	12.05	138.25	11.30	130.45	3	3	3	9
Dec. 12	9.05	3.50	9.00	21.55	159.80	21.55	152.00	3	3	3	9
Dec. 13	7.00	9.00	6.80	22.80	182.60	22.80	174.80	3	3	3	9
Dec. 14	5.45	8.75	8.40	22.60	205.20	22.60	197.40	3	3	3	9
Dec. 15	9.25	6.05	6.30	21.60	226.80	21.60	219.00	3	3	3	9
Dec. 16	8.35	6.05	6.00	20.40	247.20	20.40	239.40	3	3	3	9
Dec. 17	3.00	3.60		6.60	253.80	6.60	246.00	3	3	3	9
Dec. 18								0	1	3	9

Table 4-14 Record of Drilling Operation of MJIE-P3

Date	Drilling Length			Daily Tortal				shift		Man Warking	
	Shift 1	Shift 2	Shift 3	Drilling		Core Length		Drilling	Total	Engineer	Warker
	(m)	(m)	(m)	(m)	(Cum.m)	(m)	(Cum.m)	(Shift)	(Shift)	(man)	(man)
Dec.3		4.00	2.00	6.00	6.00	5.40	5.40	2	2	2	6
Dec.4	2.40	1.60	5.00	9.00	15.00	8.90	14.30	3	3	3	9
Dec.5	2.05	6.95	4.60	13.60	28.60	13.60	27.90	3	3	3	9
Dec.6	5.05	4.15	5.30	14.50	43.10	14.50	42.40	3	3	3	9
Dec.7	1.70	2.60	1.80	6.10	49.20	4.30	46.70	3	3	3	9
Dec.8	3.50	7.95	6.15	17.60	66.80	19.40	66.10	3	3	3	9
Dec.9	1.50	5.50	7.70	14.70	80.60	13.80	79.90	3	3	3	9
Dec.10	5.20	6.10	6.45	17.75	98.35	17.75	97.65	3	3	3	9
Dec.11	2.65			2.65	101.00	2.65	100.30	3	3	3	9
Dec.12	2.65		4.35	7.00	108.00	6.90	107.20	3	3	3	9
Dec.13	2.55	2.80	7.10	12.45	120.45	12.45	119.65	3	3	3	9
Dec.14	10.35	14.40	6.30	31.05	151.50	30.85	150.50	3	3	3	9
Dec.15	10.10	11.65	9.80	31.55	183.05	31.55	182.05	3	3	3	9
Dec.16	8.50	6.40	7.95	22.85	205.90	22.85	204.90	3	3	3	9
Dec.17	5.10	9.05	3.60	17.75	223.65	17.75	222.65	3	3	3	9
Dec.18	11.60	9.40	3.00	24.00	247.65	23.60	246.25	3	3	3	9
Dec.19	2.35			2.35	250.00	2.35	248.60	3	3	3	9
Dec.20											

Table 4-15 Record of Drilling Operation of MJIE-P4

Date	Drilling Length			Daily Tortal				shift		Man Warking	
	Shift 1	Shift 2	Shift 3	Drilling		Core Length		Drilling	Total	Engineer	Warker
	(m)	(m)	(m)	(m)	(Cum.m)	(m)	(Cum.m)	(Shift)	(Shift)	(man)	(man)
Dec. 20	Trabsportation									3	16
Dec. 21	Trabsportation									3	16
Dec. 22	Trabsportation									3	16
Dec. 23	Set up									3	16
Dec. 24		9.00	7.80	16.80	16.80	7.45	7.45	2	2	2	8
Dec. 25	5.30	2.55		7.85	24.65	7.85	15.30	2	3	3	11
Dec. 26	1.95	5.30	4.80	12.05	36.70	12.05	27.35	3	3	3	11
Dec. 27	3.70	1.65	5.95	11.30	48.00	11.30	38.65	3	3	3	11
Dec. 28	10.70	12.10	5.00	27.80	72.80	27.80	66.45	3	3	3	11
Dec. 29	6.00	11.30	5.70	23.00	98.80	23.00	88.95	3	3	3	11
Dec. 30		1.85	0.80	2.65	101.45	2.65	91.60	2	3	3	11
Dec. 31	8.20	11.10	6.90	26.20	127.65	26.20	117.80	3	3	3	11
Jan. 1	15.00	12.00	16.20	43.20	170.85	43.20	161.00	3	3	3	11
Jan. 2	2.75		8.05	10.80	181.65	10.80	171.80	2	3	3	11

Table 4-16 Record of Drilling Operation of MJIE-S1

Date	Drilling Length			Daily Tortal				shift		Man Warking	
	Shift 1	Shift 2	Shift 3	Drilling		Core Length		Drilling	Total	Engineer	Warker
	(m)	(m)	(m)	(m)	(Cum.m)	(m)	(Cum.m)	(Shift)	(Shift)	(man)	(man)
Jan. 13	Trabsportation									3	8
Jan. 14	Set up									3	9
Jan. 15	Set up									3	9
Jan. 16		8.00	9.90	17.90	17.90	13.90	13.90	2	2	3	9
Jan. 17	0.00	0.00	0.00	0.00	17.90	0.00	13.90	3	3	2	9
Jan. 18	0.00	0.00	0.00	0.00	17.90	0.00	13.90	3	3	3	9
Jan. 19	2.70	9.50	13.90	26.10	44.00	24.45	38.35	3	3	3	9
Jan. 20	12.00	15.00	6.00	33.00	77.00	32.50	70.85	3	3	3	9
Jan. 21	3.00	19.00	4.60	26.60	103.60	26.00	96.85	3	3	3	11
Jan. 22	1.10	1.10	0.00	2.20	105.80	2.00	98.85	3	3	3	11
Jan. 23	5.20	0.00	0.00	5.20	111.00	5.00	103.85	3	3	3	11
Jan. 24	4.25	7.70	7.90	19.85	130.85	18.80	122.65	3	3	3	11
Jan. 25	8.50	9.20	7.00	24.70	155.55	24.70	147.35	3	3	3	11
Jan. 26	11.05	18.25	10.50	39.80	195.35	39.80	187.15	3	3	3	11
Jan. 27	12.20	6.50	11.95	30.65	226.00	30.65	217.80	3	3	3	11
Jan. 28	10.90	7.95	12.00	30.85	256.85	30.35	248.15	3	3	3	11
Jan. 29	13.25	4.75	8.50	26.50	283.35	25.45	273.60	3	3	3	11
Jan. 30	4.65	0.00	0.00	4.65	288.00	4.25	277.85	3	3	3	11
Jan. 31	0.00	2.85		2.85	290.85	2.85	280.70	2	2	2	8
Feb. 1				0.00	290.85	0.00	280.70	0	0	0	0
Feb. 2		1.00	1.90	2.90	293.75	2.90	283.60	2	2	2	8
Feb. 3	0.00	0.00	0.00	0.00	293.75	0.00	283.60	3	3	3	11
Feb. 4	0.00	0.00	0.00	0.00	293.75	0.00	283.60	3	3	3	11
Feb. 5	1.00	6.50	6.60	14.10	307.85	14.10	297.70	3	3	3	11
Feb. 6	9.50	6.90	5.80	22.20	330.05	22.20	319.90	3	3	3	11
Feb. 7	3.65	5.50	4.35	13.50	343.55	13.50	333.40	3	3	3	11
Feb. 8	7.45	7.85	3.20	18.50	362.05	18.50	351.90	3	3	3	11
Feb. 9	8.35	10.10	5.35	23.80	385.85	23.80	375.70	3	3	3	11
Feb. 10	6.95	5.20	0.00	12.15	398.00	8.90	384.60	3	3	3	11
Feb. 11	0.00	0.00	2.50	2.50	400.50	1.70	386.30	3	3	3	11
Feb. 12	Dismantling							0	1	3	8
Feb. 13	Dismantling Reclamation							0	1	3	8
Feb. 14	Reclamation							0	1	3	8

3-4 ボーリング孔の地質

各ボーリング孔の縮尺 1/200 柱状図（Table 4-21～Table 4-25），化学分析結果（Table 4-26，Table 4-31），岩石薄片検鏡結果（Table 4-27，Table 4-32），X 線回折結果（Table 4-28，Table 4-33），鉱石研磨片検鏡結果（Table 4-29，Table 4-34）及び流体包有物測定結果（Table 4-30，Table 4-35）は本章末に示した。

3-4-1 Prambon 地区

(1) MJIE-P1

[地質]

- 0-7.85 m 表土
- 7.85-17.55 m：斑状安山岩（岩脈？），緑色化変質のみ。暗緑色～灰緑色，コンパクト。最大径約 10mm の輝石斑晶を含む。シリカが充填した杏仁状空隙が顕著。
- 17.55-22.00 m：安山岩質凝灰角礫岩-火山礫凝灰岩。灰緑色，石質，塊状，やや軟質。
- 22.00-25.70 m：斑状安山岩（岩脈？）暗緑色～灰緑色，コンパクト。最大径約 5mm の輝石斑晶を含む。
- 22.70-55.50 m：安山岩質凝灰角礫岩。灰緑色，変質作用により一部白色を呈する。最大 5 cm 程度の角礫を含む。
- 55.50-82.70 m:：細粒安山岩。灰緑色，一部弱珪化作用・破砕作用を蒙っている。
- 82.70-89.40 m：鉱化帯。
- 89.40-138.80 m：安山岩質凝灰角礫岩，一部-火山礫凝灰岩サイズ。灰緑色，淡緑色で塊状，比較的コンパクト。
- 138.80-150.20 m：暗緑色の安山岩，塊状，コンパクト，溶岩？
- 150.20-159.25 m：火山礫凝灰岩。淡緑色，塊状，コンパクト。
- 159.20-164.50 m：細粒凝灰岩，コンパクトであるが一部破砕されている。
- 164.50-210.25 m：安山岩質凝灰角礫岩-火山礫凝灰岩。緑色の石質（安山岩）角礫が多いが少量の赤色あるいは暗緑色～黒色の角礫を含有する。
- 210.25-211.50：細粒安山岩。珪化作用により灰色を呈する。コンパクト。貫入岩と推定される。

・ 211.50-250.00 m：安山岩質凝灰角礫岩，一部-火山礫凝灰岩サイズ。灰緑色，淡緑色で塊状，比較的。最大 5 cm 程度の角礫を含む。（222.50-223.00 m 及び 237.00-27.40 間の安山岩は粗粒の本質礫と推定される。

[変質作用]

・ 7.85-17.50 m：非変質ないし弱変質作用を蒙り緑色を呈する。.
・ 17.50-21.80 m：緑色化変質作用
・ 21.80-22.45 m：微弱な珪化作用
・ 25.55-27.05 m：灰色～白色粘土.
・ 27.05-29.55 m：弱粘土化変質作用（脱色）
・ 29.55-39.80 m：緑色化変質作用（プロピライト化変質作用）
・ 39.80-41.65 m：粘土化変質作用。中程度。
・ 41.65-47.30 m：強粘土化・珪化変質作用を蒙っている。とくに 41.75-44.00 m 間が強く経過作用を蒙っている。
・ 47.30-55.50 m：中～弱粘土化変質作用。
・ 55.50-61.60 m: プロピライト化（緑色化）変質作用～弱珪化変質。
・ 61.50-66.20 m：中～強い珪化作用。このうち 66.85-66.05 m 間もっとも強い珪化作用をこうむっている。
・ 66.20-82.70 m：弱～中程度の珪化作用。このうち， 70.95-71.15 m 及び 73.75-74.45 m 間が最も強く珪化作用・黄鉄鉱の鉱染を伴っている。一方，78.30-79.25 m 間の安山岩は非変質である。
・ 82.70-89.40 m：中から弱い珪化作用及び強い粘土化変質作用をこうむっている。このうち 87.90- 89.40 m：間が最も強い変質作用・黄鉄鉱の鉱染を伴う。
・ 89.40-98.15 m：弱粘土化変質作用。
・ 98.15-104.85 m：弱粘土化及び珪化変質作用。このうち，102.95-103.85 m:間は強く黄鉄鉱が鉱染している。
・ 104.85-116.60 m：プロピライト化変質作用～非変質。
・ 116.60-118.60 m：粘土化変質作用および弱い珪化変質作用。
・ 118.60-138.80 m：緑色化変質作用（プロピライト化？）
・ 138.80-151.20 m：非変質作用～微弱プロピライト化変質作用？
・ 151.20-164.50 m：緑色化変質作用（微弱変質作用？）
・ 164.50-166.35 m：中～弱い珪化変質作用。黄鉄鉱が強く鉱染している。

・ 166.35-250.00 m:：弱い変質作用。（暗緑色，プロピライト化？）一部，非判質の黒色安山岩角礫を含有する。

[鉱化作用]

MJIE-P1 は黄鉄鉱鉱染を伴う珪化ゾーンのほか石英細脈に逢着した。すなわち，41.75m～44.00m(2.25m)，46.95m～47.40m(0.45m),52.75m～53.05m(0.30m)，70.95m～71.15m(0.20m),73.75m～74.45m(0.70m)等の珪化・粘土化ゾーンである。

これらのうち，下記のゾーンが優勢と判断され化学分析用の試料を採取した。

・ 39.75-55.50 m：強～中～弱い粘土化・珪化変質作用を蒙っている。このうち，41.65-47.40 m がもっとも強く珪化変質作用を蒙っている。一方，黄鉄鉱は 50.55-53.05 m 間がもっとも強く鉱染している。

・ 61.50-82.70 m：弱～中～強度の珪化ゾーン。このうち，66.85-66.05 m, 70.95-71.15 m 及び 73.75-74.45 m がもっとも強い珪化しており黄鉄鉱の鉱染も強い。

・82.70-89.40 m：弱～中～強度の珪化ゾーン。このうち，87.90- 89.40 m がもっとも強い珪化しており黄鉄鉱の鉱染も強い。このうち，87.90m～89.30m(交角 30° 掘進幅 1.40m)がやや強い珪化・粘土化・黄鉄鉱鉱染ゾーンである。

・ 164.50-166.20 m 弱～中程度の珪化ゾーン。黄鉄鉱の鉱染は強い。.うち，165.25m～165.80m(交角 30° 掘進巾 0.55m):やや強い珪化・粘土化・黄鉄鉱鉱染ゾーンである。

Table 4-17 Major Intercepts of MJIE-P1

No.	Depth (m)	Drilled Length (m)	Mineralization	Au (ppb)	Ag (ppm)
1	41.65-47.40	5.75	Strongly silicified zone (highest: 43.90-44.55m (0.65m) 4,915ppb)	727	3.1
2	50.55-53.05	2.50	Moderately argillic altered zone with pyrite veinlets	186	3.1
3	68.60-68.90	0.30	Quartz-calcite veining in strongly pyrite disseminated part in silicified zone	219	4.0
4	70.85-71.35	0.50	Strongly-moderately silicified zone	156	3.3
5	73.63-74.82	1.19	Strongly silicified and pyrite disseminated zone	94	3.1
6	82.70-89.40	6.70	Strongly silicified with quartz veining zone (highest: 88.80～89.40m(0.60m) 10,420 ppb)	1,062	39.3
7	165.25-166.25	1.00	Moderately silicified, pyrite strongly disseminated zone	340	1.7

(2) MJIE-P2

[地質]

・0-3.90 m：表土

・3.90-18.50 m 風化した安山岩（サプロライト）

・18.50-36.50 m：安山岩

・36.50-140.00 m：安山岩質凝灰角礫岩。一部（102.40 m～124.20m）は火山礫サイズの礫が多いがその境界は漸移である。全体として緑色～灰緑色で塊状・コンパクトである。なお。暗緑色の角礫を 60.55-61.05 m.及び 119.35-120.15 m に，また斑状の安山岩角礫を 123.10-124.10 m に含有する。このうち下部は安山岩質自破砕状溶岩を含むと推定される。

・140.00-176.00 m：自破砕状安山岩。緑色～暗緑色-暗灰色を呈し，コンパクトで比較的堅硬である。

・ 176.00-187.60 m：強く粘土化作用・珪化作用を蒙っており原岩の組織は不明である。

・ 187.60-201.35 m: 細粒安山岩。暗灰色～淡緑色を呈するコンパクトな岩石である。198.35-201.35 m 間は珪化作用を蒙っている。

・ 201.35-213.80 m：安山岩（自破砕状溶岩)。緑色，一部変質作用により脱色。

・ 213.80-222.30 m：安山岩質凝灰角礫岩。灰色ないし緑色の細粒凝灰岩層を挟む。

・ 222.30m ～229.20m：安山岩溶岩

・229.20m ～253.80m 安山岩質凝灰角礫岩。241.60-243.00 及び 250.80-253.00 m:は淡緑色を呈する安山岩（の岩塊)。253.00m～253.80m は細粒凝灰岩層。

[変質作用]

・ 3.90-18.15 m：風化変質.

・ 18.15-32.60 m：弱粘土化及び珪化変質

・ 32.60-93.60 m：緑色化変質（弱プロピライト化）55.20-55.26 m 及び 82.4-82.65 m は弱粘土化変質及び珪化変質。

・ 93.60-97.80 m：強い粘土化及び珪化変質ゾーン

・ 97.80-162.27 m：プロピライト化変質作用。細い珪化，粘土化ゾーンを挟む。

・ 162.70-188.70 m：粘土化・珪化ゾーン。黄鉄鉱鉱染が強い。

・ 188.70-198.35 m：プロピライト化変質作用。

・ 198.35-208.43 m：粘土化・珪化ゾーン。黄鉄鉱鉱染。

・ 208.43-244.20 m：プロピライト化変質作用。

・ 244.20-250.60 m：粘土化・珪化ゾーン。黄鉄鉱鉱染。
・ 250.60-253.80 m プロピライト化変質作用。一部弱い粘土化。

[鉱化作用]

MJIE-P2 は，幅の広く黄鉄鉱が鉱染した粘土化・珪化ゾーンを貫いたほか，石英・方解石の細脈が胚胎しているのを確認した。これらのうち，以下のゾーンを化学分析に供した。

・ 55.20m（真幅 1cm）白色石英脈。39.75-55.50 m は強弱の差はあるが粘土化・珪化変質作用を蒙り石英細脈を伴う。このうち，41.65-47.40 間は珪化作用を強く蒙り，50.55-53.05 m は黄鉄鉱鉱染が強い。
・ 82.65m（真幅 8cm）白色石英脈
・ 84.50m（真幅 2cm）白色石英脈。84.50-84.52 m: 区間 84.50-84.65 m (0.20 cm)の Au 分析値は 97ppbAu。.
・90.55m（真幅 1cm）白色石英脈
・ ・94.85-97.80m（掘進幅 2.95m,交角シャープでないが 40° 程度）幅 40cm の白色石英脈を含む珪化・粘土化ゾーン。分析値の区間平均は 164ppbAu で，このうち白色石英（95.23-95.64 cm ：0.41 m)は 306ppbAu であった。.
・130.70m 真幅 2cm 石英脈
・130.70-131.45 m：強い粘土化・珪化変質ゾーン。このうち石英脈を伴い強く珪化作用を蒙った 131.13-131.45 m 間の分析値は 181ppb Au であった。
・159.60-159.66 m：白色石英細脈。116 ppb Au。
・161.45-161.49 m：白色石英細脈。265 ppb Au。
・164.87-165.25 m：白色石英細脈。167 ppb Au。
・167.90～170.35m(掘進幅 2.45m。交角不明だが真幅 1.2m 程度と推定。)：粘土を主体とした粘土化・珪化・含石英（14cm）脈ゾーン。このうち最も珪化作用が強い 168.70-169.55 m が 153 ppbAu，粘土化が強い 169.55-170.30 m は 14ppb Au であった。
・ ・176.00～188.70m(掘進幅 11.70m。交角 30° ～40° →推定真幅 5.8m)：灰色を呈する粘土・珪化ゾーンで，粘土ゾーンは珪化岩の角礫を含有し，珪化ゾーンは細粒黄鉄鉱を含有する。また，幅 45cm の白色石英脈を伴うほか 1 cm 程度の石英細脈が珪化ゾーンの随所に認められる。Au 最高値は 185.00-186.00 m 間の 347ppb Au で，一方，最大幅の石英脈（0.80 m）は 28 ppbAu と低い。.
・198.35～203.71m(掘進幅 5.36m。交角約 40°)：粘土化・珪化・含石英方解石脈（最大 45cm）ゾーン。このうち，強く粘土化・珪化した区間 198.35-205.25 m の平均値は 233ppb Au で，最高は 201.35-202.00 m 間の 1,035 ppbAu であった。

・207.65～208.45m(掘進幅 0.80m。交角約 40°)：珪化ゾーン。区間 207.65-208.70m の分析値は 56 ppb Au である。

・245.70～250.60m(幅 4.90m。交角約 40°)：粘土化・珪化ゾーンで石英細脈を伴う。区間 245.70-250.63 の分析値は 189ppbAu であった。

・245.70～246.90m(1.2m)：珪化角礫を伴う粘土ゾーン。

・246.90～248.40m(1.5m)：強珪化ゾーン（黄鉄鉱鉱染状～細脈状）

・248.40～250.60m(2.2m)：粘土～中珪化ゾーン

・異常のほか，珪化・粘土脈の上下盤の 10 cm 幅で採取した 6 試料の分析結果は 19～ 80 ppb Au であった。

Table 4-18 Major Intercepts of MJIE-P2

No.	Depth (m)	Drilled Length (m)	Mineralization	Au (ppb)	Ag (ppm)
1	82.45-82.65	0.20	Argllic zone with quartz veining	153	1.7
2	84.50-84.58	0.08	Quartz vein	97	0.8
3	94.85-97.80	2.95	Argillic silicified zone with quartz veining	164	16.6
4	131.13-131.45	0.32	Argillic silicified zone with quartz veining	181	2.2
5	159.60-159.66	0.06	Quartz vein	116	9.8
6	161.45-161.49	0.04	Quartz vein	265	10.8
7	164.87-165.25	0.38	Quartz vein	167	2.3
8	168.70-170.30	1.60	Argillic silicified zone with quartz veining	141	2.7
9	177.00-188.70	11.70	Argillic silicified zone with quartz veining	138	4.7
	including 185.00-187.00 (2.00m) 340ppb				
10	198.35-205.25	6.90	Argillic silicified zone with quartz veining	233	3.7
	including 201.35-202.00 (0.65m) 1,035ppb				
11	207.65-208.55	0.90	Argillic silicified zone with quartz veining	56	1.7
12	245.70-250.63	4.93	Argillic silicified.zone with quartz veining	189	3.4

(3) MJIE-P3

[地質]

- 0～4.70m：表土
- 4.70～23.20m：安山岩質凝灰角礫岩
- 23.20m～26.70m：安山岩
- 26.70～58.35m：安山岩質凝灰角礫岩
- 58.35～59.70m，安山岩，灰緑色，コンパクト
- 59.70m～71.60m：安山岩質凝灰角礫岩
- 71.60m～125.00m：安山岩質自破砕溶岩
- 125.00m～133.05m：安山岩質凝灰角礫岩
- 133.05m～150.50m：安山岩，灰緑色，細粒，コンパクト，緑泥石に充填されたガス孔顕著。
- 150.05m～200.65m：安山岩質凝灰角礫岩（206～217mに安山岩溶岩？を3枚挟む。）
- 200.65m～204.75m：安山岩溶岩（一部角礫化）
- 200.45m～206.35m：安山岩質凝灰角礫岩
- 206.35m～208.60m：安山岩。暗灰色，コンパクトで堅硬（溶岩？）
- 208.60m～210.50m：細粒凝灰岩
- 210.50m～247.95m：安山岩溶岩。灰緑色，コンパクトで堅硬。
- 247.95m～250.00m：安山岩質凝灰角礫岩

[変質作用]

- 0 m～15.00 m：風化変質
- 26.70 m～31.30 m：弱プロピライト化変質
- 31.30 m～46.00 m：弱粘土化変質。31.30-31.70 m, 33.60-33.61 m, 34.70-34.90 m, 41.40-42.60 m及び43.32-43.55 m間では軟質な粘土化変質。
- 46.00 m～90.60m：弱プロピライト化変質
- 90.60m～133.50m：（微弱プロピライト化）変質。
- 133.50m～217.05m：非変質～微弱プロピライト化。ただし，167.00-167.60 m, 172.85-173.25 m, 174.03-175.55 m及び182.50-182.90 m間で弱い粘土化作用を蒙っている
- 217m～250.00m：緑色化変質（微弱プロピライト化）。。

[鉱化作用]
本孔は2ゾーン：
①31.45～31.75m，41.40～42.60mの強粘土化ゾーン　及び
②172.85m～175.55m間で弱い淡緑色粘土化ゾーン
に逢着，それぞれ地表での鉱徴に対応すると考えられるが，黄鉄鉱の鉱染，方解石細脈を伴うものの微弱な鉱化作用である。なお，172.85m～175.55m 間の弱い淡緑色粘土化ゾーンは172.85m～173.25m, 174.20m～174.50m, 175.00m～175.55mの3ゾーンが弱い淡緑色粘土化ゾーンで方解石細脈，弱い黄鉄鉱鉱染を伴う。珪化作用は微弱。

その他の着鉱は：

- 43.25m：真幅4cmの白色石英脈
- 79.40 m～80.60m(掘進幅 1.2m)に粘土化ゾーン（黄鉄鉱鉱染弱）
- 91.85cm：幅2cmの石英・赤鉄鉱・磁鉄鉱細脈
- 167.00-167.60 m：破砕帯
- 182.50-182.90 m: 破砕帯弱粘土化帯
- 241.20～241.40m：2cm幅の白色石英を伴う弱粘土化（緑色）が認められるが，黄鉄鉱鉱染はほとんどなく鉱化作用を伴わない粘土化作用とみられる。

Table 4-19 Major Intercepts of MJIE-P3

No.	Depth(m)	Drilled Length (m)	Mineralization	Au(ppb)	Ag(ppm)
1	41.25-41.50	0.25	argllic zone	821	23.3
	41.50-42.47	0.97	argllic zone	83	4.2
	42.47-43.20	0.73	argllic-silicified zone	14	2.4
	42.20-43.55	1.35	argllic zone with quartz veinlets	139	2.5
	Average	3.30		147	4.6
2	172.90-173.35	0.45	argllic zone	39	0.3
	173.35-174.20	0.85	weak argillic zone	11	0.5
	174.20-174.50	0.30	argllic zone	55	0.2
	174.50-175.00	0.50	weak argillic zone	21	0.4
	175.00-175.50	0.50	argllic zone	19	0.2
	Average	2.60		24	0.35

(4) MJIE-P4

[地質]

- 0-7.60 m：表土.
- 7.60-46.25 m：安山岩 (7.60-18.35 m 間は風化)。塊状，淡緑色，一部破砕。
- 46.25-76.30 m：安山岩質凝灰角礫岩。緑色の火山礫，岩塊が密に占め，マトリックスは少ない。
- 76.30-131.65 m：自破砕状安山岩質溶岩
- 131.65-133.00 m 火山礫凝灰岩
- 133.00-163.60 m：自破砕状安山岩質溶岩
- 163.60-164.13 m：火山礫凝灰岩
- 164.13-192.15 m：自破砕状安山岩質溶岩
- 192.15-192.90 m：火山礫凝灰岩
- 192.90-198.15 m：安山岩
- 198.15-204.35 m：安山岩質凝灰角礫岩

- 204.35-213.65 m：安山岩，一部破砕質。
- 213.65-226.00 m：安山岩質凝灰角礫岩
- 226.00-229.65 m：安山岩。細粒で淡緑色を呈する。
- 229.65-234.55 m：安山岩質凝灰角礫岩。塊状だが一部弱い層理を示す。
- 234.55-235.35 m：細粒凝灰岩
- 235.35-241.15 m：凝灰角礫岩，粗粒凝灰岩層を挟む。
- 241.15-245.20 m：細粒凝灰岩
- 245.20-250.00 m：安山岩質凝灰角礫岩。緑色，コンパクト，塊状。

[変質作用]

- 7.60-18.35 m：風化変質
- 18.35-156.30：プロピライト化変質
- 78.60-136.07 m：粘土化・珪化変質
- 156.30-156.80 m粘土化変質
- 156.80-239.35 m：プロピライト変質
- 239.35-241.15 m：粘土化・珪化変質
- 241.15-250.00 m：プロピライト化変質

[鉱化作用]

顕著な鉱化ゾーンには逢着しなかったが，下記のゾーンに金鉱化作用が認められる。

・135.95m(交角 45° 掘進巾 0.18m)石英・黄鉄鉱脈

・156.30m（交角 30° 掘進巾 0.50m）石英・方解石・黄鉄鉱脈

Table 4-20 Major Intercepts of MJIE-P4

No.	Depth(m)	Drilled Length(m)	Mineralization	Au(ppb)	Ag(ppm)
1	78.60-79.10	0.50	Silicification Argillic alteration	222	3.6
2	135.80-136.07	0.27	Banded clay-pyrite Silicified zone	52	2.0
3	156.33-156.95	0.62	Quartz stockwork Silicification	107	6.1
4	239.65-241.10	0.82	Silicification Quartz-calcite veinlets	54	0.5

3-4-2 Seweden 地区

(1) MJIE-S1

[地質]

・3.90m　着盤

・3.90-37.30m：全体として白色で赤色の鉄酸化鉱物が不規則な縞状を呈する。原岩は凝灰角礫岩と推定される。

・37.30m-101.00m：：灰色黄鉄鉱鉱染（中-強）粘土化変質帯。このうち，37.30-44.00m 及び 57.50m-101.00m は断層粘土帯と推定され軟質粘土である。)断層粘土帯は灰色（黄鉄鉱鉱染）軟質粘土で，一部（64.2-65.0m，69.9-71.6m，74.0-77.2m）にやや堅い（岩石として体をなす）区間があり，これらの区間は，黄鉄鉱が強-中程度に鉱染した暗灰色粘土化変質岩で，原岩は不詳であるが細粒火砕岩と推定される。（上記の断層運動は，黄鉄鉱鉱染変質作用とは一連ではなく，新しい断層と推定される。）

・101.00-105.25m：強～中程度の黄鉄鉱鉱染した暗灰色粘土化変質岩である。
（軟質粘土部も若干伴う。）

・105.25m～106.90m：断層粘土帯と推定される灰色（黄鉄鉱鉱染）軟質粘土。
（37.30～106.90m：断層のなか？）

・106.90～115.80m：強く黄鉄鉱鉱染した暗灰色～帯緑色の粘土化変質岩(原岩：安山岩）である。このうち，115.70m～115.80m は細粒な急冷縁とみられ，この区間は貫入岩と推定される。

・115.80～119.85m：やや軟質の細粒～粗粒凝灰岩。

・119.85-121.20m：安山岩質ないし玄武岩質の貫入岩。淡緑色でやや細粒・コンパクトで，変質作用を蒙っているがオフィチック構造が残存している。
・121.20m～137.20m：砂質～粗粒凝灰岩。125.10-125.85 m, 127.85-17.95 m, 130.45-130.85 m 及び133.15-133.25 m 間は軟質粘土である。
・137.20～144.65m：中～強程度の黄鉄鉱鉱染した暗灰色～帯緑色の粘土化変質岩(原岩：安山岩)である。（133.15-133.25 m は軟質粘土。）
・144.65～167.55m：中-強程度に黄鉄鉱鉱染した灰色，一部帯緑色の火山礫凝灰岩－凝灰角礫（ただし，164.50～167.55m は軟質粘土。）
・167.55～213.85m：中-（強）程度に黄鉄鉱鉱染した帯緑色の火山礫凝灰岩－凝灰角礫岩，比較的堅硬で軟質粘土化ゾーンは限定されている。（193.70～194.95m：粘土化変質岩）なお，211m付近の緑色鉱物（緑泥石）＋白色鉱物（？）のなかに微量ではあるが（おそらく初生ではない）磁鉄鉱様黒色細粒鉱物が散点している。
・213.25～216.65m：安山岩（淡緑色～灰緑色，塊状，コンパクト)。・黄鉄鉱鉱染：中-強。プロピライト化変質作用に弱い白色粘土化変質作用がオーバープリントしているような観を呈する。
・216.65～246.45m：火山礫凝灰岩－凝灰角礫岩。黄鉄鉱鉱染：中-強。
・246.45～248.85m:細粒～砂質凝灰岩。灰色，上下の火山礫凝灰岩－凝灰角礫岩に比べやや堅硬で強く変質作用を蒙っている。
・ 248.85～274.00m：凝灰角礫岩。灰色。
・ 274.00～279.75m：凝灰岩，灰色で墨流し状の黒色の縞模様を呈する。
・ 279.75～285.15m：安山岩。変質作用により白色～淡挑色を呈するが均質で塊状岩。
・ 285.15～289.10m：凝灰角礫岩。灰色でやや堅硬な部分と粘土化が強い部分が混交している。
・ 289.10～326.90m：灰色～淡挑色を示すコンパクトでやや堅硬な強変質岩。一部で破砕・粘土化作用を蒙っている。黄鉄鉱鉱染強し。
・ 329.60～374.40m：凝灰角礫岩。プロピライト化変質作用を蒙り緑色を呈するが，さらに後の白色化変質作用を蒙り，緑色部を白色部が不規則網状（霜降り状）に交代している観を呈する。白色部には磁鉄鉱の微粒が散点から脈状に生成している。一部(338.75-339.20m, 351.02-351.60m)，暗緑色を呈するが，安山岩の角礫か貫入岩である。
・ 374.40～391.85m：灰色～淡挑色を示すコンパクトでやや堅硬な強変質岩。原岩は安山岩～細粒閃緑岩と推定される。
・ 391.85～400.50m：緑色～灰緑色を示す凝灰角礫岩。このうち，393.00～395.00m 間の弱変質した緑色岩は閃緑岩質の貫入岩の可能性があるが，395.00-398.50m 間は軟質粘土及び粘土化変質岩で原岩は不詳である。

[変質作用]

上記の地質で記載したとおり，掘進全区間を通し，変質作用を蒙っている。大別すると以下のようになる。

- 3.90-37.30 m：溶脱型の珪化変質。上部はカオリン鉱物が卓越するが，下部は鉄酸化鉱物を伴う珪化作用が卓越する。
- 37.30m-167.55 m：中-強程度に黄鉄鉱鉱染した灰色の粘土化変質。断層破砕帯で軟質粘土ゾーンのほかやや硬質の緑色の火山礫凝灰岩－凝灰角礫岩がある。164.50-166.55m は軟質粘土。
- 167.55-211.00 m：中-（強）程度に黄鉄鉱鉱染した帯緑色の火山礫凝灰岩－凝灰角礫岩，比較的堅硬で軟質粘土化ゾーンは限定されている。（193.70-194.95m：粘土化変質岩）
- 213.25-222.85 m：プロピライト化変質作用に弱い白色粘土化変質作用がオーバープリントしているような観を呈する。
- 222.85-289.15 m:粘土化変質作用が強くなり灰色を呈し，ひんぱんに角礫化・軟質粘土ゾーンが賦存している（軟質粘土ゾーン：225.00-225.80m, 228.25-228.50m, 232.85-233.65m, 234.10-234.20 m)。Sericite-quartz alteration
- 222.85-289.15 m:断層破砕帯
- 289.15m-330.70 m:白色粘土化変質で，セリサイト・石英・黄鉄鉱からなる。
- 330.70m～398.50 m:プロピライト化変質により後期の白色粘土化変質作用が重複している。394.95m～398.50 m 間は軟質の断層粘土。
- 398.50m～400.50 m：白色粘土化変質で，セリサイト・石英・黄鉄鉱からなる。

[鉱化作用]

地表下 37.30 m:までは風化作用による二次酸化帯である。銅及び金は孔底付近でやや高い分析値を示すがそれ以外では鉱化作用を示唆するほど高い値を示さない。また，黄鉄鉱は 37.30m以深で普遍的に分布するが粘土化帯でやや強く，プロピライト化帯でやや弱いが，その強さは変質帯により明確な差はない。なお，わずかにモリブデナイトを伴う黄鉄鉱・粘土細脈が孔底付近に１条認められる。

3-5 まとめ

3-5-1 Prambon 地区

(1) 地質

Prambon 地区での４孔のボーリングはいずれも Mandalika 層の安山岩質溶岩・火山砕屑岩からなり,貫入岩も安山岩質でほぼ同時期の貫入と推定される。溶岩・火山砕屑岩は一般に塊状で地層の走向傾斜は推定が難であるが，交角から緩傾斜と推定され，地質調査の結果と総合すると NW-SE 走向で N 傾斜と推定される。したがって，南部のほうが下位の地層が露出している可能性がある。

(2) 変質作用

安山岩質溶岩・火山砕屑岩は広く緑色化変質作用を蒙っている。しかし，４孔とも鉱化変質作用に逢着したが，北部の MJIE-P1 及び MJIE-P2 では珪化・粘土化変質ゾーンの幅が広く発達し，南部では変質ゾーンの幅が比較的狭い。

(3) 鉱化作用

分析の結果，金品位は最高 MJIE-1 孔で 10.4g/t で，1～5g/tAu が 3 試料，一般には 1g/t 以下と高い分析値は少なかった。しかし，検鏡の結果，16 試料のうち 14 試料中に方鉛鉱，閃亜鉛鉱または黄銅鉱が検出され，金鉱化作用はこれらの鉱物と関係があることが示唆される。MJIE-P2 の試料（P2-25P:183.2m)からは針銀鉱 Acanthite が黄鉄鉱中に生成している。

また，脈際の変質鉱物・脈石鉱物として石英のほかセリサイト，方解石が多く同定されている。

流体包有物の測定の結果，温度は 200℃前後が多く，塩濃度も低い。

以上のことからこれらはいずれも浅熱水性の鉱化作用が本地区に広く発達すると考えられる。

3-5-2 Seweden 地区

(1) 地質

Seweden 地区のボーリングの地質は Mandalika 層の火山岩及び火山砕屑岩からなる。また，貫入岩は安山岩質から閃緑岩質である。このうち，火山砕屑岩がもっとも卓越し，主として凝灰角礫岩からなり，一部で火山礫凝灰岩から細粒凝灰岩を挟在する。一般に塊状で地層の走向傾斜は推定が難である。地質調査の結果と総合すると NW-SE 走向で S 傾斜と推定される。したがって，南部のほうが上位の地層が露出している可能性がある。本孔は多くの断層粘土帯に逢着しており，これらは地質調査により推定した ENE-WSW 系の断層に対比される。

(2) 変質作用

本孔の安山岩質溶岩・火山砕屑岩は粘土化変質作用あるいは，緑色化変質作用を蒙っている。このうち粘土化変質ゾーンは，地表近くの酸化帯直下（掘進深度 37.3m）から孔底まで広く発

達し，プロピライト化変質作用は，167.55 m～222.85 m 及び 330.65 m～398.50 m で発達する。このうち 330.65 m～398.50 m のプロピライト化変質ゾーンはさらにセリサイト化変質作用が重複して蒙っている。これらの変質作用はさらに断層破砕帯の粘土化作用を蒙っている。

(3) 鉱化作用

本孔では黄鉄鉱が広く散点状から脈状に分布している。また，深部では磁鉄鉱が黄鉄鉱を交代したりあるいは黄鉄鉱脈に切られたりして比較的多量に生成している。磁鉄鉱の発達するゾーンではセリサイトが発達している。本孔では石英脈はほとんど認められず，黄鉄鉱セリサイト（磁鉄鉱）細脈が広く分布する。

しかし，顕著な銅鉱化作用は認められず，わずかに本孔下部で 100ppm を超えるゾーンが発達するのみである。しかし，同じく下部では 20ppb 前後と弱いながら金の鉱化作用が下方で強くなる傾向を示している。また，下部には１条であるが，モリブデンの細脈に逢着している。

以上のことから本孔は浅熱水性の中熱水性の鉱化作用を合わせたような特徴を有する。したがって，本孔周辺にポーフィリーカッパー鉱床タイプの鉱化変質作用が発達する可能性はあると考えられる。

(4)充電率・比抵抗測定結果と鉱化作用との関係

物理探査の結果，測線 2 及び測線 3 の深部に東西 2 列の高充電率ゾーンが地下深部で期待され，このうち西側のゾーンに MJIE-S1 が掘進された。MJIE-S1 では深度 37.30m～400.50mでほぼ連続して比較的強い黄鉄鉱の鉱染が認められ，これらの鉱染帯が高充電率の原因と推定される。しかし，地表近くからの黄鉄鉱の鉱染は 37.30m～168 m まで及び 223m～330 m までの白色変質帯で比較的強く，プロピライト化帯で比較的弱く，強弱の変化があるが充電率測定結果は深部で順次高くなるとなっている。これは電極間隔が 200m であり，その分解能から細部の変化を把握するのが困難であるためと考えられ，充電率の解析結果は妥当と考えれ，したがって，孔底では又，白色変質が認められ，解析結果が示唆するとおりさらに地下深部で黄鉄鉱の鉱染が強がる可能性がある。

Fig.4-3 Work Progress of Drill Hole MJIE-P1 in Prambon District

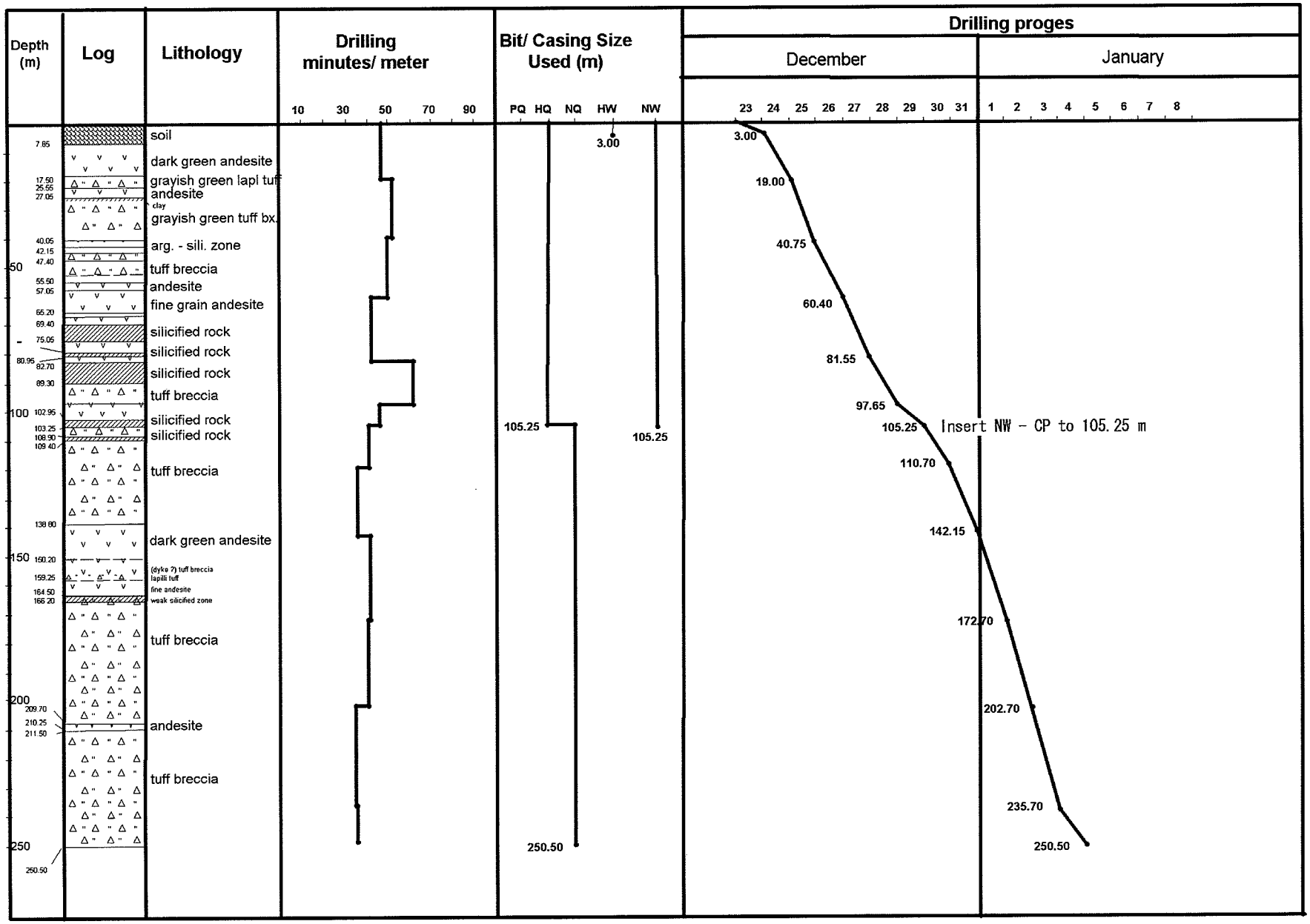


Fig.4-4 Work Progress of Drill Hole MJIE-P2 in Prambon District

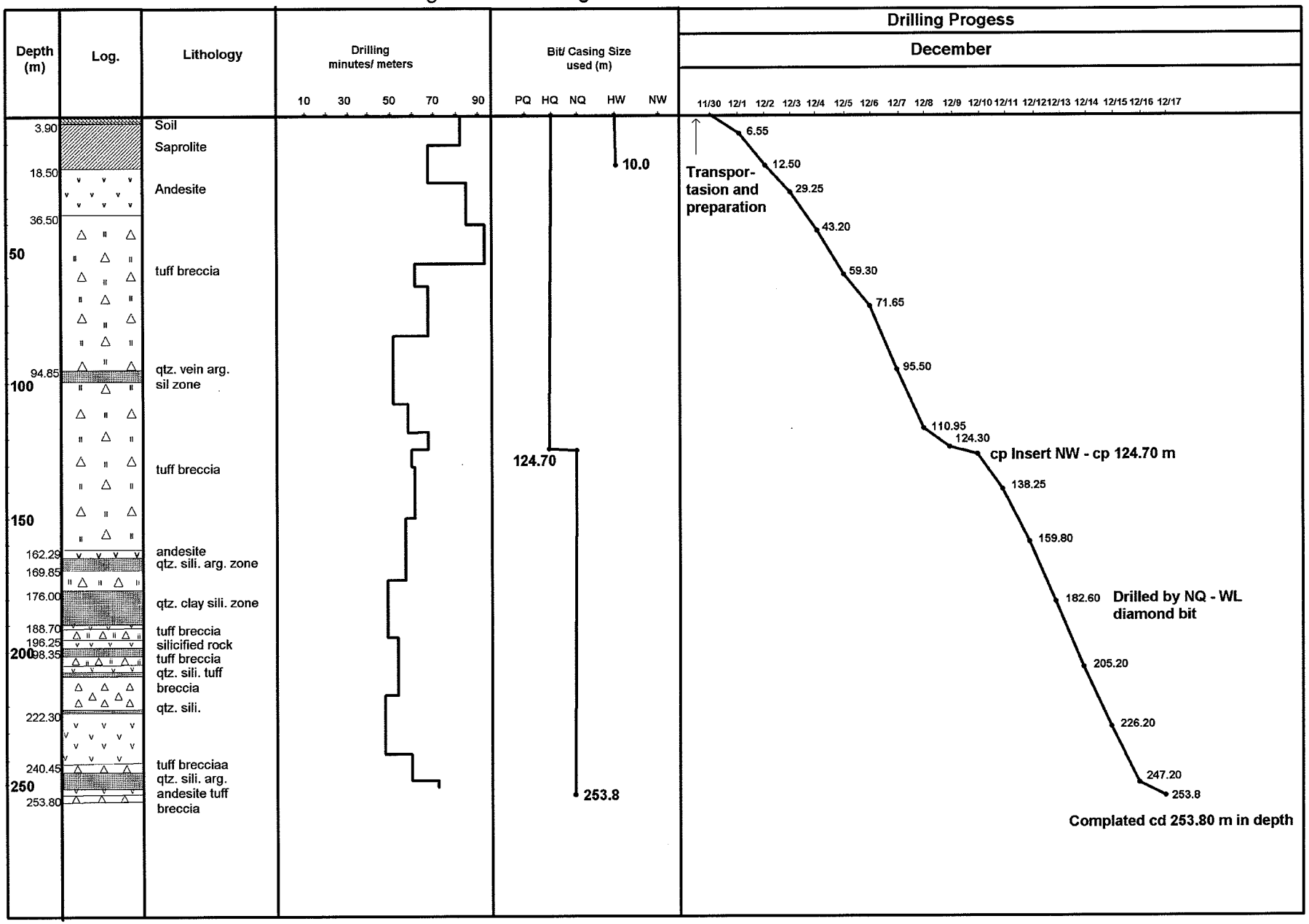


Fig.4-5 Work Progress of Drill Hole MJIE-P3 in Prambon District

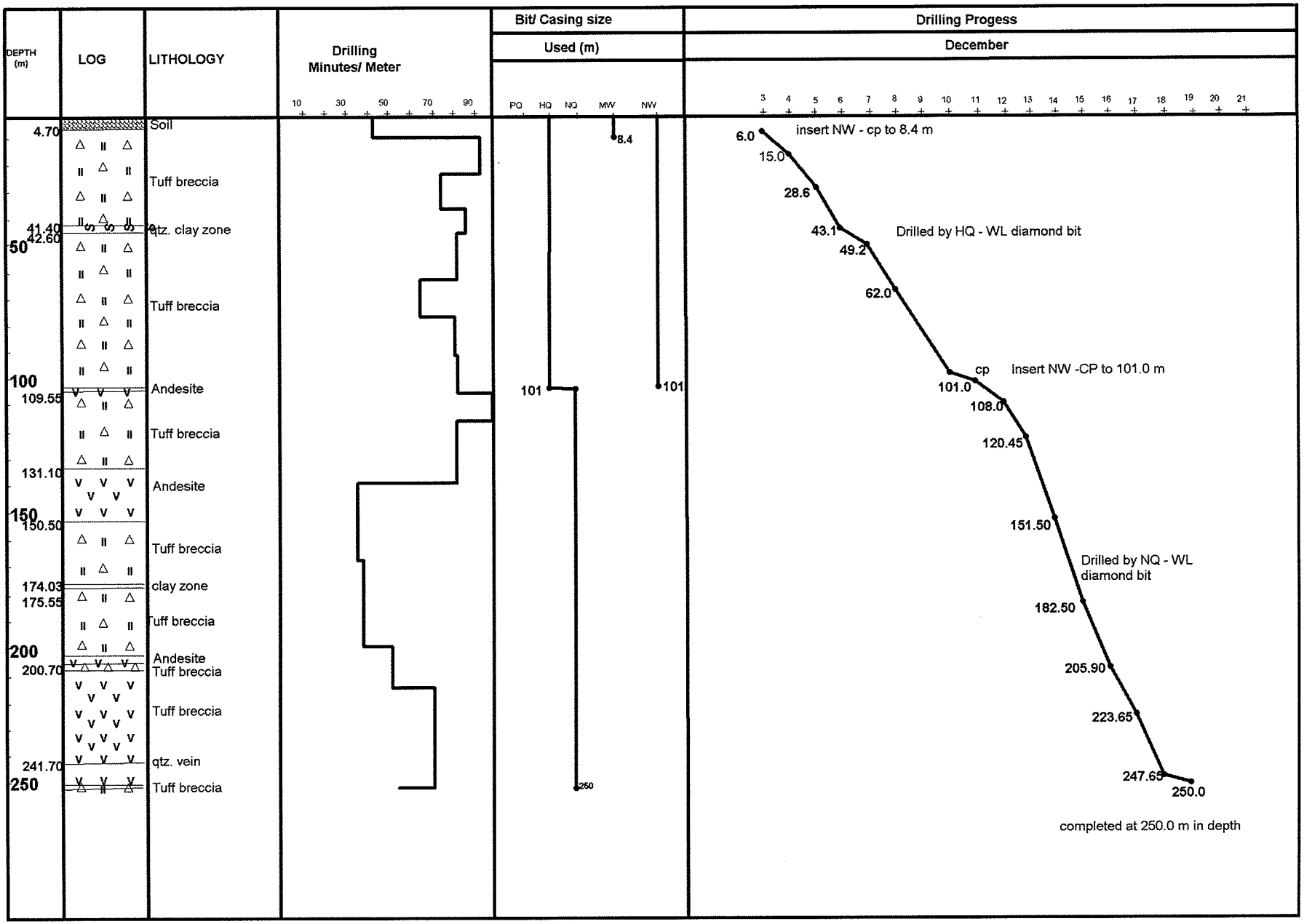


Fig.4-6Work Progress of Drill Hole MJIE-P4 in Prambon District

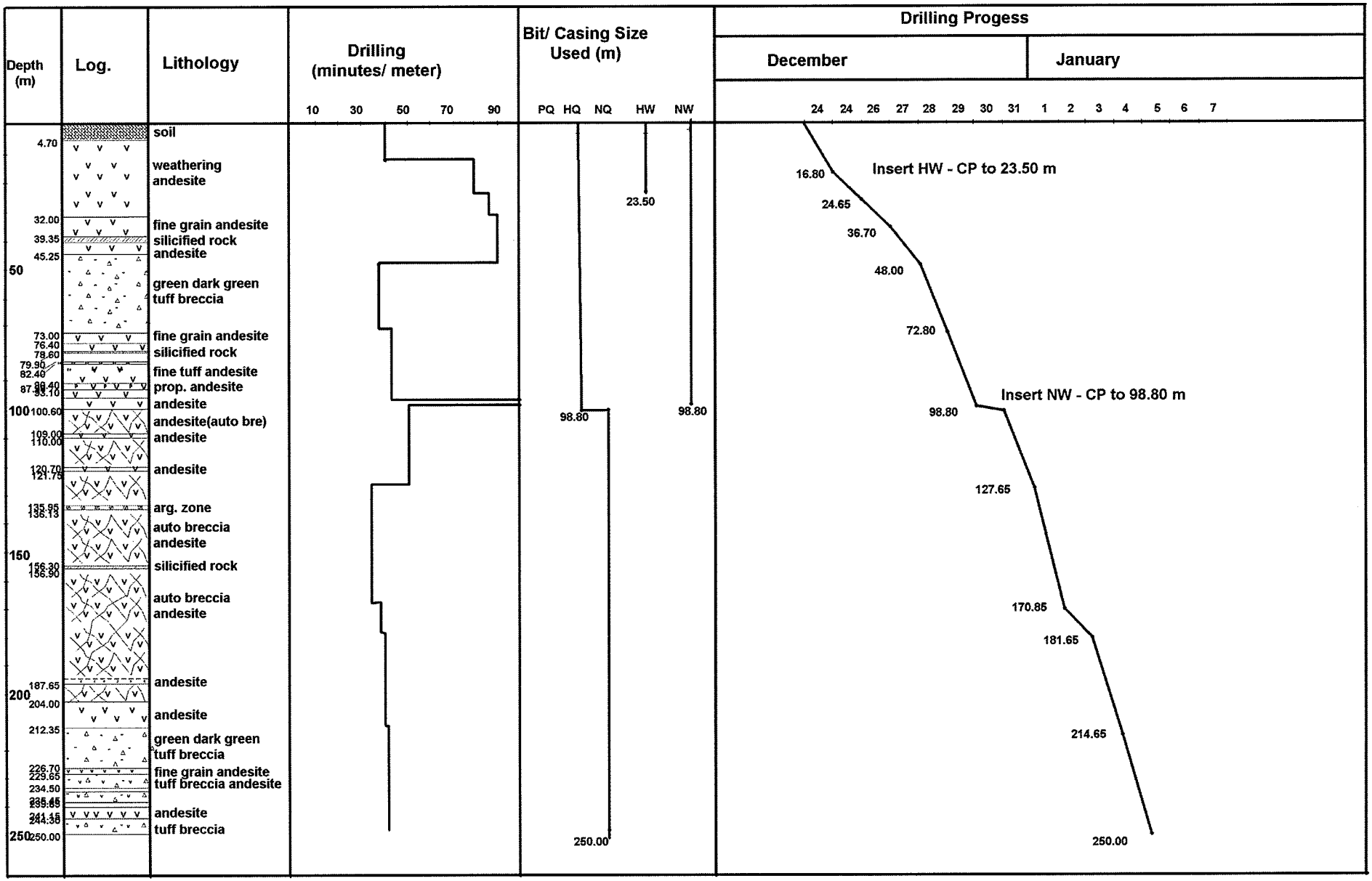
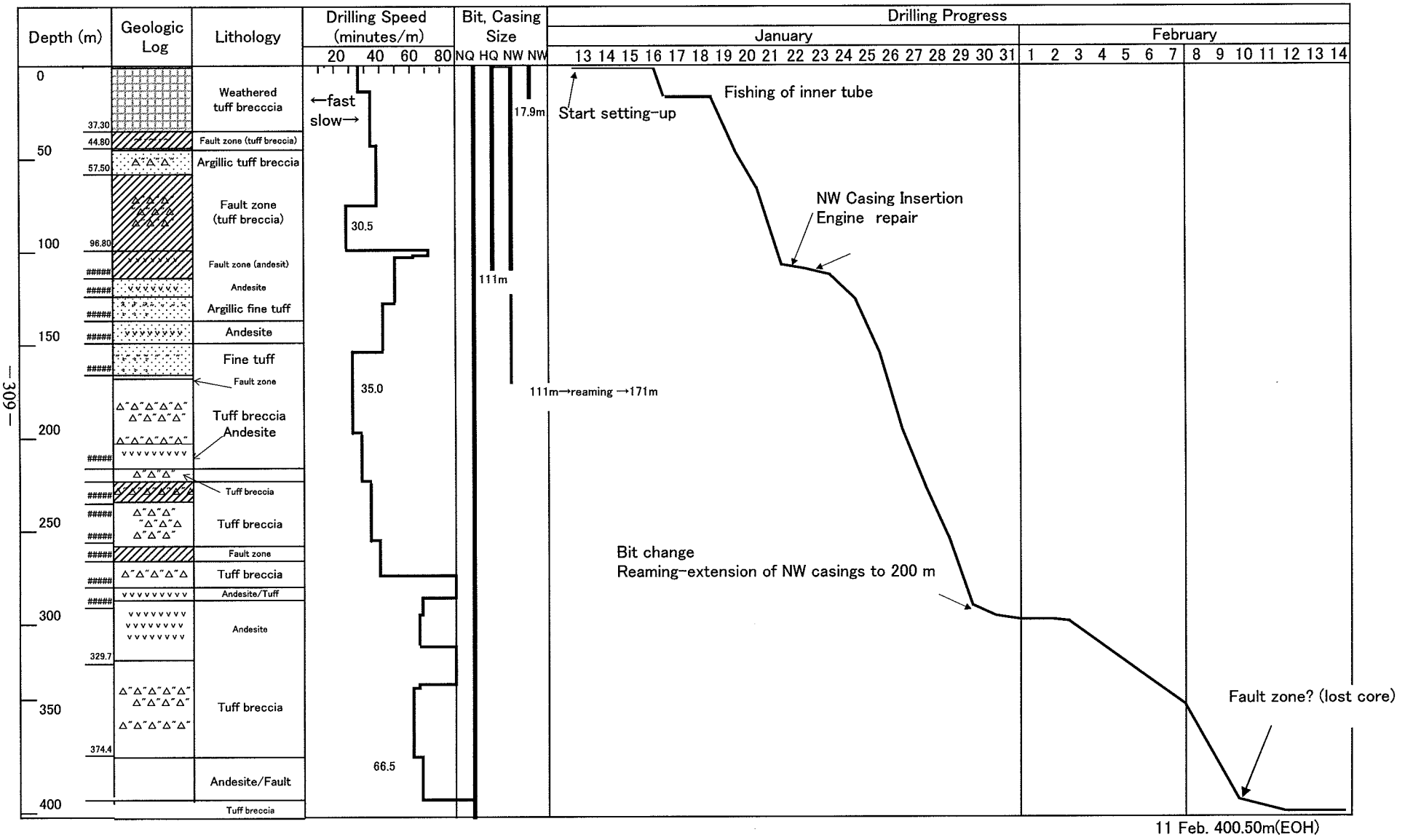


Fig. 4-7 Work Progress of Drill Hole MJIE-S1in Seweden District



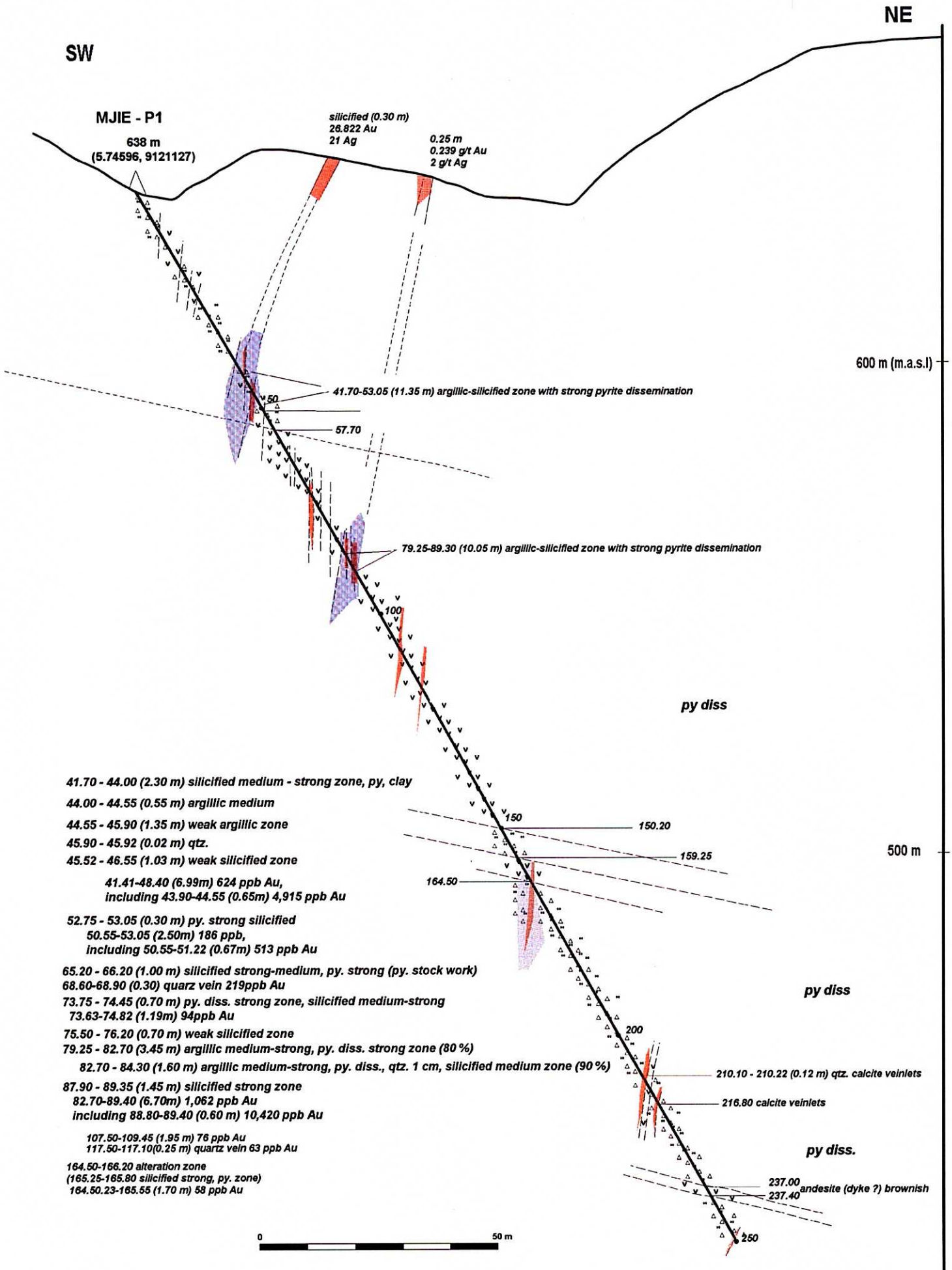


Fig. 4-8 Geolgic Profile of Drill Hole MJIE-P1 in Prambon District

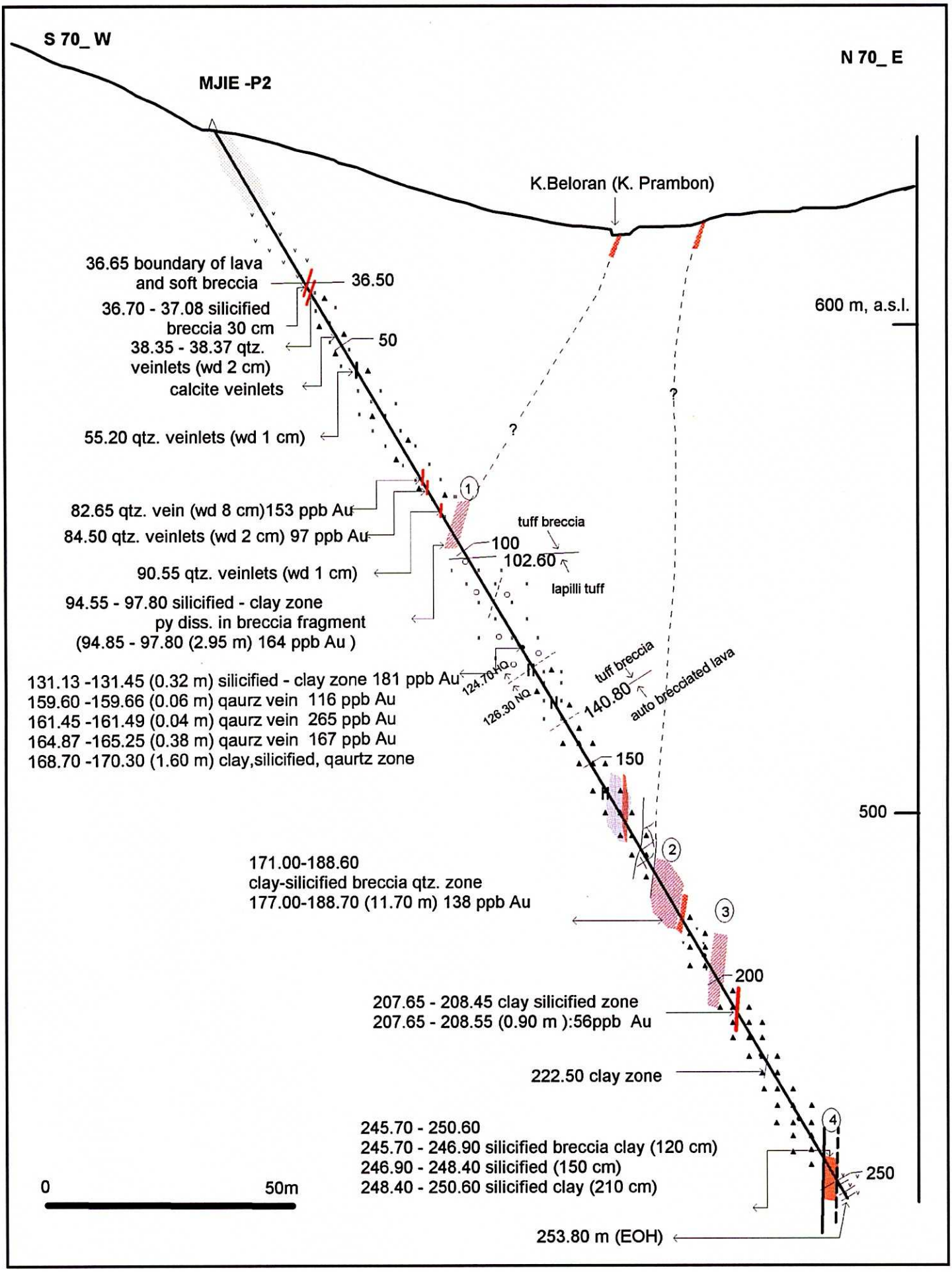


Fig. 4-9 Geolgic Profile of Drill Hole MJIE-P2 in Prambon District

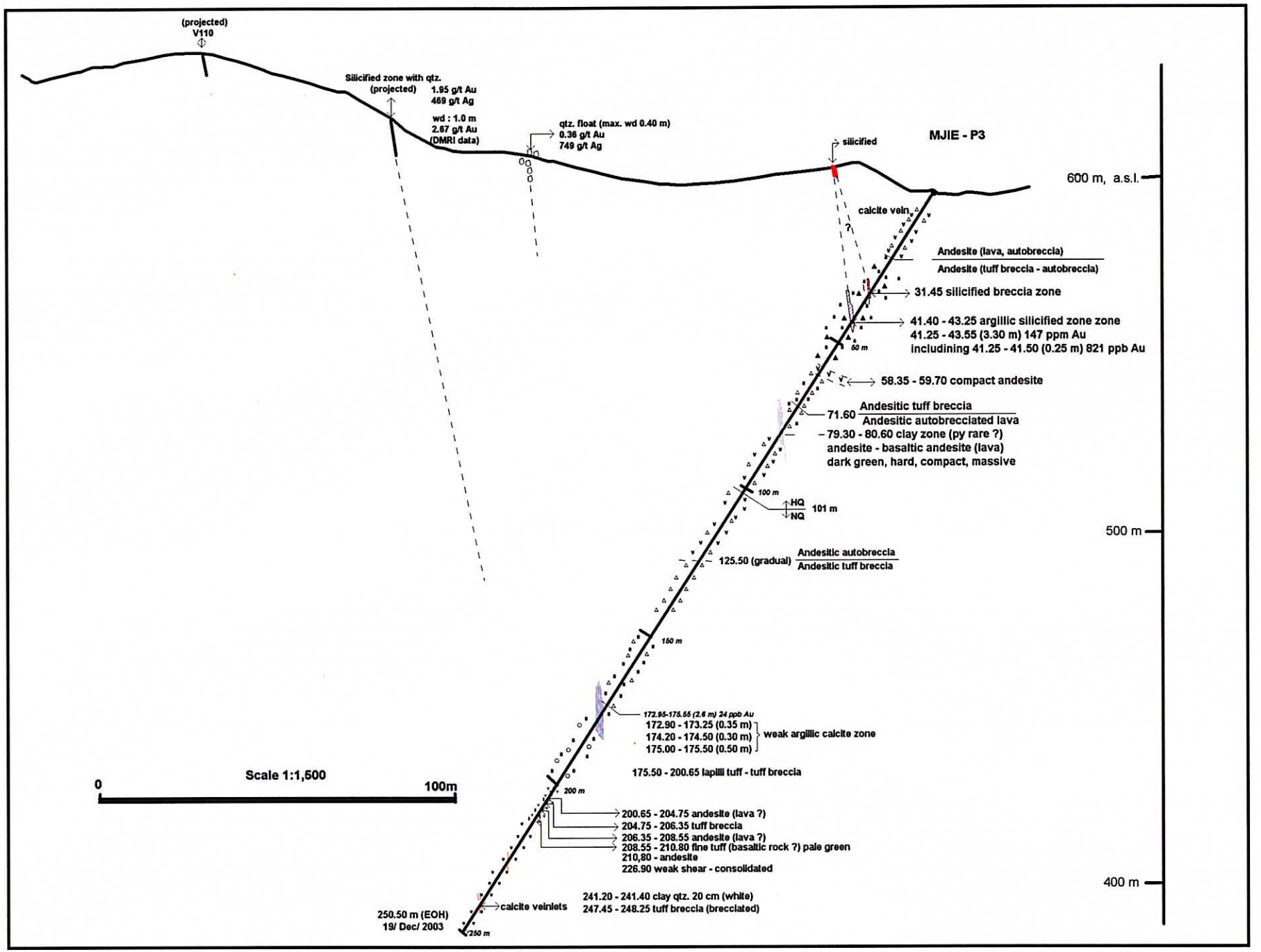


Fig. 4-10 Geologic Profile of Drill Hole M J I E - P3 in Prambon District

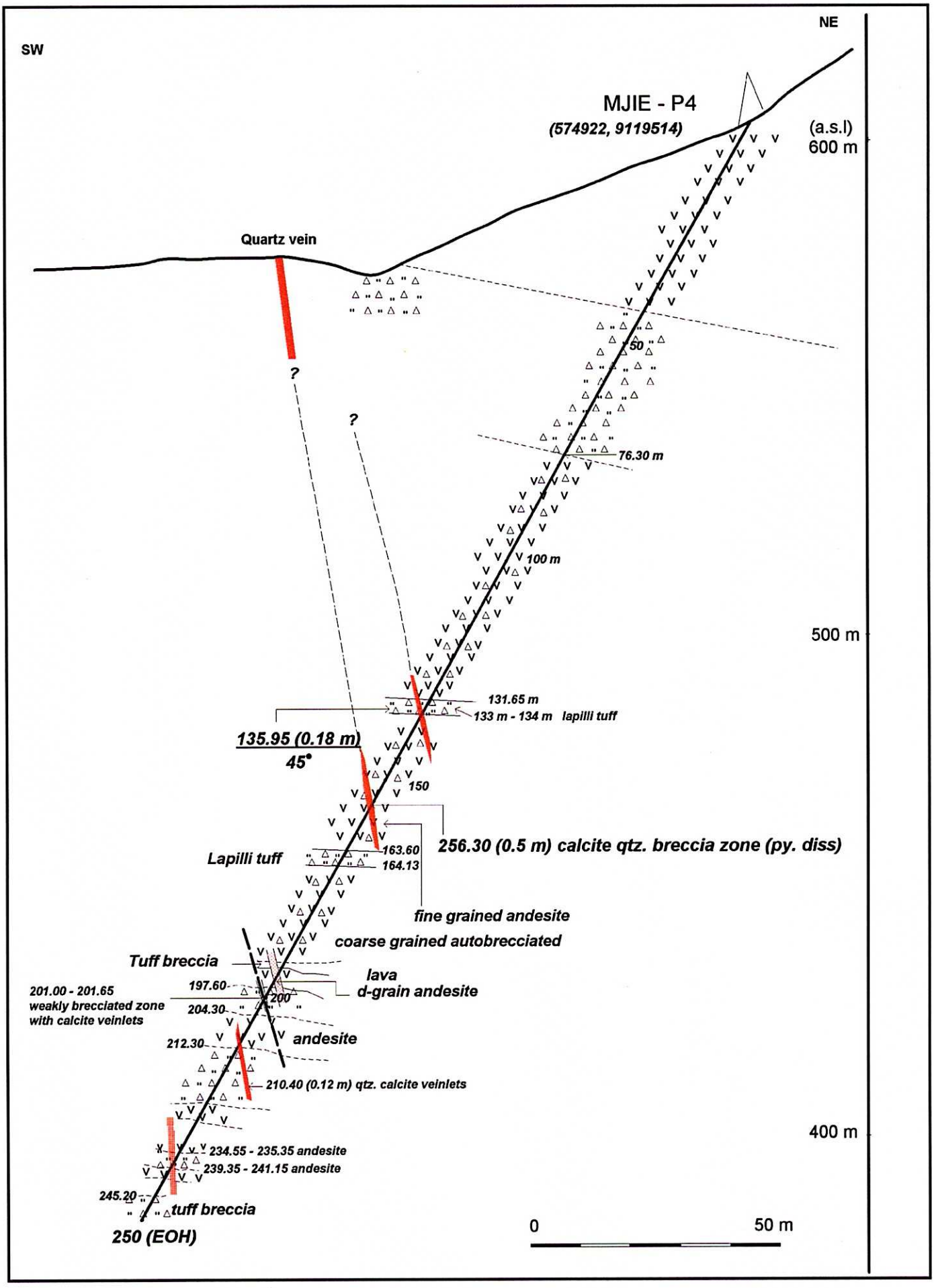


Fig. 4-11 Geologic Profiles of Drill Hole MJIE - P4 in Prambon District

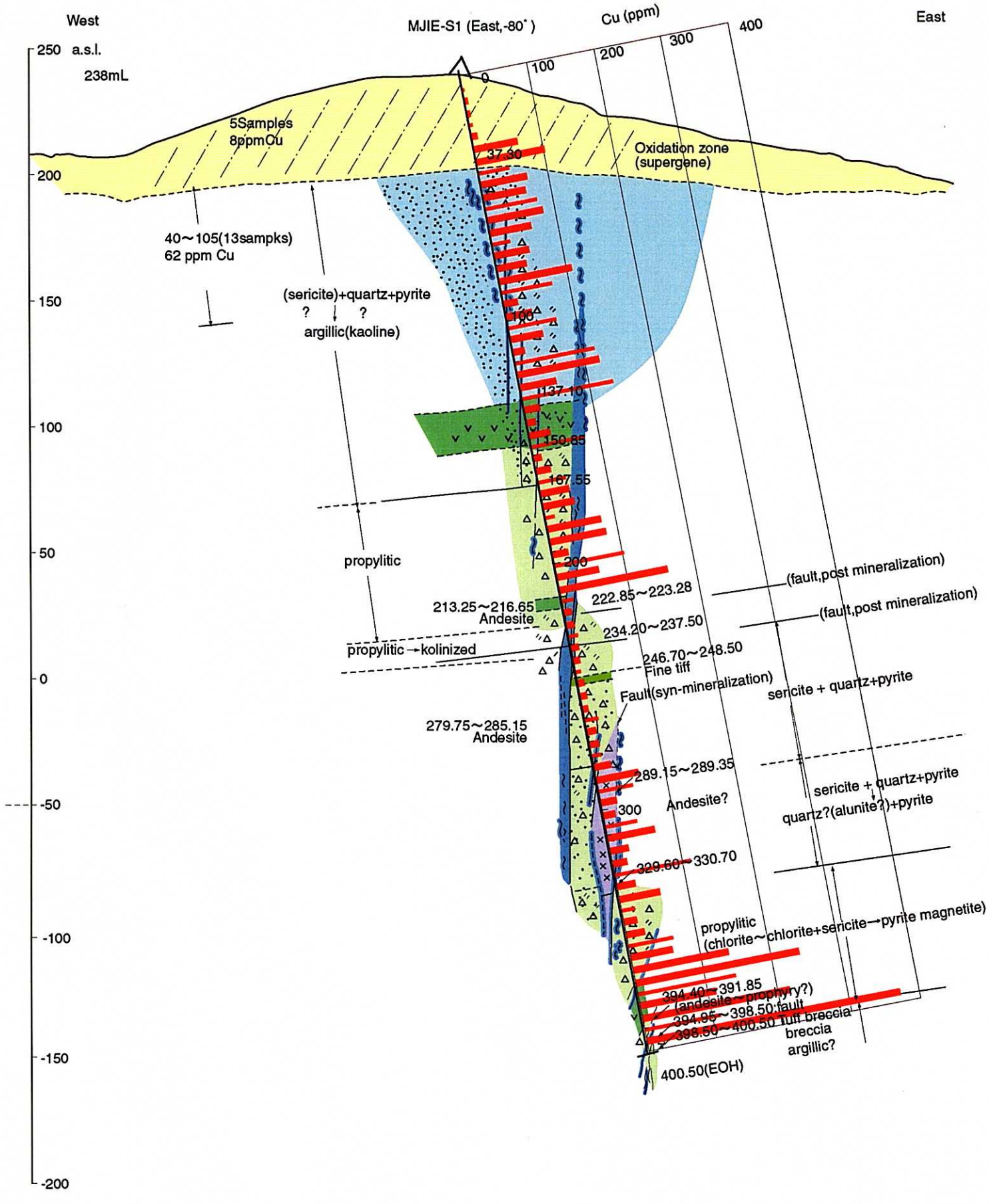


Fig.4-12 Geologic Profile of Drill Hole MJIE-S1

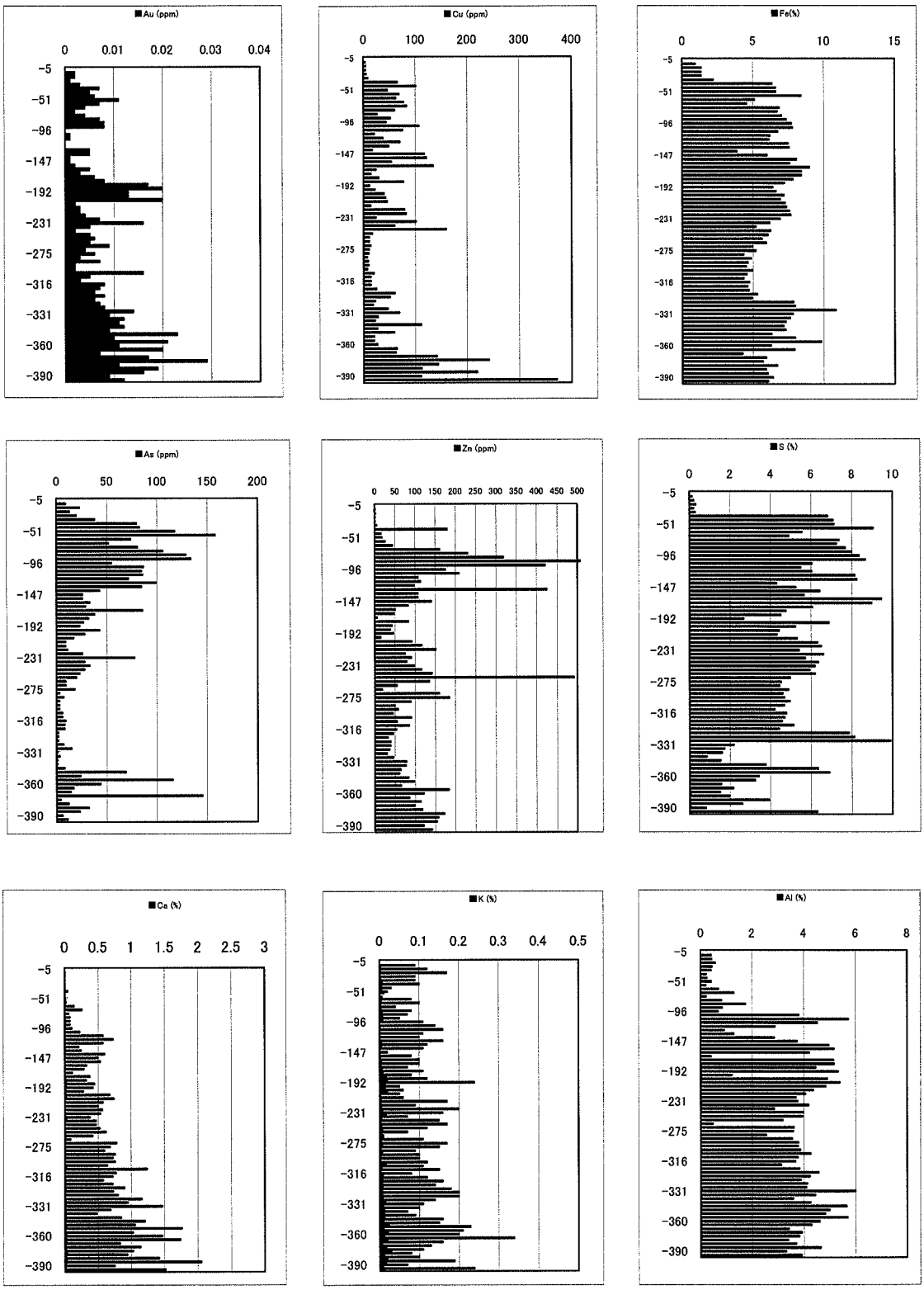


Fig.4-13 Chemical Analysis Results of Drill Hole Core Samples of MJIE-S1

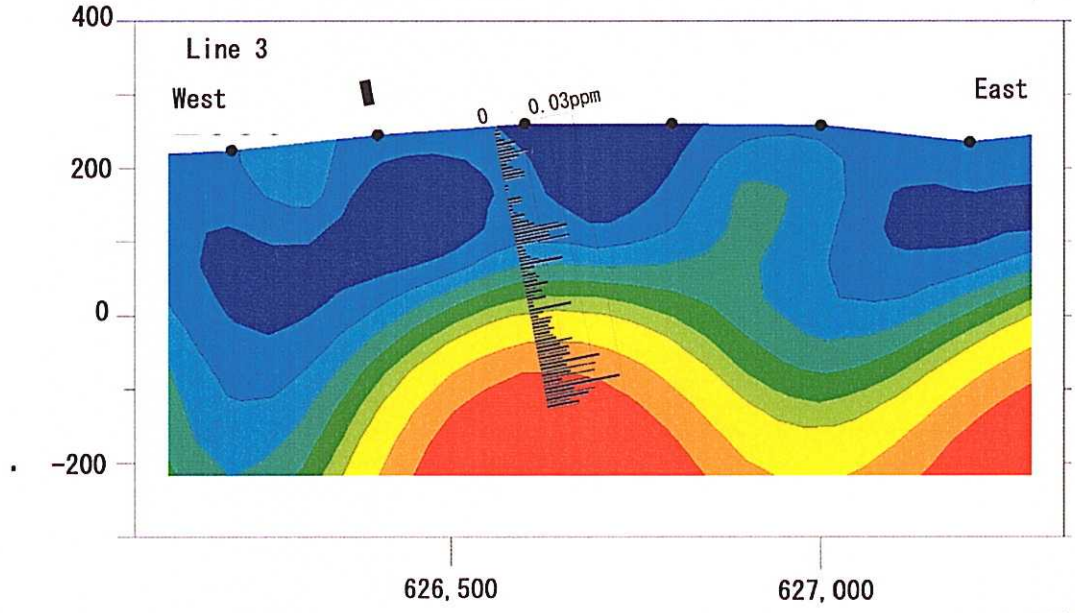


Fig. 4-14 Chargeability and Gold Values of Drill Core Samples from MJIE-S1

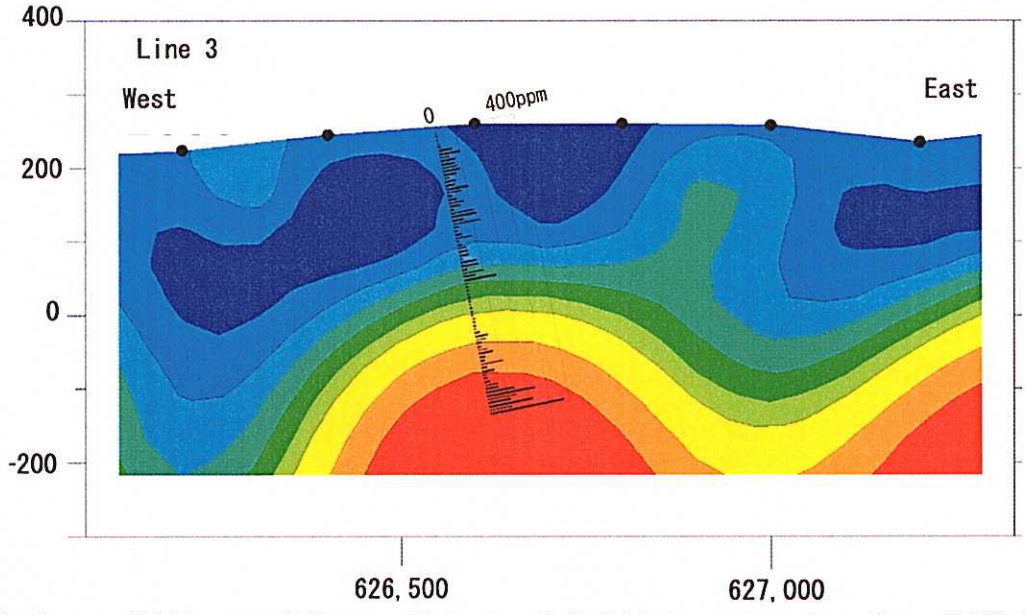


Fig. 4-15 Chargeability and Copper Values of Drill Core Samples from MJIE-S1

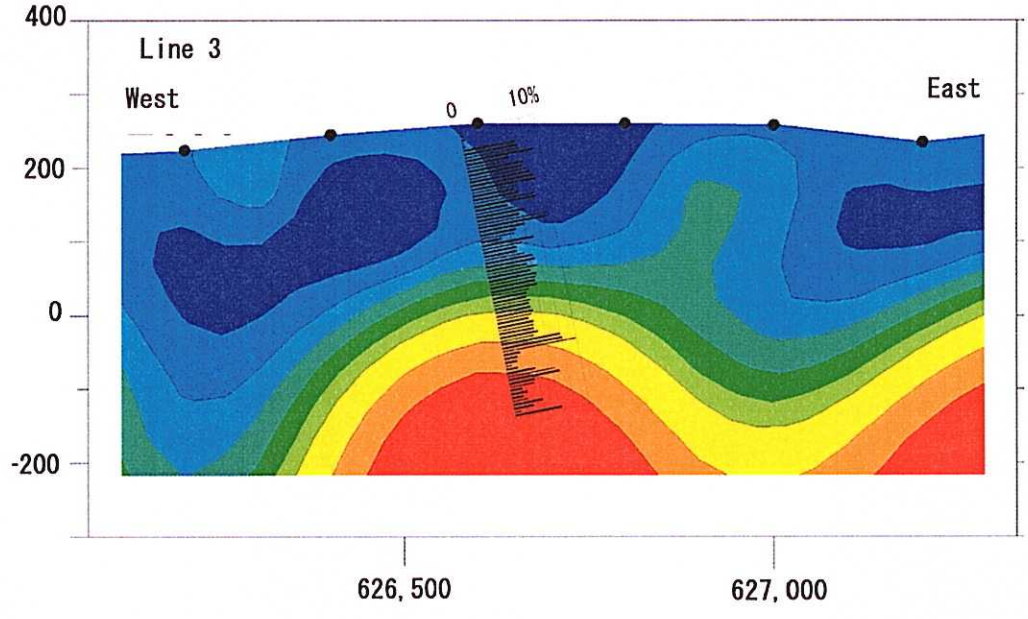


Fig. 4-16 Chargeability and Sulfur Values of Drill Core Samples from MJIE-S1

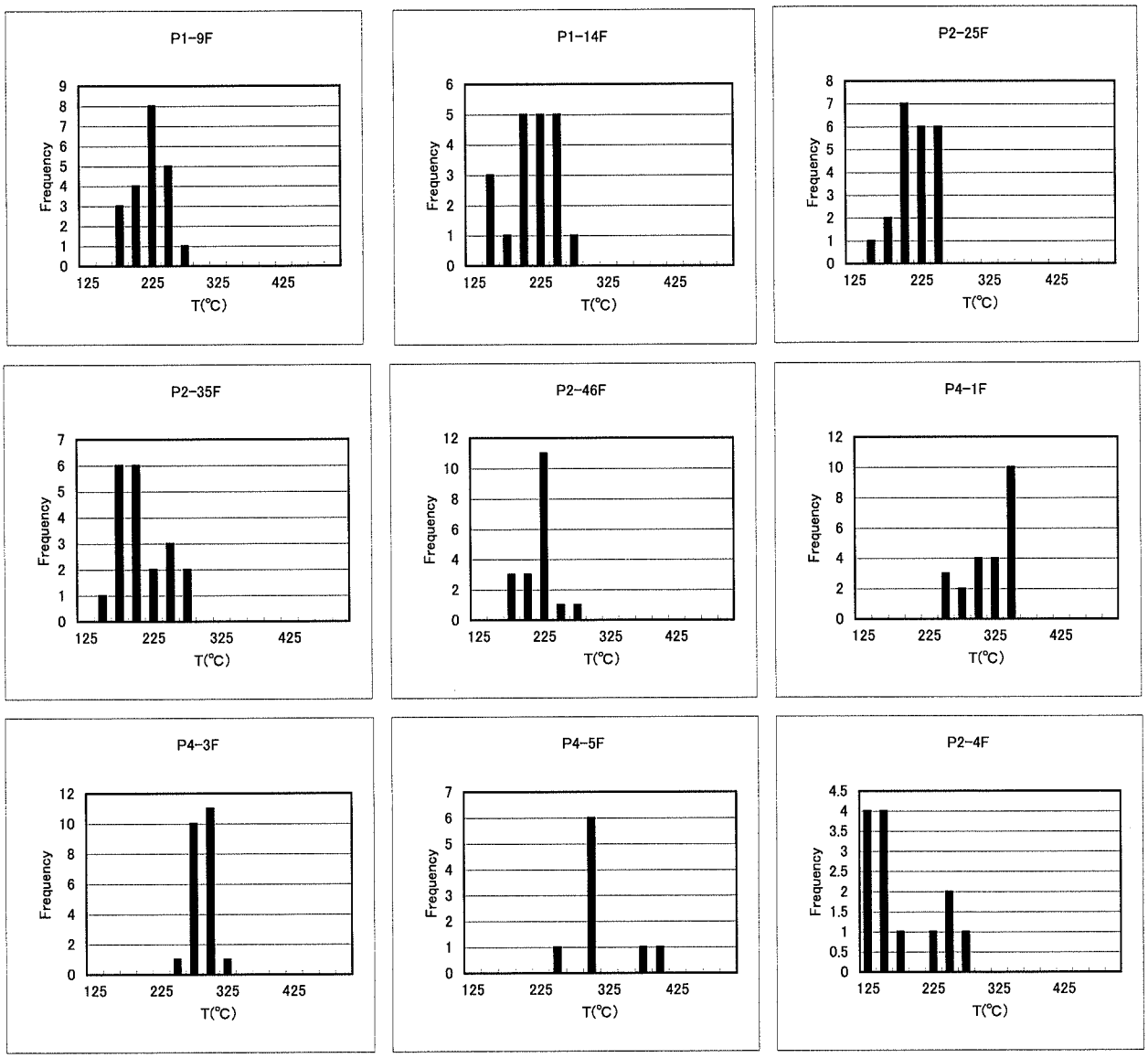


Fig. 4-17 Homogenization Temperature of Fluid Inclusion, Prambon District

Table 4-21 Geologic Log of Drill Hole MJIE-P1 (1)

Depth (m)	Geologic Column	Lithology	Alteration	Mineralization	RQD
5		soil			
		soil			
		7.85 dsrk green - gray porphyritic andesite			20
10					76
		dark green - gray porphyritic andesite			45
					35
					17
		14.30			20
15		14.80 ↘ 40°			44
		dark green - gray porphyritic andesite			100
					100
		17.55 ↘ 45°			70
		grayish green lapilli tuff			68
20		18.60	19.60-19.95 argillic	19.90 calcite 0.3 cm	60
		20.70 grayish green lapilli tuff fragment 0.5 - 1.0 cm	20.00-20.75 argillic weak	20.00-20.75 py weak	80
		22.00 dark gray andesite			40
					58
		23.70 fracture zone		23.25-23.70 qtz. vein 0.5 cm ↘ 10°	63
		24.00			50
25		25.70 gray - whitish gray argillic rock	25.70-27.05 argillic + silicified zone	25.70 py. rich	40
					20
		27.05 whitish gray tuff breccia fragments 3.0 - 5.0 cm	27.00-28.85 argillic weak	py	100
					100
		28.85		27.85 py. vein 0.2 cm	80
30				28.85	
		grayish green tuff breccia			100
					90
					100
					100
35		34.70	34.70 argillic		90
		grayish green tuff breccia			100
		36.85 argillic	36.85 argillic		100
					100
				39.45 calcite 0.5 cm	100
		39.75 argillic	39.80 argillic 5.0 cm	39.80 py. rich 39.50	100
40		40.50 ↘ 30° tuff breccia argillic weak	40.50-41.65 argillic weak 41.65-42.15 argillic strong 42.15-43.65 silicified	40.00 calcite qtz. vein 1.0 cm 40.50 qtz. vein 0.5 cm 41.65 - py. rich	100
		41.75 ↘ 30°		P1-1A, P1-2A, P1-3A, P1-4A, P1-5A, P1-5A, P1-6A PY	20
		42.15 brecciated silicified rock fragments with py.	43.65-44.55 argillic		100
		44.00 argillic rock, gray			50
45		44.55	P1-30X		100
		grayish light green tuff breccia			
		45.90 argillic strong silicified strong py. rich	46.00-46.70 argillic 46.70-47.30 silicified strong	45.90 qtz. vein 2.0 cm ↘ P1-7A, 7F 47.00-47.30 py. rich P1-8A	100
		46.90		P1-9A, 9F, 9P PY	80
		47.40		P1-10P	100
		48.00 gray - light green tuff breccia	argillic silicified weak	48.00 qtz. vein 48.20 py. clay ↘ 30°	100
50					100

Table 4-21 Geologic Log of Drill Hole MJIE-P1 (2)

Depth (m)	Geologic Column	Lithology	Alteration	Mineralization	RQD
		51.50-51.70 py vein	51.50 / 51.60 / 51.70 py. vein	51.50 / 51.60 / 51.70 py. vein P1-11A	90
		py stock work	52.0 qtz. vein 0.5 cm silicified	52.0 qtz. vein 0.5 cm P1-12A py	100
		52.75-53.05 gray-whitish gray tuff breccia	53.50 clay P1-13X	52.60 py stock work P1-13A, 13P	70
		54.30	54.70 clay	54.70 clay + py	80
55		54.70		54.90-55.50 py. rich	100
		55.50 flow texture fine tuff dark green andesite ?	55.40 clay		80
		57.65			100
		grayish green fine grain andesite			75
					54
60		brecciated			68
		61.60	61.60 clay 10 cm	61.60 clay + py	100
		grayish green fine grain andesite silicified weak	silicified weak	63.40-63.80 calcite veinlets	100
				64.00 py. rich	100
65					100
		65.20 andesite, silicified weak : py	65.20 silicified weak P1-31X 66.20	65.90 qtz. + calcite vein py.	100
		66.20			100
		67.50 grayish green andesite P1-38T		67.50 calcite py. vein 2.0 cm	100
		68.60		68.70 calcite 2.0 cm P1-14F, 14A	100
		68.90		68.80 py. vein + qtz. + calcite 1-2 cm	
		69.40		69.40-69.75 silicified + py.	100
70		69.95 green andesite ?			
		70.40	70.40	70.25 calcite vein 0.5 cm	100
		70.85 gray silicified rock	silicified strong	70.60 qtz. calcite P1-15F, 15A	
		71.35		71.00-71.30 calcite vein	100
		71.60		71.60 py. vein	
		72.10 grayish green andesite ?		72.10 py. vein 73.45 py. vein 73.50 py. vein	100
		silicified rock		74.00-74.60 py. veinlets	
		74.00	silicified strong	P1-16A	100
75					100
		75.05 dark green compact andesite ?		76.40-76.85 py. veinlets 0.5-1 cm	100
		76.30	77.00 clay 10 cm	77.10-77.30 py. vein	100
		whitish gray silicified rock	silicified strong	78.25 qtz. vein + py. 1.0 cm	100
		78.35 ↘10_			
		79.25 dark green compact andesite ?		79.40 py. vein 0.2 cm	100
		79.40			
80		whitish gray silicified rock	silicified strong		100
		80.95		py. rich	100
		grayish green andesite ? py spot	83.90 argilic ↘30_		100
		82.70 clay calcite ↘30_		P1-17A	
		83.70		P1-18A	100
		84.00 gray - whitish gray	silicified strong	P1-19A	
85		84.90		85.00 qtz. vein 0.2 cm P1-20A	100
		silicified rock		85.60 qtz. vein 0.5 cm	100
		85.60 whitish gray silicified py		86.00 qtz. vein 0.5 cm py rich	
		85.90 whitish gray silicified strong py vein rich	silicified strong	P1-21A	50
		87.00		P1-22A, 22P	
		88.00 silicified strong zone		py. vein rich	60
		88.40 silicified zone	88.40 argilic P1-23X	P1-23A	73
		88.80	88.90 argilic 10 cm P1-24X	P1-24A	
		89.40 gray qtz. silicified strong ↘30_	89.40 argilic 5 cm		55
90		90.20			100
		grayish green tuff breccia			100
					100
		94.00 clay			100
					100
95					100
		95.40 clay ↘20_	P1-32X		100
					100
		grayish green lapilli - tuff breccia			100
			silicified weak		100
100				99.70 qtz. calcite 0.5 cm	

Table 4-21 Geologic Log of Drill Hole MJIE-P1 (3)

Depth (m)	Geologic Column	Lithology	Alteration	Mineralization	RQD
		grayish green silicified fine tuff ?			100
					100
		102.50 whitish gray silicified rock	103..50 argillic - silicified strong	py. diss. weak	100
		102.95	104.40 argillic 2.0 cm	103.00 silicified qtz. 1.5 cm	43
		103.85 silicified medium	104.85 qtz. vein 0.5 cm ↘ 35_		100
105		whitish gray tuff breccia			100
					100
		silicified medium		P1 - 42A	100
		108.90 gray silicified rock	108.90 - 109.40 silicified strong	108.90 - 109.40 py. rich	100
		109.40	109.70 argillic 10 cm	P1 - 43A P1 - 44A	86
110		110.15 whitish gray-green yellow fragments tuff breccia		110.15 qtz. vein ↘ 20_	100
					100
		small fragments			100
					100
115					100
		115.70	115.70 argillic 2.0 cm		100
		116.60	116.60 argillic 1.0 cm P1 - 44X		100
		118.25	117.80 - 117.90 silicified py.	P1 - 45A	
			118.25 - 118.60 argillic	118.25 - 118.60 py.	58
		grayish green-light green andesitic tuff breccia		119.20 calcite vein	100
120				119.00 py. fragments	100
					100
		122.50	122.50 argillic weak		100
					100
125					100
		125.50 grayish tuff			100
		126.30			100
		grayish-light green lapilli tuff			100
					100
130					100
		130.50	130.50 argillic weak		100
		132.40	132.40 argillic P1 - 33X		100
		grayish green-light green lapilli tuff - tuff breccia			100
					100
135					100
		136.00 ↘ 30_	136.00 calcite vein 0.7 cm	136.00 calcite vein 0.7 cm	100
		137.90 fracture fine grain			100
					50
		138.80 ↘ 30_			100
140		dark green compact prophylitic andesite	prophylitic		100
					100
					100
		143.60 breccia P1 - 40T	143.60 qtz. calcite vein	143.60 qtz. calcite vein	100
			144.50 calcite vein	144.50 calcite vein	100
145					100
		dark green andesite			100
					100
					100
150					100

Table 4-21 Geologic Log of Drill Hole MJIE-1 (4)

Depth (m)	Geologic Column	Lithology	Alteration	Mineralization	RQD
		150.20 ↘ 20°	150.20 clay 1 - 2 cm		100
		151.65 light green lapilli tuff fragment < 2.0 cm	151.65 clay	151.65 py. diss.	100
					100
					100
					100
155					100
					100
					100
		158.30	158.30 calcite 0.2 cm	158.30 calcite 0.2 cm	100
		159.15-159.25 ↘ 40°		159.15 calcite 0.2 cm	100
160				159.25 calcite 0.3 cm	100
		light green compact andesite	prophylitic		100
					100
					100
					100
		164.50 whitish gray argillic tuff	164.50-164.60 argillic	P1 - 34X	85
165			164.75 argillic	P1 - 25X	py. rich
		165.25-165.35 whitish gray tuff breccia - lapilli tuff	165.25-165.35 argillic + silicified	P1 - 27X	P1 - 25A P1 - 26A P1 - 27A
					100
		grayish green tuff breccia			100
					100
					100
170		170.10-170.20 ↘ 45°		170.10 calcite vein 0.3 cm	
				170.20 calcite vein 0.3 cm	100
		grayish green tuff breccia			100
					100
					100
					100
175					100
		grayish green tuff breccia			100
		177.25 ↘ 40°		177.25 calcite 1 cm	
		178.35		178.35-178.45 py. rich fragment	100
		179.40-179.60	179.60 clay 0.2 cm	179.40 py. rich	100
180					100
		grayish green tuff breccia			100
		181.90	181.90 clay 0.2 cm		100
					100
					100
					100
185					100
		grayish - light green tuff breccia			100
					100
					100
					100
190					100
		grayish - light green tuff breccia	P1 - 35X		100
		192.50	192.50 clay 0.3 cm		100
		193.95		193.95 qtz. vein 0.5-1 cm	100
					100
195					100
		grayish - blueish green tuff breccia			100
					100
					100
		198.90			100
200					

Table 4-21 Geologic Log of Drill Hole MJIE-P1(5)

Depth (m)	Geologic Column	Lithology	Alteration	Mineralization	RQD
		201.00			100
		201.65 grayish green tuff breccia	201.00-201.65 argillic	201.00-201.70 silicified + py. P1-24A	100
					100
		203.50 203.70		203.50 qtz. vein 1 cm	100
		204.00		203.70 calcite vein 1 cm 204.00 calcite vein 0.5 cm	100
205					
					100
					100
		207.30 207.70		207.30 qtz.-calcite vein 0.5 cm	100
		207.90 grayish green fine tuff ?		207.70 calcite vein 0.3 cm 207.90 qtz. vein 2 cm	100
					100
210		209.90			
		210.25 dark green andesite		210.25 calcite vein 10 cm P1-29A	100
		211.50		211.50 qtz. -calcite vein 1.5 cm	100
		212.30		212.30 calcite vein 0.2 cm	
		212.40		212.40 calcite vein 0.2 cm	100
		213.70		213.70 calcite vein	100
					100
215					
		216.20 216.60 grayish green tuff breccia	216.20 clay	216.60 calcite vein	100
		216.90		216.90 calcite vein	100
					100
					100
					100
220			P1-36X		
		grayish-light green tuff breccia			100
					100
					100
		P1-41T			100
					100
225		225.20	225.50 clay 1 cm	225.20 calcite vein 1 cm	
		225.50		225.50 calcite vein 1 cm	100
					100
		grayish-light green tuff breccia (fragments 3-5 cm)			100
					100
					100
230		230.05		230.05 calcite vein 1 cm	
					100
					100
		grayish-light green tuff breccia - lapilli tuff (fraagments 2-3 cm)			100
					100
					100
235					
					100
		236.90			100
		237.20 green fine tuff ?			
		237.50		237.50 calcite vein 5 cm	100
					100
					100
240					
					100
		grayish-blueish green tuff breccis			100
					100
					100
					100
245		245.00 ↘ 20°		245.00 ↘ 20° calcite 1 cm	100
		245.80		245.80 ↘ 80° calcite 0.5 cm	100
		246.80		246.80 calcite 0.5 cm	100
		grayish green tuff breccia			100
					100
250		249.8	249.80-249.90 argillic P1-37X		100

Table 4-22 Geologic Log of Drill Hole MJIE - P2 (1)

DEPTH (m)	Geologic Column	LITHOLOGY	ALTERATION	MINERALIZATION	RQD
		Thin section : T	X-ray defrac. : X	Polished : P Analysis : A Inclusion : F	
		brown - brownish red soil			
		whitish gray soft andesite			
5					
10					
15					
		18.50 ↘ 50_ 45_ purplish green andesitic lava flow banded		limonitic vein lets	
20		↘ 20_		20.20 limonitic 0.1 cm	
		22.00 - 22.30 clay breccia zone			
		flow banded andesitic lava	23.45 - 24.80 weak argillic	22.50 limonitic vein lets 0.2 cm ↘ 15_	
		23.45 compact lava pale grayish green		22.55 limonitic vein lets 0.2 - 0.4 cm	
25			24.80 - 28.30 very weak silicified + argillic pyrite diss.	24.50 - 24.90 mangan oxide	
		25.20			
		greenish gray compact andesite		27.00 limonitic vein ↘ 0 - 10_	
			28.30 - 29.05 argillic medium - strong	27.80 ↘ 55_ limonitic vein 28.00 ↘ 15_	
30			29.05 - 30.95 argillic weak		
		30.95 30.95 - 32.60 breccia zone (breccia dyke)			
		32.60 ↘ 55_			
		gray massive compact andesite	weak argillic - silicified	pyrite diss. weak	
35					100
		35.70 - 36.00 auto breccia			
		36.50 brown tuff breccia		37.95 - 38.15 qtz. silicified breccia 18 cm ↘ 40_	68
		fragment : ■ max. 10 cm, gray - greenish gray matrix : brownish ash, lithic, rather hard, compact massive			88
		38.60		38.60 white qtz. vein 2.0 cm	92
			39.40 calcite vein	39.40 calcite vein	90
40					
		brown - greenish gray andesitic tuff breccia			100
					95
					100
				43.30 calcite 2.0 cm ↘ 45_	95
45					100
					100
					100
50					

Table 4-22 Geologic Log of Drill Hole MJIE-P2 (2)

DEPTH (m)	Geologic Column	LITHOLOGY	ALTERATION	MINERALIZATION	RQD
		greenish gray compact andesitic tuff breccia			95
					100
		56.6		52.60 calcite qtz. vein 1.0 cm	95
		53.2		53.20 calcite qtz. vein 2.0 cm	100
		54.2		54.20 clcite qtz. vein 1.0 cm	100
55		55.2 clay	55.20 argillic weak 6.0 cm	55.20 qtz. vein lets weak 1.0 cm	100
		greenish gray - brown andesitic tuff breccia			80
		58.3		58.3 qtz. vein 0.5 cm	100
		58.6		58.6 calcite vein 0.2 cm	100
60					100
		60.55		60.55 qtz. vein 0.5 cm ↘80_	95
		61.05 greenish gray - brown andesitic tuff breccia compact		61.05 qtz. vein 0.3 cm ↘50_	64
					90
		lapilli tuff			95
65					100
		65.15		65.15 qtz. vein 0.3 cm	100
		65.55		65.55 ↘50_ qtz. vein 0.2 cm ↘80_	100
		66.75 greenish gray tuff breccia		66.70 qtz. vein 0.2 cm ↘70_	95
					95
70					100
		70.6		70.6 calcite qtz.vein 0.5 cm ↘50_	100
		71,7		71.70 calcite qtz. vein 0.2 cm	100
		72.0 gray compact andesitic tuff 72.40 andesit dyke 7.0 cm			100
		73.24		73.24 calcite vein 0.5 cm	100
		73.54 lapilli		73.54 qtz. vein 3.0 cm	
		74.19		74.17 calcite vein 0.5 cm	100
75					100
		greenish gray - brown andesitic - tuff breccia			100
		76.75		76.75 ↘ qtz. vein pyrite 1.0 cm	100
		77.05		77.05 40 qtz. vein 0.2 cm	100
		greenish gray compact - tuff breccia			100
		78.65		78.65 qtz. vein 0.4 cm	100
		79.15		79.15 calcite qtz. vein 0.8 cm	96
80					
		80.45		80.05 qtz. vein 2.0 cm	100
				80.45 qtz. vein 0.5 cm	95
		82.45 - 82.65 clay zone with qtz. vein	82.65 cm arg. strong 82.65 m	82.45 - 82.65 qtz. vein with pyrite	100
		83.50 light greenish gray andesitic tuff breccia	P2-3X	83.50 qtz. vein P2-2A	95
		84.45			100
85					
		85.15	•84.50 m	85.15 qtz. vein 1.5 cm P2-1A	100
		greenish brown - gray tuff brecccia		85.25 qtz. vein 0.3 cm	100
		87.0-87.10		87.0 - 87.10 qtz. vein 1.0 cm	100
		87.8		87.80 qtz. vein 0.5 cm	
		88.2		88.30 qtz. vein 0.6 cm	100
		89.3 gray - light brown tuff breccia		89.30 qtz. vein 0.5 cm	95
90					
		90.65		90.55 qtz. vein 1.5 cm, 1.0 cm	100
		lapilli			80
		92.15		92.15 qtz. vein 1.5 cm	95
		92.45		92.45 qtz. vein 1.0 cm	
		93.6 breccia arg.	93.6 argillic	93.6 qtz. vein 1.0 cm P2-56A	100
		94.85-95 claay zone	94.85 - 95.0 argillic strong	94.80 qtz. vein 1.0 cm 94.85	90
95					
		95.26 - 95.66 qtz. vein	95.0 - 99.15 sili. strong	95.26-95.66 white qtz. vein 40 cm	33
		95.0 - 97.15 silicified zone	py rich	95.85 qtz. vein 2.0 cm	
		95.26 - 95.66 qtz. vein	sili. (97.75)	96.30 ↘60 qtz. vein 3.0 cm	62
		97.15		96.70-96.90 qtz. + sili.	
		97.80 clay zone py rich	97.15 - 97.80 arg. strong	97.05-97.15 qtz. vein 10 cm	60
			97.8 - 99.0 sili. weak	96.90	
		98.55 whitish gray tuff breccia	P2-8X, 9X	P2-3A-8A P2-57A P2-3P, 6P	72
100				99.30 qtz. vein 1.0 cm P2-4F	64

Table 4-22 Geologic Log of Drill Hole MJIE-P2 (3)

DEPTH (m)	GEOLOGIC Column	LITHOLOGY	ALTERATION	MINERALIZATION	RQD
		greenish grey tuff breccia			100
					100
		102.40 lapilli			100
		103.20 clay	103.20 argillic 10 cm		80
		103.70 clay + qtz.	103.70 argillic	103.70 qtz.	90
105					
		105.80 clay	105.80 argillic 10 cm		100
		106.70 greenish gray lapilli tuff		106.70 pinkish calcite 0.5 cm	100
		107.50		107.5 calcite vein 0.3 cm	100
			Propilitic		100
		109.15		109.15 qtz. vein 0.3 cm	100
110		110.0		110.00 qtz. vein .0.5 - 1.0 cm	
		110.6		110.60 calcite vein 0.5 cm	100
		110.8		110.80 calcite vein 0.5 cm	100
		111.0		111.00 calcite vein 0.5 cm	
		111.15		111.15 pinkish calcite 1.0 cm	
		112.2		112.20 pinkish calcite 1.0 cm	100
		112.3 lapilli tuff		112.30 calcite 0.5 cm	
					100
		114.0 greenish gray tuff breccia	Propilitic		100
115					
		115.65			100
					100
		116.65 greenish gray lapilli tuff		116.65 calcite qtz. vein 1.0 cm	
		117.75			100
				117.75 calcite qtz. vein 0.5 cm	
		118.50			100
			Propilitic	118.5 qtz. vein 0.5 cm	40
120				119.25 calcite vein 0.5 cm	
		120.25 - 120.35 clay	120.20 - 120.60 argillic strong	120.60 calcite qtz. vein	70
				120.25 - 120.35 pyrite weak	
					70
		122.40 clay 10 cm			90
					20
					75
125					
		green - light green lapilli tuff - tuff breccia			90
					35
					15
				128.15 qtz. vein 1.5 cm	
					20
					25
130					
		130.5		130.50 qtz. vein 1.0 cm	
		130.7	130.70 - 131.45 argillic - silicified strong	131.13 - 131.43 arg. + sili + qtz. vein green ep. ?	76
		131.45	131.70 argillic 5.0 cm	131.17 qtz. vein 5.0 cm	
		131.70		131.32 qtz. vein 3.0 cm	45
		green - dark green lapilli - tuff breccia			74
					100
135					100
					100
		dark green lapilli - tuff breccia	propilitic	135.86 qtz. vein 0.5 cm	
					100
					100
		138.5		138.50 qtz. vein 0.4 cm ↘45	100
140					
					75
		141.50		141.75 qtz. vein 3.0 cm pyrite (fine)	
		141.75 greenish gray andesite			100
			propilitic weak		75
					100
		144.08 greenish gray andesitic tuff breccia		144.08 qtz. vein 0.2 cm	100
145					
		145.55		145.55 qtz. vein 1.5 cm (white)	100
		145.65		145.65 qtz. vein 1.0 cm	
		146.00		146.00 qtz. vein 0.5 cm	
			propilitic weak		100
		dark green andesitic tuff breccia			100
					100
150					100

Table 4-22 Geologic Log of Drill Hole MJIE-P2 (4)

DEPTH (m)	GEOLOGIC COLUMN	LITHOLOGY	ALTERATION	MINERALIZATION	RQD
		150.8 dark green tuff breccia	prophylitic	150.8 qtz. vein 0.5 cm	100
		152.12 light green fine grain andesite		152.12 qtz. vein 0.3 cm	100
		152.38 50		152.32 qtz. vein 0.2 m	95
		153.24	152.31 silicified	153.52 qtz. vein 2.0 cm	
			152.24	153.6 10 qtz. vein 1.0 cm	100
155				154.85 50 qtz. vein 0.4 cm	80
		P2-34 T			100
		156.8	P2-33X		100
		157.4 light green tuff breccia		156.8 50 qtz. vein 2.0 cm	90
				157.4 qtz. vein 0.5 cm	80
		159.66	Prophylitic	159.66 qtz. vein 6.0 cm (white) P2-11A	100
160		160.09		160.09 qtz. vein 0.5 cm	100
		161.50		161.50 qtz. vein 4.0 cm (gray) P2-12A	100
		162.27 light green - gray fine grain andesite	162.20 silicified	162.20 qtz. vein	100
		163.90		162.55 qtz. vein 0.3 cm	
		164.55		162.70 75 qtz. vein 2.0 cm	100
		164.85	164.85 argillic strong + silicified	163.90 qtz. vein 0.5 cm P2-13A	95
165		light green - gray fine tuff ? andesite ?	166.10 argillic	165.10 - 165.20 qtz. vein 10.0 cm 165.3 qtz. vein	68
		166.7		165.68 qtz. vein 1.0 cm	
		167.3		166.10 qtz. vein 2.0 cm	95
		167.9 silicified rock	167.9 - 168.7 Silicified strong	166.70 qtz. vein 5.0 cm	
		168.7 clay P2-50 T	168.7 - 169.0 argillic strong	167.30 qtz. vein stock 7.0 cm	100
		169.0		168.13-168.27 qtz. vein 14.0 cm P2-14A P2-14X	100
170				169.40 qtz. vein 8.0 cm P2-58A	
				P2-15A	100
				P2-16A	
		171.45 breccia			100
					100
		172.0		173.0 - 174.0 qtz. + argillic	
		173.0 clay zone	172.60 - argillic 10 cm		100
		174.0	177.0 - 174.0 argillic strong		100
		174.45		174.90 qtz. vein 1.0 cm	
		174.80	174.45 - 174.8 argillic		100
175					100
		176.0	176.3 - 177,0 Silicified argillic strong	176.0 qtz. vein 0.5 cm P2-17A P2-17X	
		177.0 silicified rock argillic rock	177.0 - 178.35	P2-18A	100
		178.35 silicified rock	178.35 silicified strong	178.35 - pyrite rich	100
		178.75	178.75 argillic - silicified	P2-19A	95
		silicified rock			50
180		whitish gray	silicified strong	P2-20A	
		181.35		181.35 - 181.80 qtz. Py	40
		181.80	181.35	182.0 pyrite rich P2-21A	20
		182.10 qtz. + silicified + argillic zone	Silicified - qzt. - argillic zone	182.10 - 182.55 qtz. vein P2-22A	
		182.55		183.10 - 183.55 qtz. vein P2 - 23A	50
		183.10 (white qtz. whitish gray silicified)		184.20 - 184.44 qtz. vein to P2-25P	35
		183.55 gray argillic zone		184.75 - 184.80 qtz. vein P2-27A P2-25F	
		184.20		184.80	40
		184.44			
		184.75			
185		silicified + qtz. + argillic	P2-32 X	186.35 qtz. + silicified + argillic Py	20
		186.15 silicified + argillic	Silicified + qtz. - argillic		
		188.90			
		dark green andesite	188.70		
190		190.0 light green - gray lapilli tuff			
		191.70 clay calcite			
		light green fine tuff			
195		195.0			
		195.25 dark green prophylitic andesite P2-52 T			
		198.35		198.15	
		qtz. vein silicified strong zone	192.20 - 192.45 argillic strong	198.35 qtz. vein + silicified pyrite Py	
		192.20	192.45 - 192.75 silicified strong	192.20	
200		192.45 - 192.75 Clay qtz. vein			

Table 4-22 Geologic Log of Drill Hole MJIE-P2 (5)

DEPTH (m)	Geologic Column	LITHOLOGY	ALTERATION	MINERALIZATION	RQD
		dark gray silicified rock	200.60 qtz. silicified strong	200.60 qtz. silicified strong P2-37A	50
		200.60 dark gray argillic rock	201.25 silicified + argillic zone	201.25 qtz. vein 10 cm P2-38A P2-39A P2-40A P2-41A	70
		201.25 gray silicified breccia			70
			silicified + argillic medium	203.45 white qtz. vein 5.0 cm	100
		203.45		203.95 qtz. vein 2.0 cm 40 py P2-42A	
		203.71 white gray silicified breccia	Prophylitic		100
205					
		205.20		205.20 qyz. vein 1.0 cm P2-61A	100
		206.30 greenish gray andesite	silicified weak	206.30 qtz. vein 3.0 cm 50	100
		207.65		207.65 qtz. vein + silicified	20
		208.05		208.05 P2-43A	
		208.43		208.43 - 208.49 qtz. vein	100
		208.70		208.70 qtz. vein 1.0 cm	
		209.65 green andesitic tuff breccia	Prophylitic	209.65 qtz. vein 1.0 cm	100
210					
		211.25		211.00 qtz. calcite vein 1.0 cm 210.75	100
			213.80 - 215.50 argillic weak	211.45 - 211.57 qtz. vein py. py	100
		212.50 breccia zone 5.0 cm		212.50	
		compact andesite greenish gray			95
		213.80	P2-53X		100
			Prophylitic		60
215					
		whitish green tuff breccia			60
					100
		217.30			100
		black andesitic green flow bound fine tuff			100
			Prophylitic		100
220					
					100
					100
		222.15	222.15 - 222.65 silicified strong	222.15 - 222.55 qtz. + silicified zone	100
		222.55 qtz. silicified zone breccia			
		222.30	Prophylitic	224.10 qtz. vein 0.5 cm	100
		224.10			100
225					
		dark green - green compact andesite			100
					100
		217.50			100
		tuff breccia		228.0 qtz. vein 0.2 cm	
				229.17 qtz. vein 1.0 cm	100
			Prophylitic		100
230					
		greenish gray compact andesite		232.71 - 232.93 qtz. calcite 2.0 cm	100
					100
					100
		dark green andesite			100
			Prophylitic		100
235					
		P2-51T	P2-52X		100
		dark green andesite			100
					100
		auto brecciated andesite			100
					100
240					
		240.45	P2-54x		100
		greenish - dark green andesitic tuff breccia			100
					100
		243.0			100
			244.20 - 244.45 argillic strong		
		244.20	244.45 - 245.20 silicified weak		75
245		244.45 silicified tuff breccia			
		245.20 - 245.40 silicified tuff breccia	245.20 - 245.40 argillic P2-44X	245.70 P2-62a P2-44A	60
		245.70	245.40 - 245.70 silicified weak	P2-45 A	
		clay zone with silicified rock	245.70 - 246.90 argillic silicified arg.	py P2-46f P2-46 A	0
		246.90	246.90 -		70
		247.50 dark gray silicified zone with pyrite	silicified strong	247.50 qtz. py	
		248.40	250.00 sili	248.40 qtz.	80
		249.30	249.40 - 249.60 argillic	248.60 qtz. P2-48A	
250		249.40		249.80 qtz.	

Table 4-22 Geologic Log of Drill Hole MJIE-P2 (6)

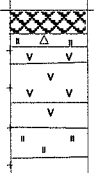
DEPTH (m)	Geologic Column	LITHOLOGY	ALTERATION	MINERALIZATION	RQD
		250.50 silicified rock 250.80 tuff breccia light green andesite 252.40 253.00 light green - gray andesitic tuff 253.80	250.50 silicified strong P2 -49 X 250.50 - 250.60 argillic P2 -55X Prophylitic	250.50 silicified qtz. pyrite P2-19 AP P2-63 A py 251.40 calcite vein 0.5 cm 252.40 calcite vein 0.5 cm	
255					
260					

Table 4-23 Geologic Log of Drill Hole MJIE - P3 (1)

DEPTH (m)	Geologic Column	LITHOLOGY	ALTERATION	MINERALIZATION	RQD
		soil			
		4.70			
5					
		7.00			
		greenish gray andesitic tuff breccia			74
			P3-5X		38
10					100
			10.40 - 12.20 argillic weak		80
		breccia			82
		auto breccia 3.0 - 3.5 cm			83
		12.80			87
				14..10 calcite vein 0.5 cm	
15					88
			argillic weak	15.60 calcite vein 0.1 cm	88
				16.40 calcite vein 0.1 cm	89
		greenish gray andesitic tuff breccia			89
			argillic weak		91
				18.80 calcite vein 0.3 cm	
20					88
					92
		grrenish gray andesitic tuff breccia			90
				22.20 calcite 0.3 cm	88
		23.20 - 24.20 gray massive compact auto breccia	P3-8X		80
		24.20 - 24.50 andesitic brownish tuff breccia			100
25					
		massive andesite			100
					100
		26.50 - 26.70 flow banded andesite			
		26.70			100
		28.00	28.00 thin clay		
		greenish gray - brown andesitic tuff breccia			100
		29.90		29.90 calcite 0.2 cm	100
30					
				30.50 calcite 0.3 cm	100
		31.30 clay	31.30 - 31.70 argillic strong P3-9X		60
		31.70			
		greenish gray - brown andesitic tuff breccia		33.32 calcite qtz. 0.5 cm	77
				33.55 calcite qtz. stock	
		33.60 clay	33.00 clay breccia	34.10 calcite 0.3 cm	77
			33.60 argillic 1.0 cm	34.30 qtz. calcite 0.5 cm	72
		34.70 - 34.90 clay zone ↘45_	34.70 - 34.90 argillic strong	34.70 - 34.90 qtz. vein > 1.0 cm	
35					
		35.40 - 35.60 clay zone		35.40 calcite 0.5 cm	40
				36.05 calcite 0.5 cm	
		whitish gray andesitic tuff breccia		36.20 calcite 0.2 cm	83
				36.30 calcite qtz. 0.3 cm	
				36.70 calcite 0.5 cm	87
				37.10 calcite qtz. 0.5 cm	
				37.50 calcite qtz. 0.3 cm	85
				37.90 calcite 0.3 cm	
		lapilli		38.00 calcite 0.5 cm	
40				39.10 calcite qtz. 2.0 cm	57
				P3-10A	100
		41.40		P3-1A	100
		clay breccia zone	41.40 - 42.60 argillic strong	P3-2A P3-3A	
		42.60	P3 -3X		58
		43.32 - 43.55 clay zone		43.25 qtz. vein lets 4.0 cm	
		whitish gray andesitic tuff breccia P3-6T P3-7T	43.32 - 43.55 argillic strong ↘45_ P3-6X P3-7X	P3-4A P3-4F P3-4P	58
45				P3-11A	100
		dark grey - green compact tuff			100
		46.00			
		compact andesitic tuff breccia		49.60 qtz. vein 1.5 cm ↓90_	95
		46.90			83
		dark green massive andesitic tuff breccia			100
		49.1		49.10 qtz. vein 0.2 cm	95
50					

Table 4-23 Geologic Log of Drill Hole MJIE-P3 (2)

DEPTH (m)	Geologic Column	LITHOLOGY	ALTERATION	MINERALIZATION	RQD
		dark green tuff breccia massive			100
					90
					100
					100
		54.50	prophylitic weak	54.50 calcite vein 0.3 cm	100
55		greenish gray andesitic tuff breccia		56.00 calcite qtz. 0.5 cm	100
				52.50 calcite vein 0.5 cm	100
				58.7 calcite 0.7 cm	100
		58.35 greenish gray compact andesite			100
		59.70	prophylitic weak	59.70 calcite 0.5 cm	100
60		61.00 greenish gray andesitic tuff breccia			90
					100
				63.25 - 63.65 calcite vein 0.5 cm	90
		63,65		↓ 90_	70
			prophylitic weak		90
65		66.50 compact andesite			100
					70
		67.80			80
		dark green andesitic tuff breccia	prophylitic weak	69.60 calcite 0.2 cm	95
70		dark green - gray andesitic tuff breccia	prophylitic		100
					100
					100
					100
75		dark green andesitic tuff breccia ?			90
					100
					100
			prophylitic		100
					100
		79.55 clay zone	79.55 - 80.60 argillic strong	py weak	44
80		80.60		80.80 calcite 0.2 - 0.5 cm	60
		green - dark green andesitic tuff breccia ?			100
		82.70		82.7 qtz. vein 10 cm	100
				82.80 pyrite weak	100
			Prophylitic		100
85					100
		86.70			100
		green - dark green andesitic lava breccia ?		86.70 qtz. vein 0.5 cm	100
				86.80 qtz. vein 0.5 cm	100
			Prophylitic		100
90		91.85	91.85 clay	91.85 clay with qtz.	100
		dark green andesitic breccia			100
					100
					100
			Prophylitic		100
95		dark green andesitic tuff breccia			100
					100
					80
					80
100					80

Table 4-23 Geologic Log of Drill Hole MJIE-P3 (3)

DEPTH (m)	Geologic Column	LITHOLOGY	ALTERATION	MINERALIZATION	RQD
		HQ ⇕ NQ dark green lapilli tuff	P3-12X prophylitic	*104.15 calcite vein 0.3 cm*	100 100 80 100 80
105		dark green lapilli tuff breccia	prophylitic		70 100 100 100 80
110		*109.55* greenish gray andesite *112.50* greenish gray - brown tuff breccia	prophylitic		70 100 100 100 100
115		tuff breccia	prophylitic		100 100 100 100 100
120		*121.50* greenish gray - green andesitic tuff breccia *fragments brown - light green color 0.3 - 5.0 cm*	prophylitic		100 100 100 100 100
125			prophylitic		100 100 100 100 100
130		*133.10* *green - light green massive andesite* P3-19T	prophylitic		100 100 100 100 100
135		*compact andesite (chlorite spot)*	prophylitic		100 100 100 100 100
140		*greenish gray compact andesite*	prophylitic		100 100 100 100 100
145		*greenish gray compact andesite*	prophylitic	*146.70 silicified* *147.20 calcite*	100 100 100 60 100
150					

Table 4-23 Geologic Log of Drill Hole MJIE-P3 (4)

DEPTH (m)	Geologic Column	LITHOLOGY	ALTERATION	MINERALIZATION	RQD
		150.50 andesite	P3-13X		100
		green lapilli-tuff breccia (fragments brown-dark green) ϕ 2-3 cm	prophylitic		100 100 100 100 100
155					
		green massive lapilli-tuff breccia	prophylitic		100 100 100 100 100
160					
		green massive lapilli tuff breccia	prophylitic		100 100 100 100 100
165					
		167.00 167.60 breccia zone 168.50 green fine tuff	prophylitic		100 100 100 100 100
170					
		green tuff breccia	P3-16X		100 100
		172.85 173.25 argillic weak	172.85-173.25 argillic weak	172.85-173.25 py	P3-16A P3-20A P3-17A P3-21A 50
		174.03 green clay zone	174.03-175.55 P3-17X	174.03-175.55 py	40 40
175					
		175.55 fine tuff	argillic calcite		P3-18A 20
		green tuff breccia	prophylitic	198.80 calcite	100 100 100
180		179.90			
		180.80 green tuff breccia	180.80 argillic weak 182.90		90 90
		182.50 182.90 argillic breccia	prophylitic		90 100 100
185					
		breccia green massive tuff breccia	prophylitic		100 70 100 100 100
190					
		green massive tuff breccia	prophylitic		90 100 100 100 100
195					
		breccia green andesitic tuff breccia	prophylitic P3-14X	thin calcite vein	80 100 100 100 100
200					

Table 4-23 Geologic Log of Drill Hole MJIE-P3 (5)

DEPTH (m)	Geologic Column	LITHOLOGY	ALTERATION	MINERALIZATION	RQD
		green tuff breccia			100
		200.70			100
		dark green compact andesite			100
					100
			prophylitic		100
205		204.70			
		↘ 45_ light green tuff breccia P3-22T			100
		206.35			100
		dark green andesite			100
					100
		fracture	prophylitic		70
210					
		green = grayish andesite			15
					65
					100
					100
					100
215					
		dark green andesite massive			100
					100
					100
					100
					100
220					
		dark green andesite			100
					100
					100
					100
					100
225					
		226.30 ↘ 60_ green fine grain andesite		226.30 calcite vein 0.5 cm	100
		227.00			100
					100
				229.00 calcite vein 0.3 cm ↘ 50_	100
		229.00 229.25-229.40		229.25 calcite vein 0.5 - 2.0 cm ↘ 30_	
		229.55 dark green compact andesite		229.55 calcite vein 0.5 cm ↘ 70_	100
230		230.30			
		grayish - dark green andesite			100
					100
					100
					100
			235.50 argillic 0.5 cm		100
235					
		235.90 dark green andesite			100
		236.75			100
					100
		grayish green andesite			100
					100
240					
					100
		241.20 qtz. vein + silicified 10 - 15 cm	241.30 - 243.63 argillic zone	241.20 white qtz. vein 5 - 8 cm py	
		241.63 clay		P3-23A	45
		242.50 core broken			55
		242.85	242.50 - 242.85 argillic weak		60
			244.50 argillic		50
		244.50			
245					
		245.05 fracture zone	245.30 - 246.35 argillic weak	245.65 qtz. vein 0.5 cm py	25
		246.35 dark green andesite		246.85 qtz. vein 0.5 cm	60
		246.05 grayish green andesite			68
		248.00 dark green tuff breccia		244.89 calcite vein	
		grayish green andesite	P3-15X	243.65 - 244.65 calcite vein 0.3 cm	90
250		249.50 dark green tuff brecciaa			100

Table 4-24 Geologic Log of Drill Hole MJIE - P4 (1)

Depth (m)	Geologic Column	Lithology	Alteration	Mineralization	RQD
		brown soil			
		yellowish brown soil			
		4.70			
5		brown weathered andesite			
10		brown weathered andesite			
15		15.80			
		silicified zone brecciated	15.80 - 16.80 m silicified strong	15.80 - 16.80 m qtz. stock work py diss.	30
		16.80 brown andesite			50
		17.35 grayish - blackish green compact andesite		limonite	90
		18.60			20
20		20.60			30
		weathered andesite			0
					0
				limonite	20
		blueish gray - green porphyritic andesite ?			40
25					90
					50
					40
					90
					100
30		green porphyritic andesite ?			100
		32.00			30
		green - dark green andesite		33.10 calcite vein 0.8 cm	100
		33.10		33.70 calcite vein 0.5 cm	
		33.70 fine grain andesite		34.20 qtz. vein	100
		34.20	silicified weak		100
35		35.50			40
		fracture zone			55
		36.70	silicified medium - strong		39
		gray - whitish gray silicified rock (andesite)			53
		39.35 silicified rock	39.35 - 39.90 m silicified strong	39.35 - 39.90 py rich	24
40		38.90 silicified medium			23
		40.40 gray - whitish gray andesite	silicified + argillic		18
		42.05 gray - whitish gray andesite	42.45 - 42.80 argillic weak		18
		42.80			65
		43.60 gray - light green andesite	P4 - 7X		65
45		45.25			100
		green - dark green tuff breccia			50
					100
					100
50					100

Table 2-24 Geologic Log of MJIE-P4 (2)

Depth (m)	Geologic Column	Lithology	Alteration	Mineralization	RQD
55		grayish green tuff breccia fragment 3 - 5 cm			100 100 100 100 100
		56.20 56.70 ↘40 clay green tuff breccia	56.20 - 56.40 argillic weak 56.70 argillic		100 88 100 100 100
60		green tuff breccia (fragments brown-dark green)			100 100 100 100 100
65		green tuff breccia			100 100 100 100 100
70		green - grayish green tuff breccia	P4 -8X		100 100
		73.00 grayish green - green andesite		73.00 qtz. vein 1.0 cm	100 100 100
75		76.10 76.40 ↘20 clay blueish green fine grain andesite auto breccia 78.60 silicified zone 79.05 79.90 blueish green fine silicified rock	76.40 clay silicified weak - medium	76.10 qtz. silicified vein 1.5 cm py. diss. P4 -6A 78.60 - 78.90 qtz. silicified py. rich 79.05 silicified + py vein 2.0 cm	100 100 100 100 100
80		80.70 blueish green breccia andesite 82.00 - 82.40 ↘20 clay 82.60 blueish green fine tuff argillic rock 83.70 green brecciated andesite	82.00 - 82.25 argillic 82.60 - 83.20 argillic argillic weak - medium	80.10 qtz. vein 0.5 cm 80.70 qtz. + py. vein 2.0 cm 82.00 - 82.25 silicified vein py. rich 82.40 qtz. vein 3.0 cm	100 100 56 100 100
85		blueish green fine grain andesite 86.30 dark green breccia andesite 87.50 blueish green fine grain andesite epidote rich 89.35 dark green breccia andesite		85.00 qtz. vein 0.5 cm	100 100 100 100 100
90		90.40 dark green prophylitic andesite ? 93.10 flow band fine tuff blueish green fine tuff epidote spot	prophylitic		100 100 100 100 100
95		95.50 breccia 96.10 green - dark green prophylitic andesite	prophylitic		100 100 100
100		98.90 dark green andesite breccia 99.80	P4 -9X	98.90 qtz. epidote vein 1.5 cm	100 100

Table 4-24 Geologic Log of Drill Hole MJIE-P4 (3)

Depth (m)	Geologic Column	Lithology	Alteration	Mineralization	RQD
		100.65 dark green andesite epidote rich		100.65 qtz. vein 1.0 cm	100
					100
					100
		dark green andesite (auto breccia)			100
					100
					100
105					100
					100
					100
					100
		109.00 ↘ 30		109.40 qtz. vein 0.5 - 1.0 cm	
		109.40		109.65 qtz. vein 0.5 cm	100
		109.65 grayish green andesite			
110					100
		111.20		111.20 qtz. vein 0.5 cm	
		111.65	111.65 argillic weak	111.65 - 112.00 py. diss.	85
		grayish green auto brecciated andesite			100
					100
					100
115		auto breccia andesite epidote rich			100
		116.50			
		117.00 fine grain andesite breccia andesite			100
		118.10 fine grain andesite			100
		green auto breccia			100
120		andesite			
		120.70		120.70 calcite 1.0 cm	100
		121.75		120.85 calcite 0.5 cm py	100
		dark green brecciated andesite epidote	prophylitic		100
					100
					100
125					100
		breccia			100
		126.70		126.70 calcite 0.5 cm	
		dark green andesite			100
					100
130			P4 -10X	130.00 calcite 0.5 cm	100
					100
					100
		breccia			100
		132.60		132.60 calcite 0.5 cm	100
					100
135				135.00 calcite	100
		135.95	135.95 - 136.13 argillic P4 -15X	135.95 - 136.13 py. rich P4-1A	100
		136.13 dark green andesite			100
		auto brecciated			100
					100
140					100
					100
		142.00		142.00 calcite 0.5 cm	
					100
		dark green andesite			100
145					100
					100
		dark green andesite			100
					100
		149.00		149.00 calcite	
150					100

Table 4-24 Geologic Log of Drill Hole MJIE-P4 (4)

Depth (m)	Geologic Column	Lithology	Alteration	Mineralization	RQD
155		dark green andesite	Prophylitic		100 100 100 100 100
		156.30 silicified zone 156.90	156.30 - 156.90 silicified strong P4 - 16X P4 - 11X	156.30 qtz. vein 2.0 cm 156.39 - 156.90 py. rich 156.90 qtz. vein P4 - 2A P4 - 3A	100 100
160		light green fine grain andessite	prophylitic		100 100 100
		161.30			100
		dark green andesite			100 100
		163.15 ↘50 tuff breccia			100
165		164.30 ↘30	prophylitic		100
		dark green andessite			100 100 100
170			prophylitic		100 100
		dark green andesite			100 100 100 100
175			prophylitic		100
		177.00		179.00 calcite 0.2 cm	100 100
		dark green andesite auto breccia	prophylitic		100 100
180		dark green andesite auto breccia	prophylitic		100 100 100 100 100
185		185.40 ↘20		185.40 calcite vein 1.0 cm	100
		dark green andesite	prophylitic		100 100 100 100
190		dark green andesite auto breccia	P4 - 12X prophylitic		100 100 100 100 110
195		197.65 198.15 fine grain andesite andesitic tuff breccia	prophylitic		100 100 100 100 100

Table 4-24 Geologic Log of MJIE-P4 (5)

Depth (m)	Lithology	Alteration	Mineralization	RQD
	gray - light gray tuff breccia andesite			100 100 100
	204.10 andesite	prophylitic		100
205	204.65			100
	dark green andesite			100 100 100
	208.55 ↘45°	prophylitic	208.55 calcite vein 0.5 cm	100 100
210	210.10 dark green andesite dyke ?		210.10 calcite vein 0.5 cm	100 100
	212.35 ↘50° green tuff breccia			100 100 100
215	green - dark green tuff breccia			100 100 100 100 100
220	green - dark green tuff breccia	P4 - 13X		100 100
	lapilli tuff			100
	tuff breccia			100
225	226.00 fine andesite			100
	226.70 grayish green - light green		226.70 py. vein 0.2 cm	100
	228.35 fine grain andesite ?	228.35 clay 0.2 cm		100
	228.35		228.65 calcite vein 0.5 cm	100
230	229.65 grayish green tuff breccia			100 100
		232.20 clay		100
	234.50 gray fine grain andesite			100 100
235	235.45 lapilli size fragment			48 100
	grayish green tuff breccia			74 64
	239.65	239.75 - 241.10 silicified + argillic	238.65 calcite 0.2 cm P4 - 4A 238.75 py. P4 - 5A	100
240	silicified argillic zone py diss.	240.00 argillic P4 - 17X		77
	241.05 grayish green tuff (lapilli)		240.70 qtz. py.	
	241.15 fine grain andesite	P4 - 14X		100 100
	243.60 auto breccia	243.60 - 243.80 argillic		83
	244.30 grayish-light green andesite			100
245	245.30 ↘50° grayish green tuff breccia			81 100
	248.30 grayish green tuff breccia		248.40 silicified + qtz. vein 10 cm	65 100
250				100
250.50	250.35		250.35 py. vein 0.3 cm	

Table 4-25 Geologic Log of MJIE-SI (1/8)

Direction・Inclination: East, -80°

Depth(m)	Log	Geology	Alteration and Mineralization	RQD	Samples
		Soil(brown)	(none)		
3.90					
		Tuff breccia?	weathered (kaolinized)	23	
5.80		White bleached rock		95	
gradual		Tuff breccia? (red white banded texture. secondary, due to weathering)	weak argillic zone (weathered hematitic red FeOx & silicified laminae)	98 82	
		Tuff breccia?		95 90	
		(similar to flow banded lava.)	weak silicification (hydrothermal alteration	90 65	
		(pumiceous?) porous part silicified part→white rather hard	→FeOx(reddish) (bleached) FeOx(pyrite boxwork)	70 75 50	
		ditto	ditto	100 90 90 100	
19.30				50	
		ditto	ditto	80 60 100 95 100	
		ditto	ditto	80 95 80 40 95	
		29.60～29.70 gray part(pyrite disseminited. argillic fragment)			
		33.40～34.50 gray part		35 60 60 45	
		33.30～34.80 (white)kaolinite?	Oxidized zone (red+white)	80	
		34.90～35.20		80 50	
37.30		Fault zone?	Pyrite disseminated	30 65 45	
		(soft gray clay)	Argillic zone	10 70 95 25	
44.00		------ gradual------			
44.80		------ gradual------		100	
		gray, harder than clay zone	Argillic zone Pyrite disseminated medium～strong	80 85 30 100	
		(Tuff?)		85	

Table 4-25 Geologic Log of MJIE-SI (2/8)

Direction・Inclination: East, -80°

Depth (m)	Log	Geology	Alteration and Mineralization	RQD	Samples
		Argillic compact massive zone gray, harder than clay zone (Original rock: Tuff breccia?)	Pyrite disseminated midium 5~15%	60 80 100 96 95	
55				50 80	
57.50		clay soft, gray	Pyrite disseminated strongly	55 65 96	
60				80 92 100	
64.20		rather hard (a block in fault?)	Pyrite disseminated strongly	100	
65.00				100	
65		clay: soft gray	Pyrite disseminated strongly	80 100 100 100 40	
69.90					
70		rather hard (a block in fault?)	Pyrite disseminated strongly	50 100 80 80 100	
72.60		soft			
74.09					
75			Pyrite disseminated strongly	100 100 60 60 0/100	
77.20					
80		soft very soft	Pyrite disseminated strongly	100 90 94 100 100	
84.00		very weakly consolidated			
85		soft clay gray	Pyrite disseminated	96 90 94 100 98	
85.20					
90		soft clay (partly harder) gray	Pyrite disseminated	83 100 70 100 98	
95		gradually become harder rather hard weakly fractured	Pyrite disseminated strongly	98 100 92 30 40	
96.00					
98.20					
99.00					
100					

Table 4-25 Geologic Log of MJIE-SI (3/8)

Direction・Inclination: East, -80°

Depth (m)	Log	Geology	Alteration and Mineralization	RQD	Samples
100					
101.00		100.95～101.00 soft clay	Pyrite disseminated	20	
				80	
		103.60～103.80		70	
103.60		104.00～(qtghan)		30	
104.20		100		60	
104.70					
105					
105.10		softer		20	
		106.90 (gradual)		95	
107.10		(harder)		100	
108.80		Andesite? (corpart masive)		90	
		100 110.0 gradud		34	
HQ 110					
111.00			Pyrite 5～10% argillic	40	
111.65				40	
112.45		Andesite (?)	Pyrite disseminated (3～5%) phyllic-propylitic? argillic	50	
NQ				100	
114.45		(dark-gray greenish? compart hard)	114.00～: silicified weakly Pyrite intensely disseminated (10%)	45	
115					
115.25		chilled magine		20	
115.70 ～115.80		Gray silliceous rock (fine tuff orgin?)		50	
		117.50～117.70: andesite (block?)	Pyrite disseminated weakly-moderately	35	
		Coarse tuff, gray rather soft		86	
119.85		119.55-119.85 fine ～ sandy tuff		27	
120					
		andesite diabase texture		75	
121.20			argillic alteration		
121.95		coarse tuff		25	
		sandy tuff		50	
123.20					
124.00		andesite		90	
		tuff (silems)		50	
125					
125.10		soft clay		55	
125.85		Tuff (?) argillic		80	
		127.85～127.95 soft clay		95	
128.25		soft clay		55	
129.75				85	
130					
		130.45～136.85: Gray soft clay		85	
		Fine tuff gray partly rather hard		80	
133.55		133.15～.25: clay		65	
		Dacitic tuff breccia? Pale gray～gray		75	
135				50	
			Pyrite: strong, veinlets～dissemination	50	
137.10				55	
		Andesite rather hard	Pyrite: weak, argillic	100	
138.35		139.20～: Soft clay		90	
139.20				95	
140					
		Andesite? (Argillic rock) (massive copact, rather hard)	Pyrite: strong	100	
		dark-gray dots (py+SiO_2)		100	
1433.50～		Andesite	Alunite? yellowish mineral	90	
144.65		(Fine tuff?)		95	
		144.65～144.90: clay fractured		80	
145					
		Lapillituff～Tuff breccia rather hard		65	
		146.60: weakly gray-dark green Andesite breccia (lava?)		75	
			Epidote in amygdals	75	
		148.55 (2cm) clay		85	
		149.25 (2cm) clay		85	
150					

Table 4-25 Geologic Log of MJIE-SI (4/8)

Direction・Inclination: East, -80°

Depth (m)	Log	Geology	Alteration and Mineralization	RQD	Samples
150		150.00～150.35 clay(soft)tuff		95	
		150.85 dark-gray～greenish-gray		90	
		fractured			
		Tuff breccia～	pyrite disseminated	62	
		blueish-green dark green			
		152.90～153.05(propylite?)	kaoline like	92	
		weakly fractive	white minaral		
		matrix blacky(silica+Maox2)	dominant	70	
		fragment:blue-green			
155		whitish tuff		55	
		Lapilli size fragment dominant		70	
			sericitic	86	
			clay		
			dominant	62	
				92	
160				95	
		161.00～161.20fractureal clay		55	
				48	
		163.10	pyrite:veinlets width<1 mm hair		
		20° 60°	(dense, 2～3cm interval)	60	
		164.50～165.40 white clay soft		38	
165		gray		40	
		166.60	fault	55	
		soft clay			
		167.55		64	
		Tuff breccia	chlorite-sericite propylitic	80	
		blueich-green rather hard	+ pyrite (moderate～strong)	85	
170			pyrite streak along cracks	96	
			(width<1mm)	65	
		22°		100	
		-0°			
		173.85		70	
				84	
175		Lapilli size>Tuff breccia		80	
		rather soft		88	
		gray matrix			
		～white		78	
		fragment:greenish lapill		65	
				92	
180		Lapilli tuff - tuff breccia		85	
				90	
		gradual		90	
		Tuff breccia			
		fragment:gray andesite ϕ=10cm		85	
		matrix greenish(ash-laplli)		35	
185		20 ° pyrite disseminated			
		fragment:matrix=1:1		35	
		megascopically homogeneous		55	
		187.55 (40°) clay(soft)	187.55	82	
			pyrite disseminated:weakly	75	
		60° Coarse tuff～lapilli tuff	moderate amount		
		10°		82	
190		191.20－191.35		75	
		192.20 Tuff breccia		88	
		lapillituff～tuff breccia		78	
		(green patch tuff)			
		193.70		70	
		clay-argillic gray soft		77	
195		Tuff breccia		55	
				74	
				75	
				75	
200				78	

Table 4-25 Geologic Log of MJIE-SI (5/8)

Direction・Inclination: East, -80°

Depth (m)	Log	Geology	Alteration and Mineralization	RQD	Samples
200		Andesitic tuff breccia	Pyrite partly strongly disseminated veinlets	75	
		Fragments: gray max10cm r-hard finegramed andesite	-pool near the boundary between fragments	98	
		matrix: smaller size green colored, rather soft gradual		95	
		gradual		91	
		→matrix: similar color (green)		92	
205				98	
				90	
				87	
				94	
				96	
210				100	
			211.0 qtz druse 5mm (pool)	16	
			212.40 white mineral vein	55	
		213.25	213.25~213.30 (5cm) gray-pyrite clay	52	
		Andesite?		42	
215		(weakly breacciated lava?)		55	
216.65		216.65	propylitic	65	
		Andesitic tuff breccia (Auto brecciated lava?)	very weak argillic (bluiesh-green)	65	
				76	
220				54	
				78	
			222.85	34	
		222.60~222.65 (5cm) breccia	weak argillic moderate silicification	20	
				15	
		224.23	224.23 grayish	75	
225		225.00	225.00 soft clay+brecciated	12	
			225.80 weakly brecciated (gradual)	33	
			227.00	57	
			228.25-228.50 (0.25) clay	35	
				36	
230			pyrite dissemnation strong~medium	20	
			232.85 clayish breccia	55	
			233.65	45	
			234.10~234.20: clay	15	
			234.55	20	
235			weak brecciation with clay pyrite diss. strong	10	
				35	
		237.50		60	
		40		96	
		30		60	
240		10		30	
		241.100~251.55		40	
		Tuff breccia compact	sillicification strong moderate~weak argillization pyrite dissemination	65	
				80	
				85	
245		246.70~248.85 porus (fine tiff?)	247.60~247.00 argillic	90	
				60	
		Fine tuff?		55	
		248.85		45	
250		249.95~245.00 fractured	sillicification moderate~weak	40	

Table 4-25 Geologic Log of MJIE-SI (6/8)

Direction・Inclination: East, -80°

Depth(m)	Log	Geology	Alteration and Mineralization	RQD	Samples
250		250.10	250.10～250.50	12	
		250.40 Tuff breccia	251.60～250.76	52	
		gray, rather-hard rather-compact	pyrite:moderte-strong	65	
			argillization: moderate	40	
255				15	
			255.10～255.25: fractured	55	
			255.40～255.75: clay	35	
		257.60	257.30～257.50: fractured, pyrite	16	
		259.80	257.60～258.80: partly strong argillization, pyrite disseminaed	–	
260				0	
			260.00～260.33 clay	44	
				73	
		262.30	262.10～0.5cm: calcite veinlet	53	
		262.90 Tuff breccia gray hard	262.30～262.90:gray clay, fractured, pyrite	85	
			pyrite:moderate-strong	34	
265		265.40		17	
		Breccia zone dark gray	Pyrite: strong Argillization: strong	60	
		266.40		60	
		Tuff breccia～lapilli tuff porous		84	
270				44	
		Tuff breccia rather compact		40	
273.60				30	
		Tuff breccia→tuff (gradual)		52	
274.00				52	
275				46	
		Tuff(coarse tuff) irreglar blackly layered		58	
				60	
				33	
				21	
279.95				65	
280		Andesite	alunite? pyrite	62	
		282.20		34	
		282.75 fractured andesite? compact		32	
				30	
				40	
285		285.0		45	
		Andesite tuff breccia	285.18～285.25 argillic zone	32	
			287.30～288.30: soft clay, gray	5	
		289.10～289.20:fractured zone	288.60～288.65: soft clay (10-20°)	10	
				30	
290		Diortic～porphyritic rock	K-feldspar? Pyrite diss.moderate ～strong, pinky color alunite	20	
291.81		291.85～292.35 clay		20	
292.35		292.35～293.75 rather hard	argillization clay(kaoline)	10	
		293.75～293.90(0.15) clay		15	
		294.10～295.20 fractured		20	
295		Tuff breccia?	295.35～75(0-30°) clay pyrite diss. moderate～strong	15	
			295.50: pyrite hair(20')	12	
		298.00～298.35(0.35) clay	slicification+pyrite-kaoline	40	
				10	
300		Igneous rock (porphyry?)		65	

Table 4-25 Geologic Log of MJIE-SI (7/8)

Direction・Inclination: East, -80°

Depth (m)	Log	Geology	Alteration and Mineralization	RQD	Samples
300.85		Silicified tuff breccia?		35	
301.25		Brecciated	301.25 kaoline veinlet (0°) (weakly argillic altered) pyrite dis s	35	
302.90		80° gray~hard compact rock	302.90: white clay+pyrite 80°	95	
			304.20 (qtz+hemetite) white clay 45°+30°	95	
				92	
306.10			qtg v l 2mm 40° chalcedonic	92	
			qtg v l - 70°-	88	
307.65		gray		85	
grodual				95	
309.85		dark gray+partly green	py. diss: partly strong	35	
		fractured clay		90	
312.00		py diss helf traghet +matrix: (porphyritic) 20	309.85~309.90 (0.03 clay)	94	
			311.00 2mm soft white clay	96	
			313.85 (0°) pyrite veinlet Argillic (Kaoline -pyrophyllite)	90	
			314.40 pyrite veinlet, kaoline halo	60	
		315.65	+pyrite +serite	90	
		green dotin wht matrix (alterdin)		95	
317.00				100	
		318.20~318.40: fracted	318.30 pyrite veinlets (0~10°)	50	
		319.20	319.20		
			319.20~30 (45) py strong +white clay	20	
		weakly fractured partly clay	320.60 clay	30	
		321.25 clayey		65	
		compact	silicification: weak, pyrite: strong~moderate	95	
		clay (pinky part) + quartz+pyrite	323.25 weakly argillic (clay)	70	
			323.80 fractured (weak: 0.40)		
		324.00 (10°) Alunite? veinlet	324.60 (5°) pyrite veinlet	100	
			325.00 late calcite veinlet	100	
			argillic silicified	100	
			pyrite strong	95	
				95	
			326.90	60	
			330.75 pyrophylitic mixed zone	25	
		Tuff breccia		50	
				100	
		334.00: gradual	propylitic	95	
		60°		93	
			336.20 quartz+magnetite	60	
		(Brecciated lava?)		95	
			338.30: qtz+magnetite (width: 1mm)	100	
			338.70: qtz+pyrite (width: 2mm)	85	
		30° 338.70 339.00			
			339.50	60	
			silicified+clay pyrite (strong)	30	
		341.30	341.35	65	343.80 s 6.351
		342.65 Fine tuff?	sericite, pyrite+magnetite	100	
		Andesite + Fine tuff			
343.75			343.75	70	
		(Andesite dyke?)			
344.65		dark green		95	
			345.00 (0°): pyrite veinlet (1mm)	90	
		Tuff breccia	346.00 (10°): pyrite veinlet (1mm)	100	
			Chlorite+ pyrite zone	100	
		gradual 347.00		60	
		Tuff~tuff breccia	350.00: magnetite veinlet	90	

Table 4-25 Geologic Log of MJIE-SI (8/8)

Direction・Inclination: East, -80°

Depth (m)	Log	Geology	Alteration and Mineralization	RQD	Samples
350					
351.00		Tuff breccia 45 Andesite (dyke?) dark-gray	py: moderate～strong	90 85 60 85 98	353.25～354.25 S1-72:6.90%S
355		Lapilli tuff (353.90～357.10) propylitic	weakly-silicified 357.10 357.80 propylitic White mineral stockwork in propylitic rock	100 100 100 100 100	
360		360.30～360.80 propylitic greenish magnetite rich	pyrite:moderate	100 98 100 100 96	
365		365.45～360.40 silicified (grayish) pyritediss moderately		80 80	
		20°	White mineral stockwork in propylitic rock 368.40 Molybdenite-qtz.veinlet 368.75 (1mm) with pyrite, clay 0°～80° py veinlets	96 100 100	S1-76 368.40 102ppm Mo
370			370.15:Pyrite veinlet (1mm) 371.42:Pyrite veinlet (1mm)	97	
371.40		371.40～372.00:block in tuff br? block:andesite	pyrite: strong 372.90:Mt.chl.epidote 1cm	96 96 94	
374.00		374.15 374.40～376.40 porphyritic Andesite	374.15:py.epidote,chl veinlet,1mm	100 100 95	
375		porphyritic Andesite 378.40～37 378.40	376.40～376.70 dioritic (coarse grain)	100	
380			378.35: 1mm py (60°) Magnetite:weak 379.05: 1mm py (65°) epidote 379.50 1mm py	100 100	
		381.00～381.20 Andesite 381.95～382.00 ndesite 382.55～382.65 Andesite Andesite? (porphyritic)	380.50 5mm py sericite (80°) 381.85 1mm qtz (86°) pyrite moderate 382.85 8mm py, chl, qtz (30°) 384.30 1mm py, chl, qtz (45°)	100 100 100 96	
385		384.50～385.00 Andesite	385.65 1mm sericite, qtz, chl py (0°)	100	
		386.70～386.80 dark green greenish white	386.20: 1mm qtz (cut qtz veinlet, 70°) 386.80: 1mm py (80°) 386.95: 1mm py (40°) 387.15: 2mm py (40°) 387.30～387.40 10mm clay (40°) 387.60: 1mm py (5°) 388.20: 1mm py (9°) 388.50: 1mm py py.w～m	100 95 100 98 99	
390					
391.15		390.85～391.15 silicified zone silicified block? Tuff breccia	389.05: 1mm py chl (30°) 389.20: (25°) 390.10: (85°) weak argillic pylite modeate yellowish white 390.15: py (60°)	100 98 75	
393.00～		greenish dioritic rock	390.95:Pyrite 391.05:Pyrite	55	
395.00		395.00 weakly fractured	394.90～395.00:chl-sericite-pyrite	40	
395		clay (?)	(lost core)	0 0	
		Tuff breccia	pyite: moderat weakly silicified clayey pyrite:strong-moderate	0 10	
399.40～400.50			argillic, weakly silicified	80	
400					

400.50
EOH
2/11

Table 4-26 Chemical Analysis Results of Drill Hole Samples, Prambon District

Sample No.	Depth(m)	Au ppb	Au ppm	Ag ppm	Al %	As ppm	B ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ga ppm	Hg ppm	K %
P1-1	41.41～41.65	156		0.8	0.57	22	<10	20	<0.5	<2	8.37	<0.5	17	21	19	5.72	<10	<1	0.16
P1-2	41.65～41.92	52		0.5	1.3	21	<10	20	<0.5	<2	4.08	<0.5	17	21	28	4.97	<10	<1	0.2
P1-3	41.92～42.75	63		1.1	0.55	52	<10	20	<0.5	<2	0.34	<0.5	16	58	29	2.81	<10	1	0.23
P1-4	4275～43.9	31		1.7	0.44	49	<10	20	<0.5	<2	0.46	<0.5	13	122	28	2.27	<10	1	0.22
P1-5	43.90～44.55	4,915		12.3	0.42	163	<10	20	<0.5	<2	0.25	24.4	19	63	867	6.09	<10	1	0.19
P1-6	44.55～45.77	208		1	0.7	34	<10	30	<0.5	<2	2.53	<0.5	18	75	85	4.44	<10	<1	0.26
P1-7	45.77～45.87	4,167		30.2	0.25	34	<10	10	<0.5	<2	0.2	59.4	9	210	934	2.28	<10	1	0.14
P1-8	45.87～46.90	52		1.7	0.58	89	<10	20	<0.5	<2	1.34	<0.5	21	62	23	4.09	<10	<1	0.24
P1-9	46.90～47.40	323		8.4	0.32	92	<10	20	<0.5	<2	0.23	2.9	14	206	132	5.28	<10	1	0.18
P1-10	47.40～48.40	141		1.3	0.52	39	<10	20	<0.5	<2	0.36	<0.5	20	89	32	3.44	<10	<1	0.23
P1-11	50.55～51.22	513		4.6	0.36	38	<10	40	<0.5	<2	1.16	0.7	15	125	176	3.42	<10	1	0.2
P1-12	51.22～52.70	52		1.4	0.47	46	<10	30	<0.5	<2	1.49	<0.5	19	69	22	4.85	<10	1	0.26
P1-13	52.70～53.05	125		7.7	0.39	97	<10	20	<0.5	<2	1.44	<0.5	17	107	50	8.65	<10	1	0.22
P1-14	68.6～68.90	219		4	0.44	105	<10	30	<0.5	<2	3.7	1.8	12	110	58	5.18	<10	<1	0.25
P1-15	70.85～71.35	156		3.3	1.06	43	<10	30	<0.5	<2	6.82	<0.5	11	61	69	3.53	<10	<1	0.22
P1-16	73.63～74.82	94		3.1	0.39	105	<10	30	<0.5	<2	0.44	<0.5	13	114	18	5.24	<10	<1	0.25
P1-17	82.70～83.70	52		1.2	0.51	64	<10	20	<0.5	<2	1.18	<0.5	14	59	19	4.38	<10	<1	0.24
P1-18	83.70～84.0	104		1.8	0.37	134	<10	40	<0.5	<2	0.6	0.7	12	114	23	4.89	<10	1	0.25
P1-19	84.0～84.90	52		1.9	0.38	69	<10	50	<0.5	<2	0.26	<0.5	13	109	17	4.61	<10	<1	0.25
P1-20	84.90～85.90	193		3	0.35	172	<10	20	<0.5	<2	0.14	0.7	14	161	31	8.23	<10	1	0.22
P1-21	85.90～87.0	42		16.8	0.29	95	<10	20	<0.5	<2	0.28	<0.5	15	274	593	9.65	<10	1	0.19
P1-22	87.0～88.0	52		18.7	0.32	173	<10	20	<0.5	<2	0.66	1	14	409	743	10.5	<10	<1	0.19
P1-23	88.0～88.2	551		37.5	0.41	57	<10	20	<0.5	<2	0.48	0.8	19	118	54	5.21	<10	<1	0.25
P1-24	88.80～89.40	10,420		>100	0.26	116	<10	20	<0.5	<2	0.4	6.2	11	484	160	3.07	<10	1	0.15
P1-25	164.5～165.23	21		1.3	1.08	56	<10	20	<0.5	<2	5.65	<0.5	18	28	11	4.89	10	<1	0.21
P1-26	165.23～165.55	94		3.1	0.88	687	<10	50	<0.5	<2	0.9	1.7	15	164	24	3.82	<10	<1	0.28
P1-27	165.55～166.25	83		1.1	0.97	102	<10	30	<0.5	<2	1.92	0.7	16	69	18	3.08	<10	<1	0.2
P1-42	107.50-107.90	94		7.7	0.35	479	<10	60	<0.5	<2	0.12	0.8	16	234	22	4.29	<10	1	0.2
P1-43	107.90-108.90	42		1.9	0.49	173	<10	100	<0.5	<2	0.2	<0.5	12	114	31	2.62	<10	<1	0.26
P1-44	108.90-109.5	141		14.7	0.38	174	<10	100	<0.5	<2	0.87	1.2	17	211	25	3.15	<10	<1	0.2
P1-45	117.70-118.00	63		2.2	0.49	197	<10	30	<0.5	<2	0.2	<0.5	25	93	11	4.61	<10	<1	0.24
P2-1	84.50	97		0.8	0.51	8	<10	30	<0.5	<2	1.58	<0.5	9	138	36	1.32	<10	<1	0.3
P2-2	82.65	153		1.7	0.55	55	<10	30	<0.5	<2	10	<0.5	30	172	407	4.56	<10	1	0.29
P2-3	94.85～95.23	83		3.9	0.5	157	<10	90	<0.5	<2	0.24	11.2	16	112	60	2.74	<10	<1	0.27
P2-4	95.23～95.64	306		86.1	0.07	314	<10	<10	<0.5	<2	1.14	4.5	6	510	56	1.48	<10	<1	0.04
P2-5	95.64～95.95	125		3.1	0.33	323	<10	10	<0.5	<2	1.2	4.8	12	222	47	2.65	<10	<1	0.21
P2-6	95.95～96.65	167		12.2	0.35	140	<10	10	<0.5	<2	2.47	12.4	15	210	94	3.14	<10	<1	0.21
P2-7	96.65～97.15	181		2.9	0.3	62	<10	10	<0.5	<2	3.2	3.2	15	189	41	3.17	<10	<1	0.18
P2-8	97.15～97.80	125		2.1	0.53	40	<10	150	<0.5	<2	0.43	3.7	15	110	62	2.27	<10	<1	0.32
P2-10	131.13～131.45	181		2.2	1.06	138	<10	20	<0.5	<2	10.35	<0.5	17	51	53	4.32	<10	<1	0.24
P2-11	159.60～159.66	116		9.8	0.31	8	<10	350	<0.5	<2	10.7	0.5	3	231	89	1.17	<10	<1	0.21
P2-12	161.45～161.49	265		10.8	0.25	564	<10	100	<0.5	<2	2.76	0.9	5	348	136	1.88	<10	<1	0.16
P2-13	164.87～165.25	167		2.3	0.53	108	<10	70	<0.5	<2	9.49	<0.5	10	112	66	4.32	<10	<1	0.31
P2-14	168.70～169.10	153		3	0.57	293	<10	60	<0.5	<2	2.21	<0.5	20	25	65	4.12	<10	<1	0.32
P2-15	169.10～169.55	153		3.4	0.3	195	<10	90	<0.5	<2	1.94	<0.5	11	373	64	3.31	<10	<1	0.19
P2-16	169.55～170.30	14		2.2	0.65	114	<10	50	<0.5	<2	4.89	<0.5	17	24	57	4.63	<10	<1	0.37
P2-17	177.00～178.30	56		2.3	0.7	86	<10	120	<0.5	<2	4.98	<0.5	14	24	61	3.36	<10	<1	0.36
P2-18	178.30～179.30	167		5.1	0.44	392	<10	20	<0.5	<2	4.52	0.7	14	162	46	4.25	<10	<1	0.28
P2-19	179.30～180.30	69		3.6	0.54	240	<10	60	<0.5	<2	4.8	<0.5	17	36	67	3.96	<10	<1	0.32
P2-20	180.30～181.20	56		6.1	0.56	320	<10	50	<0.5	<2	4.73	<0.5	15	33	56	4.79	<10	<1	0.32
P2-21	181.20～181.68	70		4.5	0.28	136	<10	30	<0.5	<2	1.36	<0.5	9	303	35	2.91	<10	<1	0.17
P2-22	181.68～182.00	56		6	0.64	272	<10	50	<0.5	<2	1.04	<0.5	15	96	76	4.26	<10	<1	0.3
P2-23	182.00～182.5	125		5.3	0.06	27	<10	10	<0.5	<2	5.1	1.5	3	421	162	1.76	<10	<1	0.04
P2-24	182.50～183.17	250		5.8	0.2	98	<10	20	<0.5	<2	1.5	0.8	6	431	124	2.24	<10	<1	0.14
P2-25	183.17～183.80	278		12.5	0.11	228	<10	10	<0.5	<2	14.3	2.3	3	321	172	2.51	<10	<1	0.07
P2-26	183.80～184.20	97		5.7	0.41	251	<10	40	<0.5	<2	1.54	0.8	14	132	79	3.35	<10	<1	0.25
P2-27	184.20～185.00	28		5.3	0.05	32	<10	<10	<0.5	<2	13.45	6.2	2	293	351	1.42	<10	<1	0.03
P2-28	185.00～186.00	347	0.324	4.6	0.35	176	<10	30	<0.5	<2	1.28	4	10	270	138	3.11	<10	<1	0.22
P2-29	186.00～187.00	333	0.266	4	0.32	67	<10	20	<0.5	<2	4.78	2.6	6	440	128	1.94	<10	<1	0.19
P2-30	187.00～188.00	28		2.5	0.6	126	<10	50	<0.5	<2	3.27	<0.5	13	26	68	2.52	<10	<1	0.31
P2-31	188.00～188.70	49		3.1	0.51	114	<10	40	<0.5	<2	2.69	1.7	11	104	75	2.7	<10	<1	0.27
P2-35	198.35～199.20	250		5.2	0.21	97	<10	20	<0.5	<2	8.5	2.1	4	374	81	2.26	<10	<1	0.08
P2-36	199.20～199.45	125		3.1	1.16	294	<10	40	<0.5	<2	1.5	<0.5	16	70	40	4.58	<10	<1	0.26
P2-37	199.45～200.60	250		3.6	0.31	119	<10	20	<0.5	<2	14.1	2	5	184	174	2.6	<10	<1	0.12
P2-38	200.60～201.35	139		3.8	0.52	260	<10	30	<0.5	<2	4.29	<0.5	11	149	55	3.32	<10	<1	0.26
P2-39	201.35～202.00	1035	0.987	4	0.49	259	<10	30	<0.5	<2	1.06	<0.5	10	170	28	3.16	<10	<1	0.25
P2-40	202.00～203.00	69		3.8	0.5	316	<10	20	<0.5	<2	3.97	<0.5	9	94	26	4.04	<10	<1	0.28
P2-41	203.00～204.00	42		3.2	0.49	135	<10	30	<0.5	<2	2.79	<0.5	13	87	40	3.29	<10	<1	0.31
P2-42	204.00～205.25	153		3.1	0.53	194	<10	50	<0.5	<2	2.68	<0.5	13	64	34	4.31	<10	<1	0.32
P2-43	207.65～208.55	56		1.7	0.51	107	<10	20	<0.5	<2	3.99	<0.5	12	154	34	3.97	<10	<1	0.27
P2-44	245.70～246.90	154		1.9	0.45	126	<10	20	<0.5	<2	4.84	<0.5	12	142	33	3.75	<10	<1	0.22
P2-45	246.90～247.34	230		5.3	0.34	496	<10	20	<0.5	<2	1.04	<0.5	12	241	35	3.43	<10	<1	0.24
P2-46	247.34～248.55	269		3.2	0.33	148	<10	20	<0.5	<2	1.06	<0.5	10	191	31	2.45	<10	<1	0.22
P2-47	248.55～249.55	231		3.2	0.35	181	<10	20	<0.5	<2	1.42	0.5	11	291	66	3.28	<10	<1	0.22
P2-48	249.55～250.20	83		2.2	0.43	148	<10	20	<0.5	<2	2.45	<0.5	11	169	26	2.72	<10	<1	0.26
P2-49	250.20～250.63	82		8.2	0.5	954	<10	20	<0.5	<2	7.75	<0.5	10	150	104	6.43	<10	<1	0.24
P2-56	94.75～94.85	21		1.3	0.84	36	<10	30	<0.5	<2	4.03	<0.5	9	24	32	4.61	<10	<1	0.49
P2-57	97.80～97.90	40		1.5	0.5	22	<10	20	<0.5	<2	3.72	3.6	10	28	28	1.84	<10	<1	0.28
P2-58	168.60～168.70	20		1	0.74	44	<10	50	<0.5	<2	7.36	<0.5	11	12	73	2.26	<10	<1	0.42
P2-59	188.70～188.80	19		0.5	2.08	37	<10	80	0.5	<2	5.11	<0.5	18	5	43	4.11	<10	<1	0.27
P2-60	198.25～198.35	0		0.7	2.15	122	<10	70	<0.5	<2	6.05	<0.5	28	6	40	4.38	<10	<1	0.25
P2-61	205.25～205.35	80		1.4	1.63	118	<10	40	<0.5	<2	2.03	<0.5	14	36	34	4.32	<10	1	0.34
P2-62	245.60～245.70	56		0.7	0.97	32	<10	30	<0.5	<2	6.59	<0.5	17	61	41	3.15	<10	<1	0.36
P2-63	250.63～250.73			0.8	0.72	59	<10	30	<0.5	<2	4.83	<0.5	9	42	39	2.72	<10	<1	0.36
P3-1	41.25～41.50	821	0.908	23.3	0.58	2900	<10	10	<0.5	<2	0.95	<0.5	16	91	29	3.64	<10	<1	0.29
P3-2	41.50～42.47	83		4.2	1.07	164	<10	10	<0.5	<2	1.68	<0.5	13	48	48	2.78	<10	<1	0.32
P3-3	42.47～43.20	14		2.4	1.48	219	<10	10	<0.5	<2	4.7	<0.5	17	47	63	4.04	<10	<1	0.33
P3-4	42.20～43.55	139		2.5	2.19	190	<10	10	<0.5	<2	6.41	0.6	31	171	43	6.47	<10	1	0.22
P3-10	41.15～41.25	40		8	1.58	416	<10	10	<0.5	<2	1.4	<0.5	22	27	45	4.71	<10	<1	0.34
P3-11	43.55～43.65	19		0.6	1.5	11	<10	20	<0.5	<2	7.2	<0.5	15	7	47	2.5	<10	1	0.36
P3-16	172.90～173.35	39		0.3	2.94	9	<10	30	<0.5	<2	5.45	<0.5	14	4	61	4.71	10	<1	0.29
P3-17	174.20～174.50	11		0.5	2.26	80	<10	20	<0.5	<2	7.48	<0.5	16	9	61	4.21	10	1	0.23
P3-18	175.00～175.50	55		0.2	2.74	18	<10	20	<0.5	<2	11	<0.5	16	21	42	4.23	10	<1	0.21
P3-20	173.35～174.20	21		0.4	3.21	31	<10	30	<0.5	<2	4.58	<0.5	16	4	62	4.92	10	<1	0.35
P3-21	174.50～175.0	19		0.2	2.43	9	<10	30	<0.5	<2	4.84	<0.5	12	5	55	3.98	10	<1	0.29
P3-23	241.2～241.33		0.027	3.5	0.43	21	<10	10	<0.5	<2	3.25	1.4	48	25	246	1.05	<10	<1	0.08
P4-1A	135.8～136.07	52		2	0.91	351	<10	10	<0.5	<2	7.12	8.8	18	206	88	4.87	<10	<1	0.16
P4-2A	156.33～156.65	42		1	0.52	185	<10	10	<0.5	<2	6.2	0.9	18	61	14	2.91	<10	<1	0.26
P4-3A	156.65～156.95	177		11.6	0.31	335	<10	<10	<0.5	10	2.24	24.4	8	471	233	5.59	<10	<1	0.1
P4-4A	239.65～240.47	63		0.5	0.83	60	<10	10	<0.5	<2	8.79	<0.5	10	44	15	2.69	<10	<1	0.16
P4-5A	240.47～241.1	42		0.6	0.63	64	<10	10	<0.5	<2	1.72	<0.5	9	118	16	2.71	<10	<1	0.18
P4-6A	78.60～79.10	222		3.6	0.46	260	<10	10	<0.5	<2	2.35	29.1	8	202	76	4.5	<10	<1	0.18

Sample No.	La ppm	Mg %	Mn ppm	Mo ppm	Na %	Ni ppm	P ppm	Pb ppm	S %	Sb ppm	Sc ppm	Sr ppm	Ti %	Tl ppm	U ppm	V ppm	W ppm	Zn ppm	Zn %	Ag ppm
P1-1	10	2.52	2560	2	0.01	<1	460	7	2.95	<2	9	61	<0.01	<10	<10	60	<10	53		
P1-2	10	1.48	1625	1	0.01	1	630	3	2.06	<2	10	39	<0.01	<10	<10	63	<10	68		
P1-3	<10	0.19	282	4	<0.01	5	520	10	2.65	<2	4	16	<0.01	<10	<10	19	<10	68		
P1-4	10	0.15	295	8	<0.01	4	440	24	2.03	<2	4	12	<0.01	<10	<10	18	<10	120		
P1-5	<10	0.19	519	10	<0.01	4	490	1690	5.67	4	5	14	<0.01	<10	<10	31	<10	5060		
P1-6	<10	0.26	977	3	0.01	5	580	32	2.56	<2	9	31	<0.01	<10	<10	43	<10	88		
P1-7	<10	0.06	232	9	<0.01	8	250	2260	2.85	2	2	8	<0.01	<10	<10	10	<10	>10000	1.31	
P1-8	<10	0.27	503	3	0.01	3	560	16	3.51	<2	7	22	<0.01	<10	<10	30	<10	82		
P1-9	<10	0.07	98	11	<0.01	8	300	436	5.77	<2	2	11	<0.01	10	<10	12	<10	728		
P1-10	<10	0.14	244	3	0.01	4	510	7	2.94	<2	4	17	<0.01	<10	<10	21	<10	104		
P1-11	<10	0.22	388	7	<0.01	5	400	60	3.13	<2	3	15	<0.01	<10	<10	17	<10	246		
P1-12	<10	0.43	731	3	0.01	3	570	8	3.21	<2	5	21	<0.01	<10	<10	35	<10	77		
P1-13	<10	0.37	745	7	0.01	4	450	24	7.76	2	5	18	<0.01	10	<10	35	<10	132		
P1-14	10	0.45	1770	5	0.01	2	510	184	6.08	<2	2	24	<0.01	<10	<10	10	<10	421		
P1-15	10	0.58	2850	3	0.01	1	490	11	2.47	<2	4	37	<0.01	<10	<10	28	<10	58		
P1-16	<10	0.06	138	5	0.01	3	590	21	6.01	<2	2	18	<0.01	<10	<10	9	10	39		
P1-17	<10	0.22	459	3	0.01	<1	580	13	4.7	<2	4	21	<0.01	<10	<10	12	<10	41		
P1-18	<10	0.1	182	6	0.01	3	460	24	5.61	2	3	15	<0.01	<10	<10	9	<10	80		
P1-19	<10	0.06	61	7	0.01	2	530	26	5.24	<2	3	14	<0.01	<10	<10	9	<10	104		
P1-20	<10	0.03	32	8	<0.01	5	420	51	9.27	2	2	12	<0.01	<10	<10	9	<10	166		
P1-21	<10	0.03	61	18	0.01	16	310	152	>10.0	3	2	10	<0.01	20	<10	12	10	102		
P1-22	<10	0.09	232	19	<0.01	19	280	212	>10.0	2	3	12	<0.01	10	<10	15	10	308		
P1-23	<10	0.05	94	7	0.01	5	490	202	6.01	<2	4	18	<0.01	<10	<10	14	<10	274		
P1-24	<10	0.07	210	22	<0.01	19	220	971	2.96	4	2	9	<0.01	<10	<10	16	10	1665		316
P1-25	10	0.51	1515	2	0.02	<1	580	10	2.91	<2	12	44	<0.01	<10	<10	60	<10	62		
P1-26	<10	0.27	359	10	0.03	6	410	30	3.86	13	5	31	<0.01	10	<10	29	<10	312		
P1-27	<10	0.36	667	5	0.02	2	480	8	2.18	2	6	31	<0.01	<10	<10	35	<10	215		
P1-42	10	0.04	54	22	0.01	11	270	63	4.59	12	2	13	<0.01	<10	<10	15	10	342		
P1-43	10	0.08	102	6	0.01	4	520	8	2.57	2	3	17	<0.01	<10	<10	18	<10	107		
P1-44	<10	0.05	97	22	0.01	9	270	144	3.41	4	2	21	<0.01	<10	<10	14	<10	453		
P1-45	<10	0.07	56	5	0.01	2	440	7	5.09	3	3	21	<0.01	<10	<10	15	<10	77		
P2-1	10	0.12	441	5	0.01	7	600	4	0.53	<2	4	25	<0.01	<10	<10	19	<10	116		
P2-2	10	2.56	5320	6	0.01	26	430	5	1.8	<2	3	77	<0.01	<10	<10	9	10	118		
P2-3	<10	0.07	176	14	<0.01	17	480	183	2.85	3	3	19	<0.01	<10	<10	13	<10	1400		
P2-4	<10	0.14	812	18	<0.01	21	30	138	0.76	11	<1	9	<0.01	<10	<10	9	10	675		
P2-5	<10	0.08	569	10	<0.01	16	290	74	2.68	2	2	18	<0.01	<10	<10	13	<10	901		
P2-6	<10	0.09	1065	8	<0.01	22	330	550	2.89	2	3	22	<0.01	<10	<10	15	<10	1780		
P2-7	<10	0.15	1525	9	<0.01	16	260	66	2.73	2	3	31	<0.01	<10	<10	11	30	578		
P2-8	<10	0.1	314	5	<0.01	16	610	77	2.01	<2	3	22	<0.01	<10	<10	14	<10	794		
P2-10	<10	1.62	4080	5	0.01	20	430	8	2.51	<2	6	69	<0.01	<10	<10	28	<10	56		
P2-11	<10	0.31	5640	7	0.01	11	110	27	0.33	<2	3	48	<0.01	<10	<10	10	10	67		
P2-12	<10	0.13	1695	13	<0.01	16	150	17	1.32	10	1	14	<0.01	<10	<10	11	10	220		
P2-13	10	2.27	4970	7	0.01	11	450	10	1.82	<2	6	84	<0.01	<10	<10	17	<10	69		
P2-14	<10	0.18	897	2	0.02	12	760	11	4.47	<2	7	40	<0.01	<10	<10	13	<10	74		
P2-15	<10	0.31	1285	13	<0.01	21	270	17	2.77	2	2	20	<0.01	<10	<10	11	10	72		
P2-16	10	0.85	3180	4	0.02	9	830	11	2.2	<2	9	50	<0.01	<10	<10	35	<10	44		
P2-17	10	0.58	3190	2	0.03	9	760	9	1.98	<2	7	57	<0.01	<10	<10	19	<10	94		
P2-18	<10	0.14	2030	7	0.01	14	460	43	4.69	4	3	33	<0.01	<10	<10	10	<10	307		
P2-19	<10	0.24	2820	2	0.02	12	720	11	4.04	<2	7	43	<0.01	<10	<10	13	<10	63		
P2-20	<10	0.26	3470	2	0.02	11	660	13	4.87	3	6	42	<0.01	<10	<10	14	<10	84		
P2-21	<10	0.39	839	12	<0.01	18	270	14	2.54	<2	2	16	<0.01	<10	<10	11	10	44		
P2-22	<10	0.15	551	4	0.02	12	530	16	4.11	2	4	29	<0.01	<10	<10	15	<10	64		
P2-23	<10	1.44	2440	18	<0.01	19	40	168	0.52	<2	1	23	<0.01	<10	<10	9	10	399		
P2-24	<10	0.49	868	20	<0.01	20	200	128	1.56	2	1	12	<0.01	<10	<10	10	10	204		
P2-25	<10	0.43	6310	13	<0.01	14	60	185	2.19	3	1	73	<0.01	<10	<10	7	10	796		
P2-26	<10	0.08	495	8	0.01	13	510	96	3.59	2	2	23	<0.01	<10	<10	10	<10	247		
P2-27	<10	0.64	4090	11	<0.01	12	30	188	0.83	2	2	45	<0.01	<10	<10	6	<10	1975		
P2-28	<10	0.2	717	12	0.01	18	380	176	2.97	2	2	18	<0.01	<10	<10	11	<10	558		
P2-29	<10	0.69	3250	16	0.01	20	300	223	0.93	<2	4	33	<0.01	<10	<10	14	10	623		
P2-30	10	0.35	1320	2	0.02	9	730	9	2.28	<2	7	44	<0.01	<10	<10	17	<10	75		
P2-31	<10	0.47	1370	5	0.01	10	480	53	2.23	<2	5	29	<0.01	<10	<10	16	<10	482		
P2-35	<10	1.03	3510	15	<0.01	16	100	463	0.78	<2	1	40	<0.01	<10	<10	12	10	514		
P2-36	<10	0.28	607	4	0.02	13	670	25	2.95	<2	5	29	<0.01	<10	<10	27	<10	74		
P2-37	<10	1.2	5100	9	0.01	12	180	58	1.19	2	2	74	<0.01	<10	<10	10	<10	428		
P2-38	<10	0.22	1430	6	0.01	12	680	28	3.06	<2	3	42	<0.01	<10	<10	11	<10	93		
P2-39	<10	0.1	524	10	0.01	12	760	24	2.91	<2	3	18	<0.01	<10	<10	11	<10	120		
P2-40	10	0.16	1990	7	0.01	7	1000	19	3.66	<2	4	29	<0.01	<10	<10	9	<10	79		
P2-41	10	0.15	1450	4	0.01	7	1060	17	2.87	2	4	27	<0.01	<10	<10	10	10	81		
P2-42	<10	0.52	2430	3	0.02	9	940	18	2.81	<2	4	30	<0.01	<10	<10	16	10	89		
P2-43	<10	0.72	1965	7	0.01	16	660	9	2.56	<2	5	34	<0.01	<10	<10	19	<10	93		
P2-44	<10	0.73	2590	8	0.01	16	500	39	1.87	2	5	35	<0.01	<10	<10	16	<10	196		
P2-45	<10	0.07	469	12	<0.01	19	410	28	3.44	10	1	17	<0.01	<10	<10	8	10	114		
P2-46	<10	0.11	374	9	0.01	18	400	16	2.4	2	2	16	<0.01	<10	<10	9	10	43		
P2-47	<10	0.09	493	13	0.01	21	400	27	3.28	3	2	15	<0.01	<10	<10	10	10	142		
P2-48	<10	0.1	651	7	0.01	18	500	18	2.84	2	3	25	<0.01	<10	<10	10	<10	52		
P2-49	<10	1.14	3850	12	0.01	16	410	210	5.25	18	4	56	<0.01	10	<10	13	<10	258		
P2-56	10	0.36	2580	2	<0.01	10	830	32	3.05	<2	9	46	<0.01	<10	<10	25	<10	326		
P2-57	10	0.19	1315	2	<0.01	7	780	96	1.17	<2	6	38	<0.01	<10	<10	17	<10	620		
P2-58	10	0.68	3240	1	0.02	8	740	4	0.54	<2	12	58	<0.01	<10	<10	32	<10	41		
P2-59	<10	1.51	2450	<1	0.04	9	510	5	0.4	<2	19	75	<0.01	<10	<10	89	<10	40		
P2-60	<10	1.18	1950	<1	0.04	8	540	12	0.7	2	17	87	<0.01	<10	<10	75	<10	43		
P2-61	<10	0.91	1655	1	0.02	11	830	4	1.59	<2	6	34	<0.01	<10	<10	24	<10	70		
P2-62	10	1.15	2060	1	0.03	19	800	2	0.32	<2	15	56	<0.01	<10	<10	49	<10	38		
P2-63	10	0.94	2140	2	0.02	11	840	6	1.84	<2	7	43	<0.01	<10	<10	18	<10	36		
P3-1	<10	0.12	184	5	<0.01	13	580	26	3.31	2	2	12	<0.01	<10	<10	9	<10	53		
P3-2	<10	0.25	543	2	<0.01	11	790	7	0.75	<2	4	15	<0.01	<10	<10	19	<10	61		
P3-3	<10	0.34	1145	2	<0.01	15	750	6	1.52	<2	6	37	<0.01	<10	<10	29	<10	63		
P3-4	<10	0.74	1540	11	0.01	22	470	11	2.53	<2	6	47	<0.01	<10	<10	42	<10	202		
P3-10	<10	0.53	630	2	<0.01	13	900	15	2.12	<2	5	17	<0.01	<10	<10	20	<10	84		
P3-11	10	0.36	1535	<1	0.01	6	850	4	0.56	<2	8	61	<0.01	<10	<10	27	<10	65		
P3-16	10	1.61	1875	6	0.02	4	890	3	0.49	<2	8	67	<0.01	<10	<10	70	<10	61		
P3-17	10	1.3	2120	10	0.01	4	770	7	1.44	<2	6	80	<0.01	<10	<10	52	<10	48		
P3-18	10	1.46	2180	1	0.02	7	620	4	0.31	<2	9	79	<0.01	<10	<10	64	<10	57		
P3-20	10	1.66	1960	26	0.01	6	910	3	0.49	<2	9	70	<0.01	<10	<10	71	<10	65		
P3-21	10	1.23	1695	2	0.01	7	840	5	0.52	<2	6	68	<0.01	<10	<10	59	<10	50		
P3-23	<10	0.27	774	2	<0.01	3	180	77	0.52	<2	1	28	<0.01	<10	<10	8	200	164		
P4-1A	<10	0.51	1240	41	<0.01	20	330	1450	4.58	9	4	25	0.08	<10	<10	27	<10	2550		
P4-2A	<10	0.11	1180	5	<0.01	10	380	45	3.13	2	5	28	<0.01	<10	<10	14	<10	88		
P4-3A	<10	0.12	537	22	<0.01	31	120	1625	5.61	2	2	8	<0.01	<10	<10	16	<10	4340		
P4-4A	10	0.29	1485	3	<0.01	7	450	11	1.92	<2	3	42	0.08	<10	<10	11	<10	25		
P4-5A	<10	0.2	348	9	<0.01	8	550	10	2.15	<2	2	15	0.09	<10	<10	9	<10	22		
P4-6A	<10	0.17	567	90	<0.01	13	420	447	4.5	4	1	13	<0.01	<10	<10	7	<10	672		

Table 4-27 Results of Microscopic Observstion of Thin Sections, Prambon District

Sample No.	Depth (m)	Field name	Rock type	Texture	Phenocryst or fragment							groundmass or matrix							alteration				Description
					MP	cpx	hb	qz	pl	Kf	op	MP	hb	qz	pl	Kf	gl	op	cb	sm/chl	ser	epi	
P1-38T	25.00	Porphyritic andesite	altered andesite	porphyritic	(○)	△	○		◎		△	(○)		△	◎		(◎)	△	◎	○			Mafic minerals and groundmass are altered into carbonate and smectite.
P1-39T	67.95	Fine-grained andesite?	altered andesite	porphyritic	(○)				(◎)		△	(○)		○	(○)		(◎)	○	○	△	◎		Plagioclase is totally replaced by sericite. Mafic minerals by chlorite and carbonate
P1-40T	143.15	Coarse-grained andesite	altered andesite	porphyritic	(○)				◎		○	(○)		○	◎		(○)	○	◎	○			Mafic minerals by smectite and carbonate. Amygdule by carbonate and smecite.
P1-41T	224.70	Andesitic lapilli tuff-tuff breccia	volcanic breccia	clastic to porphyrtic	(○)			○	(◎)		○	(△)		○	(◎)		(○)	○	◎	○	○		Various rock fragments. Plagioclase totally by sericite. Mafic by smectite and cb.
P2-34T	155.50	Coarse-grained andesite	altered andesite	porphyritic	(○)				◎		△	(△)			◎		(○)	○	○	◎	○		Mafic by smectite and cb. Plagioclase strongly by sericite and cb.
P2-50T	168.25	Coarse-grained andesite	altered andesite	porphyritic	(○)				(◎)		△	(△)		△	(◎)		(○)	○		◎	○		Mafic minerals by carbonate. Plagioclase by carbonate and sericite.
P2-51T	236.00	Lapilli tuff (hyaloclastite?)	lappile tuff	clastic to porphyrtic	(○)			○	◎		△			○	◎		(○)	○	◎	◎	○		Mafic by carbonate and chlorite. Plagioclase by carbonate and sericite.
P2-52T	196.30	Compact andesite	altered andesite	porphyritic	(○)				◎		○	(○)			◎		(○)	○	◎	○			Mafic by smectite and carbonate. Plagioclase locally by carbonate.
P3-6T	43.60	Altered andesite	altered andesite	porphyritic	(○)				(◎)		△	(○)		○	(◎)		(○)	○	◎		◎		Mafic by carbonate. Plagioclase totally by sericite.
P3-7T	44.60	Andesitic lapilli tuff-tuff breccia	altered andesite	porphyritic	(○)				(◎)		○	(○)		○	(◎)		(○)	○	◎	○	○		Mafic by carbonate and chlorite. Plagioclase by sericite and carbonate.
P3-19T	135.00	Andesitie(lava?)	altered andesite	trachtic	(○)				○		○	(○)		○	◎		(○)	○	○	◎	△		Mafic by smecite and carbonate. Amygdule by smectite and carbonate.
P3-22T	206.80	Andesitie(lava?)	altered andesite	porphyritic	(○)				(◎)		○	(○)		△	(◎)		(○)	○	◎	○	○		Mafic by chlorite and carbonate. Plagioclase totally by sericite and carbonate.
P4-19T	44.30	Fine-grained andesite	altered andesite	porphyritic	(△)				(◎)		○	(△)		○	(○)		(○)	○	◎	○	○		Mafic by chlorite and quartz. Plagioclase phenocryst totally by carbonate.
P4-20T	129.95	Coarse-grained andesite	altered andesite	porphyritic	(○)				(◎)		○	(○)			◎		(○)	○	○	○		△	Plagioclase strongly by carbonate and epidote. Mafic by chlorite or carbonate.
P4-21T	182.10	Coarse-grained andesite	volcanic breccia	clastic to porphyrtic	(○)				(◎)		○	(○)			◎		(○)	○	◎	○	△		Mafic by carbonate and chlorite. Plagioclase strongly by carbonate, locally by sericite.
P4-22T	227.00	Fine-grained andesite	altered andesite	porphyritic	(○)				(◎)		○	(○)		○	(◎)		(○)	○	○	◎		○	Mafic by carboante and epidote. plagioclase totally by carbonate.

abbrev. MP=pseudomorph of mafic minerals, cpx=clinopyroxene, pl=plagioclase, op=opaque minerals, qz=quartz, hb=hornblende
gl=glass or microcrystalline aggregate, cb.=carbonate, ser=sericite, Kf=K-feldspar, epi=epidote, sm/chl=smectite or chlorite
◎abundant, ○common, △small, •rare

Table 4-28 Results of X-ray Diffraction Analysis, Prambon District

Drill Hole	Sample No	Depth (m)	Quartz Index										Remarks
			Qtz	Kf	Pl	Chl	Se	Cal	Sid	Kut	Py	Cpx	
MJIE-P1	P1-13	52.70～53.05	59			6	15		26		39		
	P1-23	88.0～88.2	79				13				48		
	P1-24	88.80～89.40	108				10				21		
	P1-25	164.5～165.23	49			14	15	109	26		22		
	P1-27	165.55～166.25	22			24	10	259					
	P1-30	44.80	83			18	12		19		19		
	P1-31	66.45	57			17	13				23		
	P1-32	96.00	30			33	8	94					
	P1-33	132.50	22			29	15	137			4		
	P1-34	164.60	40			14	16	99	19		10		
	P1-35	191.30	18			37	13	96		14	11		
	P1-36	220.60	31			48	11	102		13			
	P1-37	249.00	59			45	13	37					Se: Sericite/smectite mixed layer mineral?
	P1-46	117.30	47			7	12	184			15		Se: Sericite/smectite mixed layer mineral?
MJIE-P2	P2- 1	84.50	22				6			130	14		Se: Sericite/smectite mixed layer mineral?
	P2- 8	97.15～97.80	123				9			34	5		
	P2- 9	98.80	72				13	60					
	P2- 14	168.70～169.10	37				18	54			14		
	P2- 17	177.00～178.30	32				11	325	16	12	10		
	P2- 32	186.80	28				13	64	45	10			
	P2- 33	157.30	26		52	23	8	75			4		
	P2- 44	245.70～246.90	44			4	16	99	13	20	2		
	P2- 49	250.20～250.63	37			6	13	23	12	72	17		
	P2- 51	236.00	24		149	26	8	47	16	45			
	P2- 53	214.00	38		22		9						
	P2- 54	240.00	7		59	28	8	49	13	80			Se: Sericite/smectite mixed layer mineral?
	P2- 55	252.50	41			6	6	89					
MJIE-P3	P3-3	42.47～43.20	65				25	10					Se: Sericite/smectite mixed layer mineral?
	P3-5	10.00	39		45	25	7	94					Se: Sericite/smectite mixed layer mineral?
	P3-6	43.60	26			21	5	102					Se: Sericite/smectite mixed layer mineral?
	P3-7	44.60	24		44	13	6	88					
	P3-8	31.70	66		46	33	6	88					
	P3-9	23.00	62			14	9	12	19	6			Se: Sericite/smectite mixed layer mineral?
	P3-12	100.20	17		145	21		36				34	Cpx: Diopside?
	P3-13	150.20	42		208	24		16					
	P3-14	199.00	25		56	34		260					
	P3-15	249.70	11		334	34	7	72					
	P3-16	172.90～173.35	12		121	55	5	46					
	P3-17	174.20～174.50	33		15	22	9	142			Tr		Se: Sericite/smectite mixed layer mineral?
MJIE-P4	P4-7	44.30	30		163	37	9	82			Tr		
	P4-8	73.00	22	26	35	25	Tr	59				16	Cpx: Diopside?
	P4-9	100.00	50		115	8							
	P4-10	129.95	8		102	26		47					
	P4-11	157.85	35		58	19	Tr	474				25	Cpx: Diopside?
	P4-12	190.45	27		69	24	4	104					
	P4-13	220.50	32		88	37	50	55					
	P4-14	241.80	89			24	19	11					
	P4-15	135.95	59			7	8	73			38		
	P4-16	156.25	66			5	18	35			16		
	P4-17	240.60	85			6	19	11			14		

Qtz:Quartz, Kf: K-felfspar, Pl: Plagioclase, Chl: Chlorite, Se: Sericite, Cal: Calcite, Sid: Siderite, Kut:Kutnahorite, Py: Pyrite, Cpx: Clino-pyroxene

Table 4-29 Results of Microscopic Observation of Polished Sections, Prambon District

Sample No.	Depth (m)	Description	Ore minerals					Gangue minerals									
			Py	Cp	Sph	Asp	Aca	Gn	others	si	ser	pl	kf	chl	epi	cal	others
P1-9P	46.90～47.40	Pyrite disseminated silcified zone	◎		・			・		◎	△						Ti(・)
P1-13P	52.70～53.05	Pyrite disseminated silcified zone	◎				・	・		◎							ank(◎)
P1-47P	88.05	Pyrite disseminated silcified zone	◎		・			・		◎	○						
P1-15P	70.85～71.35	Pyrite veinlets-disseminated silcified zone	○						Pyr(・)Goe(△)	◎	△						cab(◎)
P1-22P	87.0～88.0	Pyrite disseminated silcified zone	◎					・		◎	・						Ti(・)
P2-3P	94.85～95.23	Pyrite disseminated argillic zone	○		△			・		◎	○						Ti(・)
P2-6P	95.95～96.65	Pyrite veinlets-disseminated silcified ore	○		・			△		◎	○						
P2-25P	183.17～183.80	Pyrite veinlets-disseminated silcified ore	○	・	・		・	○		◎	○					△	ank(△)
P2-28P	185.00～186.00	Pyrite disseminated silcified-argillic ore	○		○			△		◎						◎	
P2-35P	198.35～199.20	Pyrite veinlets-disseminated quartz-calcite vein	○	△	○			△		○				△		◎	ank(○)
P2-49P	250.20～250.63	Pyrite disseminated silcified ore	◎		△			△		◎						○	dol(△)
P3-4P	42.20～43.55	Pyrite disseminated argillic zone	○			・		・	Ber(・)	◎						○	
P4-1P	135.8～136.07	Pyrite veinlets, argillic-silcified zone	◎		○			△		◎	○			△			
P4-3P	156.65	Pyrite disseminated quartz vein	◎		・			・		◎						△	
P4-23P	156.70	Pyrite disseminated quartz vein	◎	・	○			△		◎	△						
P4-5P	240.47～241.10	Quartz -calcite vein with pyrite veinlets	○	△						◎	○					○	epi(○)

\bbreviation:
pyrite, Gn=galena, Goe=goethite, Aca=acanthite,
er=berthierite, Pyr=pyrrhotite

' minerals, epi=epidote, cal=calcite, ank=ankerite
e, Ti=TiO2 polymorph, ank=ankerite,

'=common, △=small, ・=rare

Table 4-30 Results of Fluid Inclusion Study of Drill Core Samples, Prambon District (1/3)

Specimen	Mineral	Size (μm)	primary or secondary	form	Phasee	Salinity (wt%.NaCl)	Th(℃)
P1-9Fa-1	quartz	10	secondary	irregular	liquid dominant two phase	0.7	228
P1-9Fa-2	quartz	13	secondary	ellipsoidal	liquid dominant two phases	1.5	193
	quartz	12	secondary	ellipsoidal	liquid dominant two phases	1.1	193
P1-9Fa-3	quartz	6	secondary	shperical	liquid dominant two phases	1.5	201
	quartz	5	secondary	ellipsoidal	liquid dominant two phases	1.3	193
P1-9Fa-4	quartz	6	secondary	ellipsoidal	liquid dominant two phases		236
	quartz	10	secondary	ellipsoidal	liquid dominant two phases		215
	quartz	5	secondary	ellipsoidal	liquid dominant two phases		217
P1-9Fa-5	quartz	15	secondary	irregular	liquid dominant two phases		240
P1-9Fb-1	quartz	13	secondary	ellipsoidal	liquid dominant two phases	0.9	207
	quartz	9	secondary	irregular	liquid dominant two phases	0.9	244
P1-9Fb-2	quartz	7	secondary	irregular	liquid dominant two phases	0.9	159
P1-9Fc-1	quartz	20	secondary	irregular	liquid dominant two phases	0.7	155
P1-9Fc-2	quartz	16	secondary	irregular	liquid dominant two phases	0.9	169
P1-9Fd-1	quartz	7	secondary	irregular	liquid dominant two phases	4.5	251
P1-9Fd-2	quartz	10	secondary	ellipsoidal	liquid dominant two phases	4.3	unmeasurable
P1-9Fd-3	quartz	7	secondary	shperical	liquid dominant two phases	4.5	198
	quartz	6	secondary	shperical	liquid dominant two phases	3.5	204
P1-9Fe-1	quartz	10	secondary	ellipsoidal	liquid dominant two phases		202
	quartz	27	secondary	irregular	liquid dominant two phases		204
P1-9Ff-1	calcite	14	secondary	irregular	liquid dominant two phases		230
P1-9Ff-2	quartz	5	secondary	angular	liquid dominant two phases		202

No.2

P1-14Fa-1	quartz	7	secondary	idiomorphy	liquid dominant two phases	2.5	244
P1-14Fa-2	quartz	7	secondary	idiomorphy	liquid dominant two phases	1.5	245
P1-14Fa-3	quartz	6	secondary	ellipsoidal	liquid dominant two phases	1.6	unmeasurable
P1-14Fb-1	quartz	18	secondary	irregular	liquid dominant two phases	1.3	178
	quartz	7	secondary	idiomorphic	liquid dominant two phases	1.5	184
	quartz	7	secondary	irregular	liquid dominant two phases	1.5	178
P1-14Fb-2	quartz	5	secondary	angular	liquid dominant two phases	1.5	148
	quartz	5	secondary	angular	liquid dominant two phases	1.6	148
	quartz	20	secondary	irregular	liquid dominant two phases	1.6	154
	quartz	6	secondary	ellipsoidal	liquid dominant two phases	1.6	147
P1-14Fb-3	quartz	8	secondary	ellipsoidal	liquid dominant two phases		244
	quartz	8	secondary	irregular	liquid dominant two phases		201
	quartz	3	secondary	irregular	liquid dominant two phases		220
P1-14Fc-1	quartz	8	secondary	ellipsoidal	liquid dominant two phases	2.0	unmeasurable
P1-14Fd-1	quartz	5	secondary	ellipsoidal	liquid dominant two phases		188
	quartz	5	secondary	ellipsoidal	liquid dominant two phases		218
	quartz	4	secondary	shperical	liquid dominant two phases		217
P1-14Fd-2	quartz	14	secondary	irregular	liquid dominant two phases		230
	quartz	6	secondary	ellipsoidal	liquid dominant two phases		208
P1-14Fd-3	quartz	5	secondary	idiomorphic	liquid dominant two phases		230
	quartz	5	secondary	ellipsoidal	liquid dominant two phases		184
P1-14Fd-4	quartz	8	secondary	idiomorphic	liquid dominant two phases		251

No.4

	host mineral	size(μm)	primary or secondary	form	Phasee	salinty(wt%.NaCl)	Th(℃)
P2-25Fa-1	quartz	10	secondary	angular	liquid dominant two phases	1.6	225
P2-25Fa-2	quartz	20	secondary	irregular	liquid dominant two phases	1.8	206
P2-25Fa-3	quartz	17	secondary	irregular	liquid dominant two phases		218
	quartz	7	secondary	irregular	liquid dominant two phases		225
	quartz	9	secondary	irregular	liquid dominant two phases		180
P2-25Fb-1	quartz	5	secondary	ellipsoidal	liquid dominant two phases	2.3	181
	quartz	5	secondary	ellipsoidal	liquid dominant two phases	2.3	187
P2-25Fb-2	quartz	7	secondary	ellipsoidal	liquid dominant two phases		178
P2-25Fc-2	quartz	7	secondary	ellipsoidal	liquid dominant two phases	0.9	178
P2-25Fc-3	quartz	17	secondary	irregular	liquid dominant two phases	0.6	243
	quartz	13	secondary	irregular	liquid dominant two phases	0.9	246
	quartz	10	secondary	irregular	liquid dominant two phases	0.7	248
P2-25Fc-4	quartz	13	secondary	irregular	liquid dominant two phases		218
	quartz	20	secondary	irregular	liquid dominant two phases		240
P2-25Fc-5	quartz	5	secondary	irregular	liquid dominant two phases		231
	quartz	11	secondary	irregular	liquid dominant two phases		199
P2-25Fd-1	quartz	10	secondary	ellipsoidal	liquid dominant two phases	1.5	205
P2-25Fe-1	quartz	10	secondary	irregular	liquid dominant two phases	4.5	183
	quartz	5	secondary	idiomorphic	liquid dominant two phases		134
P2-25Fg-1	quartz	4	secondary	idiomorphic	liquid dominant two phases	3.7	unmeasurable
	quartz	3	secondary	ellipsoidal	liquid dominant two phases	3.0	unmeasurable
	quartz	7	secondary	ellipsoidal	liquid dominant two phases	3.0	unmeasurable
P2-25Fh-1	quartz	6	secondary	idiomorphic	liquid dominant two phases		163
	quartz	4	secondary	shperical	liquid dominant two phases		163
P2-25Fi-1	quartz	7	secondary	irregular	liquid dominant two phases		243

Table 4-30 Results of Fluid Inclusion Study of Drill Core Samples, Prambon District (2/3)

No.5

	host mineral	size(μm)	primary or secondary	form	Phasee	salinty(wt%.NaCl)	Th(℃)
P2-35Fa-1-1	quartz	10	secondary	idiomorphic	liquid dominant two phases	4.3	228
	quartz	7	secondary	irregular	liquid dominant two phases	4.5	unmeasurable
P2-35Fa-1-2	quartz	10	secondary	irregular	liquid dominant two phases		253
P2-35Fa-1-3	quartz	6	secondary	idiomorphic	liquid dominant two phases		169
	quartz	10	secondary	irregular	liquid dominant two phases		192
	quartz	7	secondary	irregular	liquid dominant two phases		187
	quartz	7	secondary	idiomorphic	liquid dominant two phases		172
P2-35Fa-1-4	quartz	10	secondary	ellipsoidal	liquid dominant two phases		211
P2-35Fa-1-5	quartz	10	secondary	idiomorphic	liquid dominant two phases		191
P2-35Fa-2	quartz	7	secondary	irregular	liquid dominant two phases	1.8	161
	quartz	7	secondary	idiomorphic	liquid dominant two phases	2.7	unmeasurable
	quartz	10	secondary	irregular	liquid dominant two phases	1.8	275
P2-35Fb-1	quartz	8	secondary	idiomorphic	liquid dominant two phases	2.0	171
P2-35Fb-2	quartz	14	secondary	irregular	liquid dominant two phases		248
P2-35Fb-3	quartz	4	secondary	ellipsoidal	liquid dominant two phases		181
	quartz	4	secondary	ellipsoidal	liquid dominant two phases		205
P2-35Fe-1	quartz	50	secondary	irregular	liquid dominant two phases	0.4	unmeasurable
P2-35Fe-2	quartz	25	secondary	irregular	liquid dominant two phases	0.2	unmeasurable
P2-35Fg-1	quartz	6	secondary	shperical	liquid dominant two phases	0.9	228
P2-35Fh-1	quartz	10	secondary	irregular	liquid dominant two phases	2.3	unmeasurable
P2-35Fh-2	quartz	30	secondary	irregular	liquid dominant two phases	3.2	188
	quartz	8	secondary	irregular	liquid dominant two phases		153
	quartz	8	secondary	ellipsoidal	liquid dominant two phases	3.2	170
P2-35Fh-3	quartz	9	secondary	irregular	liquid dominant two phases		199
P2-35Fi-1	quartz	7	secondary	irregular	liquid dominant two phases		132

No.6

	host mineral	size(μm)	primary or secondary	form	Phasee	salinty(wt%.NaCl)	Th(℃)
P2-46F 1-2	quartz	8	secondary	irregular	liquid dominant two phases	1.8	226
P2-46F 1-3	quartz	7	secondary	irregular	liquid dominant two phases	1.8	221
P2-46F 1-4	quartz	9	secondary	irregular	liquid dominant two phases	0.9	214
P2-46F 2-1	quartz	10	secondary	irregular	liquid dominant two phases	0.7	202
P2-46F 2-2	quartz	10	secondary	idiomorphic	liquid dominant two phases	0.9	198
P2-46F 2-3	quartz	8	secondary	irregular	liquid dominant two phases	0.6	177
P2-46F 2-4	quartz	9	secondary	irregular	liquid dominant two phases	0.6	167
P2-46F 3-1	quartz	9	secondary	irregular	liquid dominant two phases	0.9	unmeasurable
P2-46F 3-2	quartz	13	secondary	irregular	liquid dominant two phases	0.6	unmeasurable
P2-46F 4-1-1	quartz	4	secondary	irregular	liquid dominant two phases	1.8	221
P2-46F 4-1-2	quartz	10	secondary	irregular	liquid dominant two phases	0.7	251
P2-46F 4-1-3	quartz	7	secondary	irregular	liquid dominant two phases	0.6	212
P2-46F 4-1-4	quartz	8	secondary	irregular	liquid dominant two phases	1.6	172
P2-46F 4-2-1	quartz	10	secondary	irregular	liquid dominant two phases	3.7	220
P2-46F 4-2-2	quartz	7	secondary	irregular	liquid dominant two phases	3.8	200
P2-46F 4-2-3	quartz	4	secondary	irregular	liquid dominant two phases	3.7	199
P2-46F 4-2-4	quartz	3	secondary	irregular	liquid dominant two phases	4.0	167
P2-46F 5-1	quartz	5	secondary	irregular	liquid dominant two phases	0.9	224
P2-46F 5-2-1	quartz	7	secondary	irregular	liquid dominant two phases	0.9	208
P2-46F 5-2-2	quartz	7	secondary	irregular	liquid dominant two phases	1.1	209
P2-46F 6-1	quartz	13	secondary	irregular	liquid dominant two phases	0.6	221

No.8

Specimen	Mineral	Size (μm)	primary or secondary	form	Phasee	Salinity (wt%.NaCl)	Th(℃)
P4-1F 2-1-1	calcite	13	secondary	irregular	liquid dominant two phases	0.2	256
P4-1F 2-1-2	calcite	5	secondary	irregular	liquid dominant two phases	0.4	263
P4-1F 2-1-3	calcite	4	secondary	ellipsoidal	liquid dominant two phases	0.4	249
P4-1F 2-1-4	calcite	8	secondary	irregular	liquid dominant two phases	0.4	unmeasurable
P4-1F 2-1-5	calcite	5	secondary	irregular	liquid dominant two phases	0.2	248
P4-1F 3-1-1	calcite	18	secondary	irregular	liquid dominant two phases	2.0	312
P4-1F 3-1-2	calcite	6	secondary	irregular	liquid dominant two phases	3.3	242
P4-1F 3-2-1	calcite	9	secondary	irregular	liquid dominant two phases	2.0	339
P4-1F 3-2-2	calcite	4	secondary	irregular	liquid dominant two phases	2.1	335
P4-1F 3-2-3	calcite	3	secondary	irregular	liquid dominant two phases	2.0	294
P4-1F 5-1	calcite	15	secondary	irregular	liquid dominant two phases	1.6	328
P4-1F 5-2-1	calcite	10	secondary	irregular	liquid dominant two phases		288
P4-1F 5-2-2	calcite	12	secondary	irregular	liquid dominant two phases		335
P4-1F 5-2-3	calcite	11	secondary	ellipsoidal	liquid dominant two phases		334
P4-1F 5-2-4	calcite	11	secondary	irregular	liquid dominant two phases		327
P4-1F 8-1-1	calcite	17	secondary	irregular	liquid dominant two phases	2.1	339
P4-1F 8-1-2	calcite	8	secondary	irregular	liquid dominant two phases	2.3	318
P4-1F 8-2-1	calcite	15	secondary	idiomorphic	liquid dominant two phases	2.1	unmeasurable
P4-1F 8-2-2	calcite	8	secondary	irregular	liquid dominant two phases	0.7	276
P4-1F 8-3-1	calcite	22	secondary	irregular	liquid dominant two phases	2.0	306
P4-1F 8-3-2	calcite	7	secondary	irregular	liquid dominant two phases	2.8	276
P4-1F 9-1-1	calcite	26	secondary	irregular	liquid dominant two phases	2.0	348
P4-1F 9-1-2	calcite	8	secondary	irregular	liquid dominant two phases	1.8	348
P4-1F 9-2-1	calcite	6	secondary	irregular	liquid dominant two phases	3.0	303
P4-1F 9-2-2	calcite	4	secondary	irregular	liquid dominant two phases	1.8	344

Table 4-30 Results of Fluid Inclusion Study of Drill Core Samples, Prambon District (3/3)

No.9

Specimen	Mineral	Size (μm)	primary or secondary	form	Phasee	Salinity (wt%.NaCl)	Th(℃)
P4-3F 2-1-1	quartz	15	secondary	irregular	liquid dominant two phases	0.6	293
P4-3F 2-1-2	quartz	10	secondary	irregular	liquid dominant two phases	0.7	293
P4-3F 2-1-3	quartz	8	secondary	irregular	liquid dominant two phases	0.7	291
P4-3F 2-1-4	quartz	11	secondary	irregular	liquid dominant two phases	0.6	284
P4-3F 2-2-1	quartz	11	secondary	irregular	liquid dominant two phases	0.7	306
P4-3F 2-2-2	quartz	6	secondary	irregular	liquid dominant two phases	0.6	277
P4-3F 3-1-1	quartz	18	secondary	irregular	liquid dominant two phases	0.9	272
P4-3F 3-1-2	quartz	10	secondary	irregular	liquid dominant two phases	1.1	282
P4-3F 3-3-1	quartz	10	secondary	irregular	liquid dominant two phases		298
P4-3F 3-3-2	quartz	10	secondary	irregular	liquid dominant two phases	0.9	275
P4-3F 3-3-3	quartz	8	secondary	irregular	liquid dominant two phases	0.9	284
P4-3F 3-4-1	quartz	18	secondary	irregular	liquid dominant two phases	0.7	281
P4-3F 3-4-2	quartz	8	secondary	irregular	liquid dominant two phases	0.7	286
P4-3F 4-1	quartz	8	secondary	irregular	liquid dominant two phases	0.6	275
P4-3F 4-2	quartz	14	secondary	irregular	liquid dominant two phases	0.6	287
P4-3F 5-1-1	quartz	10	secondary	irregular	liquid dominant two phases	0.7	248
P4-3F 5-1-2	quartz	6	secondary	irregular	liquid dominant two phases	1.3	254
P4-3F 5-3	quartz	10	secondary	irregular	liquid dominant two phases	1.3	254
P4-3F 6-1-1	quartz	7	secondary	irregular	liquid dominant two phases	1.8	257
P4-3F 6-1-2	quartz	10	secondary	irregular	liquid dominant two phases	2.0	268
P4-3F 6-2-1	quartz	12	secondary	idiomorphic	liquid dominant two phases	0.9	255
P4-3F 6-2-2	quartz	15	secondary	irregular	liquid dominant two phases	0.9	268
P4-3F 6-2-3	quartz	12	secondary	irregular	liquid dominant two phases	0.9	263

No.10

Specimen	Mineral	Size (μm)	primary or secondary	form	Phasee	Salinity (wt%.NaCl)	Th(℃)
P4-5F 1-1	quartz	10	secondary	irregular	liquid dominant two phases	2.1	unmeasurable
P4-5F 1-2	quartz	4	secondary	irregular	liquid dominant two phases	2.3	288
P4-5F 2	calcite	7	secondary	irregular	liquid dominant two phases	1.8	283
P4-5F 3-1	calcite	8	secondary	irregular	liquid dominant two phases	0.4	374
P4-5F 3-2-1	calcite	10	secondary	irregular	liquid dominant two phases	0.4	unmeasurable
P4-5F 3-2-2	calcite	12	secondary	irregular	liquid dominant two phases	0.6	unmeasurable
P4-5F 3-3-1	calcite	7	secondary	ellipsoidal	liquid dominant two phases	0.4	unmeasurable
P4-5F 3-3-2	calcite	7	secondary	irregular	liquid dominant two phases	0.4	unmeasurable
P4-5F 3-5-1	calcite	7	secondary	ellipsoidal	liquid dominant two phases	0.6	386
P4-5F 3-5-2	calcite	5	secondary	ellipsoidal	liquid dominant two phases	0.6	288
P4-5F 3-6-1	calcite	6	secondary	irregular	liquid dominant two phases	0.7	245
P4-5F 3-6-2	calcite	12	secondary	irregular	liquid dominant two phases	0.6	278
P4-5F 3-6-3	calcite	4	secondary	ellipsoidal	liquid dominant two phases	0.4	284
P4-5F 3-6-4	calcite	4	secondary	irregular	liquid dominant two phases	0.4	284

Two samples (P2-4F,P3-4F) do not contain fluid inclusions that can be measurable.

Table 4-30 Fluid Inclusion Study of Drill Core Samples, Prambon District (4/4)

Inclusion number	mineral	Size(um)	ary or Secor	Form	Phases	Th(℃)	first ice melting temperature(oC)	Final melting temperature (oC)	Major components	Salinity		Remarks
P1-22 1-1-1	quartz	24	primary	idiomorphic	liquid dominant	unmeasurerale due to decrepitation	-21.4	-9.8	H2O-NaClsystem	14.6	wt % NaCl eq	
P1-22 1-1-2	quartz	6	primary	idiomorphic	liquid dominant	unmeasurerale due to decrepitation		-10.8	H2O-NaClsystem	15.7	wt % NaCl eq	
P1-22 1-2	quartz	12	primary ?	idiomorphic	liquid dominant	unmeasurerale due to decrepitation	-21.9	-7.4	H2O-NaClsystem	11.6	wt % NaCl eq	
P1-22 1-3	quartz	25	primary ?	idiomorphic	liquid dominant	292		-2.7	H2O-NaClsystem	4.8	wt % NaCl eq	
P1-22 2-1	quartz	25	primary ?	idiomorphic	liquid dominant	281		-8.4	H2O-NaClsystem	13.0	wt % NaCl eq	
P1-22 2-2	quartz	19	secondary	不規則	liquid dominant	unmeasurerale due to gas disappear	-20.6	-0.2	H2O-NaClsystem	0.4	wt % NaCl eq	
P1-22 2-3-1	quartz	12	primary	idiomorphic	liquid dominant	221	< -80℃	unfleased				
P1-22 2-3-2	quartz	10	primary	idiomorphic	liquid dominant	225	< -80℃	unfleased				
P1-22 3-1	quartz	13	primary ?	idiomorphic	liquid dominant	220	-34.1	-19.7	H2O-NaCl-CaCl2system ?	21.2	wt % $CaCl_2$ eq	Estimated from final ice melting temperature and H2O-NaCl-CaCl2system
P1-22 4-1	quartz	27	primary ?	idiomorphic	liquid dominant	261		-24.3	H2O-NaCl-CaCl2system ?	23.3	wt % $CaCl_2$ eq	Estimated from final ice melting temperature and H2O-NaCl-CaCl2system
P1-22 4-2	quartz	30	primary ?	idiomorphic	liquid dominant	Decrepted at 300℃	-54.3	-17.3	H2O-NaCl-CaCl2system ?	19.5	wt % $CaCl_2$ eq	Estimated from final ice melting temperature and H2O-NaCl-CaCl2system
P1-22 4-3	quartz	45	primary	idiomorphic	liquid dominant	378	-20.6	-3.9	H2O-NaClsystem	6.7	wt % NaCl eq	
P1-22 4-4	quartz	20	primary	idiomorphic	liquid dominant	316	-44.2	-21.3	H2O-NaCl-CaCl2system ?	21.9	wt % $CaCl_2$ eq	Estimated from final ice melting temperature and H2O-NaCl-CaCl2system
P1-22 4-5	quartz	20	primary ?	idiomorphic	liquid dominant	unmeasurerale due to decrepitation	-33.8	-18.5	H2O-NaCl-CaCl2system ?	20.6	wt % $CaCl_2$ eq	Estimated from final ice melting temperature and H2O-NaCl-CaCl2system
P1-22 5-1	quartz	13	primary ?	idiomorphic	liquid dominant	268	<-80℃	unfleased				
P1-22 5-2	quartz	13	primary ?	idiomorphic	liquid dominant	236	< -80℃	unfleased				
P1-22 5-3	quartz	37	primary ?	idiomorphic	liquid dominant	331	-21.3	-2.4	H2O-NaClsystem	4.3	wt % NaCl eq	
P1-22 5-4	quartz	17	primary ?	idiomorphic	liquid dominant	283	-41.5	-19.8	H2O-NaCl-CaCl2system ?	21.0	wt % $CaCl_2$ eq	Estimated from final ice melting temperature and H2O-NaCl-CaCl2system

Table 4-31 Chemical Analysis Results of Drill Hole Core Samples of MJIE-S1

Width(m)	Field Observation	Description		Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr	Ti	Tl	U	V	W	Zn
				ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm
1.00		oxidized zone	FeOx,kaoline	0.002	<0.2	0.42	9	<10	40	<0.5	2	0.01	<0.5	<1	46	4	0.95	<10	<1	0.09	<10	0.01	8	1	<0.01	2	40	5	0.14	<2	1	26	<0.01	<10	<10	5	<10	2
1.00		oxidized zone	FeOx,kaoline	0.002	<0.2	0.43	23	<10	30	<0.5	2	0.01	<0.5	1	134	5	1.38	<10	<1	0.12	<10	0.01	14	4	0.01	5	40	5	0.22	<2	1	23	<0.01	<10	<10	5	<10	3
1.00	oxidezed zone	oxidized zone	FeOx,kaoline	0.001	<0.2	0.57	13	<10	60	<0.5	2	0.01	<0.5	1	217	5	1.36	<10	<1	0.17	<10	<0.01	21	8	0.01	9	30	7	0.32	<2	1	26	<0.01	<10	<10	7	10	2
1.05		oxidized zone	FeOx,kaoline	0.003	<0.2	0.45	20	<10	60	<0.5	<2	0.01	<0.5	1	196	6	1.38	<10	<1	0.09	<10	<0.01	19	8	0.02	8	100	4	0.21	<2	1	59	<0.01	<10	<10	7	10	2
1.00		oxidized zone	FeOx,kaoline	0.007	<0.2	0.42	38	<10	70	<0.5	<2	0.01	<0.5	1	264	9	2.21	<10	<1	0.09	<10	<0.01	29	12	0.04	11	150	2	0.29	2	1	81	<0.01	<10	<10	11	10	5
1.00		pyrite disseminated	soft clay	0.005	<0.2	0.22	80	<10	10	<0.5	2	0.05	0.8	30	35	66	6.37	<10	1	0.1	<10	0.02	20	2	0.01	48	20	12	6.82	<2	5	7	<0.01	<10	<10	10	<10	180
1.00		pyrite disseminated	rather hard	0.006	0.2	0.25	83	<10	30	<0.5	5	0.01	<0.5	40	105	102	6.65	<10	<1	0.03	<10	<0.01	43	2	0.02	168	50	8	7.08	<2	1	41	<0.01	<10	<10	9	<10	16
1.00		pyrite disseminated	rather hard	0.011	0.3	0.42	118	<10	40	<0.5	4	0.01	2.3	57	64	47	6.63	<10	<1	0.02	<10	0.01	30	1	0.01	220	40	11	7.14	<2	1	40	<0.01	<10	<10	6	<10	18
1.00		pyrite disseminated	rather hard +0.20m caly	0.007	0.5	0.21	158	<10	20	<0.5	9	0.02	<0.5	57	76	69	8.44	<10	<1	<0.01	<10	0.01	31	1	0.01	270	20	20	9.06	<2	2	19	<0.01	<10	<10	9	<10	26
1.00		pyrite disseminated	rather soft	0.004	0.3	0.69	74	<10	20	<0.5	<2	0.14	<0.5	27	31	63	5.13	<10	<1	0.08	<10	0.06	26	1	0.02	55	20	22	5.56	<2	10	11	<0.01	<10	<10	35	<10	44
1.00		pyrite disseminated	clay	0.002	<0.2	1.3	52	<10	30	<0.5	3	0.26	1	29	90	78	4.57	<10	<1	0.1	<10	0.45	132	1	0.03	48	10	19	4.92	<2	9	18	<0.01	<10	<10	66	<10	162
1.00		pyrite disseminated	clay	0.004	0.2	0.21	81	<10	10	<0.5	5	0.06	0.9	38	39	84	6.88	<10	<1	0.04	<10	0.02	23	1	0.03	122	10	6	7.37	2	7	10	<0.01	<10	<10	10	<10	231
1.00		pyrite disseminated	clay	0.007	<0.2	0.81	106	<10	10	<0.5	3	0.08	<0.5	40	58	61	6.73	<10	<1	0.08	<10	0.07	48	<1	0.02	126	10	11	7.26	<2	8	7	<0.01	<10	<10	35	<10	319
1.00		pyrite disseminated	rather soft	0.008	0.2	1.76	129	<10	40	<0.5	<2	0.08	1	31	47	27	7.05	10	1	0.07	<10	0.03	54	<1	0.05	82	70	31	7.7	2	15	26	<0.01	<10	<10	47	<10	762
1.00		pyrite disseminated	clay	0.008	<0.2	0.85	134	<10	20	<0.5	2	0.08	0.8	47	81	53	7.37	<10	<1	0.05	<10	0.24	55	<1	0.02	166	20	38	8.01	<2	11	9	<0.01	<10	<10	54	<10	421
1.00		pyrite disseminated	rather soft	<0.001	<0.2	0.68	55	<10	10	<0.5	2	0.11	<0.5	41	65	44	7.73	<10	1	0.11	<10	0.15	29	<1	0.04	133	20	38	8.37	2	9	10	<0.01	<10	<10	29	<10	176
1.00	37.30-167.55: argillic	pyrite disseminated	rather soft	0.001	0.2	3.82	87	<10	10	0.6	3	0.23	<0.5	48	168	108	7.81	10	<1	0.14	<10	2.31	251	<1	0.07	154	40	23	8.68	<2	18	19	<0.01	<10	<10	154	<10	209
1.00		pyrite disseminated	rather hard+ 0.40m clay	0.001	<0.2	5.73	85	<10	20	0.5	<2	0.58	<0.5	33	191	76	6.8	10	1	0.16	<10	5.32	1345	<1	0.05	104	790	15	6.06	<2	17	35	<0.01	<10	<10	166	<10	108
1.00		pyrite disseminated		<0.001	<0.2	4.54	86	<10	20	<0.5	2	0.73	<0.5	36	205	21	6.23	10	1	0.11	<10	4.94	1480	<1	0.04	120	790	12	5.5	<2	16	44	<0.01	<10	<10	171	<10	114
1.00		pyrite disseminated	Fine tuff	<0.001	<0.2	2.9	72	<10	20	<0.5	<2	0.58	<0.5	21	32	38	6.16	10	1	0.1	<10	3.11	894	<1	0.04	14	1100	11	6.04	<2	10	31	0.01	<10	<10	128	<10	98
1.25		pyrite disseminated	soft clay	0.005	0.4	0.93	99	<10	20	<0.5	3	0.21	2.4	45	50	71	7.5	<10	<1	0.16	<10	0.17	49	<1	0.02	143	30	14	8.15	<2	12	20	<0.01	<10	<10	60	<10	425
1.00		pyrite disseminated	pyrite veinlets	0.005	0.2	1.3	85	<10	10	<0.5	4	0.25	0.5	41	60	49	7.57	<10	<1	0.12	<10	0.4	55	<1	0.05	116	20	14	8.26	<2	8	32	<0.01	<10	<10	49	<10	108
1.00		pyrite disseminated	argillic	0.001	<0.2	2.87	43	<10	20	0.6	<2	0.6	<0.5	11	24	17	3.88	10	1	0.11	<10	2.48	585	<1	0.04	6	750	13	4.32	<2	6	47	<0.01	<10	<10	52	<10	108
1.00		pyrite disseminated	hard, propylitic	0.001	<0.2	3.75	26	<10	<10	<0.5	4	0.5	<0.5	38	168	118	6.04	10	1	0.02	<10	4.82	2170	<1	0.04	93	630	10	5.26	<2	24	41	<0.01	<10	<10	190	<10	141
1.00		pyrite disseminated	Tuff breccia, green	0.002	<0.2	4.97	26	<10	10	<0.5	3	0.54	<0.5	31	31	122	8.08	10	2	0.08	<10	4.28	1205	<1	0.06	18	690	11	6.44	<2	19	49	<0.01	<10	<10	276	<10	83
1.10		pyrite disseminated	sericite	0.005	0.2	5.17	33	<10	20	0.5	2	0.33	<0.5	29	34	54	7.61	10	<1	0.1	<10	3.8	471	<1	0.04	14	630	10	5.66	<2	17	31	<0.01	<10	<10	235	<10	51
1.00		pyrite disseminated,veinlets	weakly fractured	0.003	0.3	4.22	29	<10	10	<0.5	2	0.29	<0.5	32	21	135	9.01	10	1	0.1	<10	2.06	124	<1	0.03	17	370	9	9.46	<2	17	31	<0.01	<10	<10	184	<10	48
1.00		pyrite disseminated	soft clay	0.006	0.3	0.41	86	<10	10	<0.5	9	0.12	<0.5	33	22	24	8.43	<10	<1	0.07	<10	0.11	17	1	0.02	13	20	37	8.99	<2	6	17	<0.01	<10	<10	24	<10	6
1.00		pyrite disseminated	propylitic	0.008	0.2	5.16	38	<10	20	<0.5	2	0.38	<0.5	30	32	14	8.44	10	<1	0.11	<10	4.65	628	1	0.03	12	920	11	6.08	<2	18	26	<0.01	<10	<10	211	<10	84
1.00		pyrite disseminated	propylitic	0.017	<0.2	5.18	32	<10	20	<0.5	<2	0.32	<0.5	26	41	30	7.85	10	1	0.08	<10	4.5	664	3	0.03	11	760	12	4.77	<2	18	24	<0.01	<10	<10	204	<10	43
1.00		pyrite disseminated	propylitic	0.02	<0.2	4.47	27	<10	40	<0.5	<2	0.45	<0.5	24	40	78	7.23	10	<1	0.12	<10	3.14	579	3	0.03	10	1120	7	4.52	<2	14	33	<0.01	<10	<10	182	<10	39
1.00		pyrite disseminated	propylitic	0.013	<0.2	5.34	23	<10	30	0.5	<2	0.43	<0.5	20	31	12	6.41	10	<1	0.24	<10	3.46	678	5	0.05	9	930	6	2.68	<2	14	35	<0.01	<10	<10	162	<10	47
1.00	167.55-222.85: propylitic	pyrite disseminated	clay	0.013	<0.2	1.22	43	<10	10	<0.5	3	0.28	<0.5	17	48	22	6.66	<10	<1	0.05	<10	0.42	68	6	0.01	12	780	24	6.88	<2	6	29	<0.01	<10	<10	21	<10	15
1.00		pyrite disseminated	propylitic	0.02	<0.2	4.92	28	<10	20	<0.5	3	0.68	<0.5	22	40	40	7.2	10	1	0.06	<10	4.02	1980	3	0.05	10	710	33	5.24	<2	19	81	<0.01	<10	<10	235	<10	92
1.00		pyrite disseminated	propylitic	0.002	<0.2	5.4	17	<10	20	<0.5	<2	0.74	<0.5	21	38	43	6.96	10	<1	0.05	<10	4.5	2140	1	0.06	10	580	10	4.45	<2	25	78	0.04	<10	<10	266	<10	117
1.00		pyrite disseminated	very weakly argillic	0.003	<0.2	4.85	9	<10	20	<0.5	<2	0.58	<0.5	25	29	46	7.29	10	<1	0.06	<10	4.54	2350	<1	0.05	10	560	9	4.34	<2	22	60	0.03	<10	<10	270	<10	152
1.00		pyrite disseminated	very weakly argillic	0.003	0.2	4.38	9	<10	40	<0.5	<2	0.5	<0.5	27	27	14	7.39	10	<1	0.17	<10	4.09	1780	<1	0.02	11	490	10	5.33	<2	12	57	<0.01	<10	<10	162	<10	76
1.00		pyrite disseminated	very weakly argillic	0.004	0.3	4.06	11	<10	20	<0.5	<2	0.57	0.5	26	27	80	7.59	10	<1	0.09	<10	3.52	1390	1	0.04	12	540	22	6.33	3	16	64	<0.01	<10	<10	211	<10	91
1.00	gradual change	pyrite disseminated	soft clay	0.007	0.4	3.7	26	<10	40	<0.5	<2	0.54	0.8	27	22	83	7.68	10	<1	0.2	<10	2.71	1010	1	0.04	15	730	24	6.51	3	12	52	<0.01	<10	<10	138	<10	80
1.00		pyrite disseminated	in clayish zones	0.016	0.2	3.77	78	<10	40	<0.5	<2	0.38	<0.5	26	30	24	6.94	10	<1	0.16	<10	2.98	1005	<1	0.04	14	610	14	5.41	2	13	35	<0.01	<10	<10	152	<10	98
1.00		pyrite disseminated	argillic-silicification	0.005	0.2	4.19	28	<10	10	0.5	3	0.47	<0.5	19	16	102	6.2	10	<1	0.07	<10	2.03	186	<1	0.03	9	860	13	6.61	<2	13	33	<0.01	<10	<10	126	<10	116
1.00		pyrite disseminated	weak argillization	0.002	0.2	2.87	33	<10	20	0.6	2	0.47	0.5	12	14	61	5.23	10	<1	0.15	<10	1.86	572	<1	0.03	8	930	36	5.72	<2	7	34	<0.01	<10	<10	29	<10	142
1.00		pyrite disseminated	clay	0.005	0.2	3.98	28	<10	30	0.6	4	0.53	1.9	19	19	160	6.26	10	<1	0.17	<10	2.45	1135	<1	0.05	16	1220	22	6.37	2	9	32	<0.01	<10	<10	67	<10	492
1.00		pyrite disseminated	clay	0.006	<0.2	3.95	23	<10	40	0.6	2	0.62	<0.5	18	21	17	6.07	10	<1	0.12	<10	2.67	1040	<1	0.06	14	1160	18	6.2	<2	12	45	<0.01	<10	<10	82	<10	136
1.00	237.50-289.10: sericite+quartz	pyrite disseminated	clay	0.005	<0.2	3.2	20	<10	40	<0.5	4	0.42	<0.5	16	20	11	5.65	10	<1	0.07	<10	1.68	344	<1	0.03	12	590	14	5.94	<2	10	35	<0.01	<10	<10	59	<10	55
1.00		pyrite disseminated	porous tuff breccia	0.009	<0.2	0.48	9	<10	10	<0.5	<2	0.09	<0.5	15	22	11	5.96	<10	<1	0.01	<10	0.12	50	<1	0.01	13	140	12	6.21	<2	3	7	<0.01	<10	<10	11	<10	19
1.10		pyrite disseminated	Tuff breccia, compact	0.004	<0.2	3.62	9	<10	40	0.6	2	0.78	<0.5	14	21	14	5.01	10	1	0.11	<10	3	1735	<1	0.03	9	900	15	4.99	<2	8	75	<0.01	<10	<10	71	<10	160
1.00		pyrite disseminated	Tuff	0.006	<0.2	3.6	18	<10	80	0.5	2	0.68	0.5	14	32	11	5.22	10	<1	0.17	<10	3.13	1955	<1	0.04	10	890	13	4.55	<2	7	71	<0.01	<10	<10	66	<10	186
1.00		pyrite disseminated	Tuff	0.003	<0.2	2.56	3	<10	50	<0.5	2	0.6	<0.5	13	24	10	4.38	<10	<1	0.15	<10	2.07	893	<1	0.04	10	710	13	4.46	<2	4	57	<0.01	<10	<10	47	<10	90
1.00		pyrite disseminated	argillic	0.007	<0.2	3.56	7	<10	20	<0.5	<2	0.76	<0.5	14	23	7	4.89	10	<1	0.09	<10	2.86	989	<1	0.07	10	850	8	4.89	<2	10	69	<0.01	<10	<10	72	<10	50
1.00		mosaic of pyrite disseminated part and pinky (alunite) part		0.002	<0.2	3.80	3	<10	10	<0.5	<2	0.73	<0.5	14	17	9	4.67	10	<1	0.10	<10	2.92	1335	<1	0.06	8	830	8	4.63	<2	8	75	<0.01	<10	<10	88	<10	59
1.00		clayey-fractured gray rock		0.002	<0.2	3.79	3	<10	10	<0.5	<2	0.76	<0.5	14	32	10	4.53	10	1	0.10	<10	2.95	1070	1	0.06	14	820	9	4.70	<2	7	80	<0.01	<10	<10	69	<10	45
1.00		weakly fractured alunite? pyrite rock		0.016	<0.2	3.88	3	<10	10	<0.5	<2	0.64	<0.5	16	28	7	4.97	10	<1	0.12	<10	3.03	934	2	0.05	12	800	32	4.96	<2	6	63	<0.01	<10	<10	68	<10	91
1.00		silicified, pyrite disseminated		0.005	<0.2	4.27	6	<10	90	<0.5	<2	1.24	<0.5	16	26	20	4.57	10	<1	0.11	<10	2.60	1005	5	0.19	13	820	16	4.69	<2	9	257	<0.01	<10	<10	85	<10	56
1.00		silicified, pyrite disseminated		0.003	<0.2	3.78	6	<10	30	<0.5	<2	0.77	0.6	14	45	14	4.38	10	<1	0.15	<10	3.04	1055	1	0.10	15	740	10	4.22	<2	7	145	<0.01	<10	<10	66	<10	86
1.00	39.35-329.65: Sericite->Alunite	green tuff breccia, pyrite disseminated		0.008	<0.2	3.68	9	<10	30	<0.5	<2	0.72	<0.5	12	27	14	4.76	10	<1	0.08	<10	2.85	822	2	0.10	12	790	12	4.79	<2	8	96	<0.01	<10	<10	90	<10	54
1.00		brecciated, pyrite disseminated		0.007	<0.2	3.14	8	<10	10	<0.5	<2	0.58	<0.5	13	11	14	4.63	10	<1	0.12	<10	2.45	654	1	0.08	7	820	8	4.72	<2	7	67	<0.01	<10	<10	79	<10	46
1.00		pyrite disseminated s	pyrite veinlets	0.006	<0.2	3.84	8	<10	40	<0.5	3	0.72	<0.5	18	11	25	4.74	10	<1	0.16	<10	2.70	752	1	0.11	1	870	8	4.59	<2	7	182	<0.01	<10	<10	61	<10	32
1.00		pyrite disseminated s	pyrite veinlets	0.008	<0.2	4.58	2	<10	50	<0.5	2	0.90	<0.5	16	5	61	5.31	10	1	0.14	<10	3.42	757	3	0.16	1	890	10	5.15	<2	10	212	<0.01	<10	<10	141	<10	40
1.00		pyrite disseminated m	silicification weal, alunite?	0.006	<0.2	4.24	2	<10	20	<0.5	2	0.73	<0.5	13	7	51	4.92	10	1	0.18	<10	3.25	700	2	0.12	<1	810	8	4.44	<2	10	135	<0.01	<10	<10	152	<10	39
1.00		pyrite disseminated	pyrite strong	0.007	<0.2	3.89	2	<10	30	<0.5	2	0.80	<0.5	29	13	23	7.87	10	<1	0.20	<10	2.74	596	4	0.16	2	820	12	7.87	<2	8	198	<0.01	<10	<10	124	<10	37
1.00		pyrite disseminated	pyrite strong	0.008	<0.2	4.14	7	<10	20	<0.5	<2	1.16	<0.5	26	23	18	7.97	10	<1	0.20	<10	2.31	536	3	0.31	4	870	9	8.13	<2	7	298	<0.01	<10	<10	118	<10	31
1.00		pyrite disseminated	clayey	0.014	<0.2	4.11	15	<10	30	<0.5	2	0.95	1.2	30	12	47	10.85	10	2	0.14	<10	2.51	860	2	0.19	7	930	13	9.90	<2	12	166	0.01	<10	<10	168	<10	46
1.00		pyrite disseminated	weakly fractured	0.009	<0.2	6.01	<2	<10	50	<0.5	<2	1.47	<0.5	28	7	69	7.82	20	<1	0.11	<10	3.52	1270	3	0.32	<1	810	9	2.19	<2	19	269	0.05	<10	<10	283	<10	79
1.00		pyrite disseminated	Magnetite, biotite?	0.012	<0.2	4.45	3	<10	10	<0.5	<2	0.69	<0.5	16	3	28	7.63	10	<1	0.10	<10	3.23	1195	1	0.11	2	1010	9	1.74	<2	17	78	0.04	<10	<10	236	<10	78
1.00		pyrite disseminated	black streak (tuff?)	0.011	<0.2	3.61	<2	<10	<10	<0.5	<2	0.48	<0.5	20	8	22	7.34	10	<1	0.07	<10	2.96	1085	1	0.08	1	900	5	1.60	<2	19	41	0.04	<10	<10	246	<10	64
1.00		pyrite disseminated	black streak (tuff?)	0.012	<0.2	4.27	<2	<10	10	<0.5	<2	0.85	<0.5	16	8	112	7.18	10	<1	0.09	<10	3.01	1090	2	0.16	2	810	4	0.85	<2	18	101	0.07	<10	<10	273	<10	61
1.00		pyrite disseminated	very weakly silicification	0.009	<0.2	5.66	8	<10	30	<0.5	<2	1.21	<0.5	25	6	27	7.31	10	<1	0.16	<10	3.62	1255	2	0.29	2	880	7	1.53	<2	19	240	0.05	<10	<10	245	<10	84
1.00		pyrite disseminated	clayish	0.023	<0.2	5.01	69	<10	40	<0.5	<2	1.06	1.4	18	7	60	6.32	10	<1	0.15	<10	3.54	1410	3	0.17	1	870	18	3.78	<2	13	166	0.01	<10	<10	168	<10	97
1.20		pyrite disseminated	grayish,compact	0.010	<0.2	4.83	24	<10	20	<0.5	<2	1.76	<0.5	18	20	20	7.97	10	1	0.23	<10	2.19	844	3	0.37	3	890	23	6.35	<2	9	199	0.02	<10	<10	139	<10	66
1.00	330.70-394.50: Propylitic	pyrite disseminated m	black streak	0.021	<0.2	5.70	116	<10	40	<0.5	2	1.03	1.2	28	12	20	9.81	10	<1	0.21	<10	3.47	1440	4	0.26	6	910	32	6.90	<2	14	150	0.01	<10	<10	164	<10	184
1.00		pyrite disseminated m	black streak	0.011	<0.2	4.62	44	<10	10	<0.5	<2	1.47	0.6	23	10	27	6.29	10	<1	0.20	<10	2.39	800	4	0.44	3	780	23	3.43	<2	12	154	0.10	<10	<10	172	<10	122
1.00		pyrite disseminated	pyrite black streak?	0.020	0.2	4.32	17	<10	30	<0.5	<2	1.74	<0.5	20	39	65	7.93	10	1	0.34	<10	1.24	856	4	0.61	7	720	12	3.25	<2	7	170	0.13	<10	<10	138	<10	86
1.35		pyrite disseminated	weak silicification	0.007	<0.2	3.44	14	<10	10	<0.5	<2	0.83	<0.5	10	11	62	4.27	10	<1	0.16	<10	2.99	1385	4	0.13	4	740	10	1.56	<2	13	39	0.10	<10	<10	126	<10	114
0.20		molybdenite, pyrite clay veinlets 2mm		0.017	0.2	3.93	145	<10	<10	<0.5	<2	1.14	<0.5	23	18	142	5.96	10	1	0.13	<10	3.25	1295	102	0.17	7	420	8	2.17	<2	19	51	0.10	<10	<10	281	<10	98
1.00		pyrite disseminated	Magnetite rich	0.029	<0.2	3.83	4	<10	10	<0.5	<2	1.03	0.6	19	14	242	5.71	10	<1	0.11	<10	3.44	1095	10	0.26	8	620	8	1.50	<2	16	81	0.16	<10	<10	229	<10	118
1.00		pyrite disseminated	porphyritic andesite?	0.011	<0.2	3.40	12	<10	<10	<0.5	<2	0.94	<0.5	20	27	144	6.73	10	1	0.08	<10	3.21	1125	16	0.23	8	510	8	1.96	<2	17	54	0.21	<10	<10	319	<10	173
1.00		pyrite disseminated	Magnetite weak	0.019	0.2	3.71	32	<10	<10	<0.5	<2	1.42	<0.5	25	25	113	5.93	10	<1	0.10	<10	2.97	1065	6	0.34	12	510	17	3.93	<2	16	95	0.19	<10	<10	309	<10	158
1.00		pyrite disseminated (quartz+pyrite+sericite)		0.016	0.3	4.66	23	<10	10	<0.5	<2	2.05	<0.5	24	27	219	6.06	10	<1	0.19	<10	2.54	1345	12	0.51	10	600	21	2.62	<2	15	116	0.16	<10	<10	297	<10	154
1.00		pyrite disseminated		0.009	0.2	3.33	6	<10	<10	<0.5	<2	0.75	<0.5	20	12	112	6.42	10	<1	0.07	<10	3.05	1190	4	0.16	6	730	9	0.81	<2	20	37	0.19	<10	<10	326	<10	122
1.00	argillic?	pyrite disseminated		0.012	0.3	3.93	11	<10	20	<0.5	<2	1.52	0.8	18	83	372	6.08	10	<1	0.24	<10	2.23	1010	1	0.3	11	600	23	6.31	2	11	68	0.01	<10	<10	150	<10	142

Table 4-32 Results of Microscopic Observation of Thin Sections, Seweden District

Sample No.	Depth (m)	Field name	Rock type	Texture	Phenocryst or fragment							groundmass or matrix							alteration				Description
					MP	cpx	hb	qz	pl	Kf	op	MP	hb	qz	pl	Kf	gl	op	cb	sm/chl	ser	epi	
S1-81	108. 72	Andesite	altered andesite	porphyritic	(◎)				◎		○	(○)		○	◎		(◎)	○	◎	△			Mafic minerals and glass were totally decomposed into clay minerals.
S1-82	115. 55	Andesite dyke(fragment?)	tuff breccia	clastic to porphyritic	(○)				◎		△	(○)			◎		(◎)	○	◎	·	△		Mafic minerals and glass were totally into clay minerals. Epidote locally replacing plagioclase.
S1-83	146. 80	Diabase	trachite	trachtic	(○)				◎		△			○	◎			△	○		△		Mafic minerals into chlorite. Matrix is silicified.
S1-84	158. 60	Tuff breccia	silicified volcanics	–										◎	◎			△	◎		△		Totally altered and partly silicified. Texture is uncertain.
S1-85	184. 85	Gray fragment of andesitic tuff breccia	silicified volcanics	–										◎	○			○	○				Totally altered and partly silicified. Amygdule of calcednic quartz is common.
S1-86	232. 00	Tuff breccia	altered volcanics	–										◎	○			○	◎	△			Mafic minerals and glass totally decomposed into clay minerals. partly silicified pools.
S1-88	376. 35	Porphyry	altered andesite	porphyritic	(○)				◎		○			△	◎		(◎)	○		◎		△	Mafic minerals and glass into chlorite and clay minerals. Actinolite occurs as an aggregate.
S1-157	300. 00	Silicified rock	altered volcanics	–										◎	○			○		◎	△		Texture is uncertain. Quartz vein occurs. partly silicified.

/roxene, pl=plagioclase, op=opaque minerals, qz=quartz, hb=hornblende
ɜ, ser=sericite, Kf=K-feldspar, epi=epidote, sm/chl=smectite or chlorite
◎common, △small, ·rare

Table 4-33 Results of X-ray Diffraction Analysis, Seweden District

Drill Hole	Sample No	Depth (m)	Quartz Index										
			Qtz	Pl	Sm	Chi	Se	Kao	Pyr	Al	Py	Mt	Cpx
MJIE-S1	S1-101	290.35	51		11	7					28		
	S1-102	294.60	52		5	6					58		
	S1-103	112.35	54		11	6					34		
	S1-104	126.25	51			18	12				132		
	S1-105	134.30	51				4	8	8				
	S1-106	139.35	9		15	12							
	S1-107	186.10	28		9	34	4				21		
	S1-108	269.35	19		6						118		
	S1-109	283.65	68		6	5					35		
	S1-110	283.70	57		6	7							
	S1-111	5.00	135					18		48			
	S1-112	25.70	78					11		303			
	S1-113	41.00	80					131	48		35		
	S1-114	52.90	68					13		90	48		
	S1-115	70.00	136					24	4	7			
	S1-116	82.20	49				8	33			52		
	S1-117	96.00	47		4	17					46		
	S1-118	109.20	19	55	20	18					44		
	S1-119	120.40	27	89	7	7					43		
	S1-120	129.00	34				5	25			30		
	S1-121	146.75	24	99	18	10					43		
	S1-122	158.55	44		tr	23					63		
	S1-123	166.40	13				9	94			76		
	S1-124	181.00	39			27					14		
	S1-125	194.85	25					17	6		54		
	S1-126	211.35	21	23		21					27		
	S1-127	225.40	28		tr	9					33		
	S1-128	241.15	104			tr					31		
	S1-129	250.20	9			11					47		
	S1-130	267.20	109					113	22		30		
	S1-131	284.30	79	7		9					29		
	S1-132	290.35	55	19	11	9					23		
	S1-133	304.00	63	41	8	10					22		
	S1-134	313.85	36	92	12	9					15		
	S1-135	325.50	66	13	7	9					14		
	S1-136	336.90	28	12	9	17						49	
	S1-137	345.50	61		8	19	4				10		
	S1-139	361.80	30	64		8						63	
	S1-140	374.60	12	134		13						43	9
	S1-141	390.00	17	106		16	tr					51	
	S1-142	385.50	35	51	tr						47		
	S1-148	271.00	67		21						61		

Qtz:Quartz, Pl: Plagioclase, Chl: Chlorite, Se: Sericite, Cal: Calcite, Sm: Smectite, Kao:Kaolinite, Py: Pyrite, Cpx: Clino-pyroxene, Al:Aumite, Mt: Magnetite
Pyr:Pyrophyllite

Table 4-34 Results of Microscopic Observation of Polished Sections, Seweden District

Sample No.	Drilled Lengthth(m)	Ore minerals							Gangue minerals							
		Py	Cp	Sph	Aca	Cer	Ang	others	si	kao	se	kf	chl	cly	cal	others
S1-89	69.00	○		△					◎	◎						
S1-90	141.45	○		△					◎					◎		
S1-91	188.75	◎							◎					◎		Ti(△)
S1-92	205.55	◎	・			・		Pyr(・)					◎	◎		
S1-93	260.60	○		△					◎					◎		apa(△)
S1-94	290.30	◎	・					Pyr(△)	◎					◎		Ti(△)
S1-95	326.10	○	・	・			・		◎			△		◎		apa(△)
S1-96	389.15	◎	・				・		◎	○	◎				○	

Abbreviation:
Py=pyrite,Cp=chalcopyrite,Cer=cerussite,Ang=anglesite si=SiO2 minerals, chl=chlorite ,cly=clay mineral,kao=kaolinite cal=calcite, kf=K-feldspar
Sph=sphalerite, Pyr=pyrrhotite se=sericite or muscovite, Ti=TiO2 polymorph, apa=apatite,

◎=abundant, ○=common, △=small, ・=rare

Table 4-35 Fluid Inclusion Study of Drill Core Samples, Seweden District (1/2)

Sample number	Mineral	Size (μm)	primary or secondary	form	Phasee	Salinity (wt%.NaCl)	Th(℃)
	calcite	17	secondary	irregular	liquid dominant two phases	0.2	163
	calcite	8	secondary	irregular	liquid dominant two phases	0.0	unmeasurable
	calcite	6	secondary	irregular	liquid dominant two phases	0.2	unmeasurable
	calcite	21	secondary	idiomorphy	liquid dominant two phases	0.2	200
	calcite	12	secondary	irregular	liquid dominant two phases	0.4	200
	calcite	14	secondary	irregular	liquid dominant two phases	0.2	unmeasurable
	calcite	8	secondary	irregular	liquid dominant two phases	0.2	201
	calcite	7	secondary	irregular	liquid dominant two phases	0.2	200
S1-297	calcite	8	secondary	irregular	liquid dominant two phases	0.0	141
342.65m	calcite	11	secondary	irregular	liquid dominant two phases	1.6	unmeasurable
	calcite	13	secondary	idiomorphy	liquid dominant two phases	0.0	173
	calcite	7	secondary	idiomorphy	liquid dominant two phases	0.0	155
	calcite	6	secondary	idiomorphy	liquid dominant two phases	0.0	172
	calcite	5	secondary	irregular	liquid dominant two phases	0.6	192
	calcite	5	secondary	irregular	liquid dominant two phases	0.6	178
	calcite	31	secondary	irregular	liquid dominant two phases	0.0	193
	calcite	10	secondary	irregular	liquid dominant two phases	0.0	181
	calcite	12	secondary	irregular	liquid dominant two phases	0.2	195

Samplenumber	mineral	Size(um)	Primary or Secondary	Form	Phases	Th(℃)	first ice melting temperature(oC)	Final melting temperature (oC)	Major components	Salinity	Remarks
	quartz	5	secondary	ellipsoidal	liquid dominant	427					
	quartz	15	secondary	irregular	liquid dominant	unmeasurerale due to decrepitation	-44.4	-24.3	H2O-NaCl-CaCl2system ?	23.2 wt % $CaCl_2$ eq	Estimated from final ice melting temperature and H2O-NaCl-CaCl2system
	quartz	4	secondary	ellipsoidal	liquid dominant	426					
	quartz	10	secondary	irregular	liquid dominant	416		-25.4	H2O-NaCl-CaCl2system ?	23.8 wt % $CaCl_2$ eq	Estimated from final ice melting temperature and H2O-NaCl-CaCl2system
	quartz	10	secondary	irregular	liquid dominant	416	-45.9	-27.4	H2O-NaCl-CaCl2system ?	24.4 wt % $CaCl_2$ eq	Estimated from final ice melting temperature and H2O-NaCl-CaCl2system
	quartz	16	secondary	irregular	liquid dominant	unmeasurerale due to decrepitation		-0.5	H2O-NaClsystem	0.9 wt % NaCl eq	
	quartz	18	secondary	irregular	liquid dominant	unmeasurerale due to decrepitation		-0.5	H2O-NaClsystem	0.9 wt % NaCl eq	
S1-97F	quartz	15	secondary	irregular	liquid dominant	464	-40.3	-23.0	H2O-NaCl-CaCl2system ?	22.4 wt % $CaCl_2$ eq	Estimated from final ice melting temperature and H2O-NaCl-CaCl2system
	quartz	10	secondary	irregular	liquid dominant	unmeasurerale due to decrepitation	-46.7	-25.9	H2O-NaCl-CaCl2system ?	23.8 wt % $CaCl_2$ eq	Estimated from final ice melting temperature and H2O-NaCl-CaCl2system
	quartz	7	secondary	irregular	liquid dominant	unmeasurerale due to decrepitation	-41.2	-25.0	H2O-NaCl-CaCl2system ?	23.5 wt % $CaCl_2$ eq	Estimated from final ice melting temperature and H2O-NaCl-CaCl2system
	quartz	8	secondary	ellipsoidal	liquid dominant	426					
	quartz	6	secondary	ellipsoidal	liquid dominant	475					
	quartz	2	secondary	ellipsoidal	liquid dominant	392					
	quartz	2	secondary	ellipsoidal	liquid dominant	400					
	quartz	4	secondary	irregular	liquid dominant	418					
	quartz	6	secondary	irregular	liquid dominant	442					

Table 4-35 Fluid Inclusion Study of Drill Core Samples, Seweden District (2/2)

Inclusion number	mineral	Size(um)	Primary or Secondary	Form	Phases	Th(℃)	first ice melting temperature(oC)	Final melting temperature (oC)	Major components	Salinity	Remarks
	quartz	20	secondary	irregular	liquid dominant	257	-19.8	-2.2	H2O-NaClsystem	3.7 wt % NaCl eq	
	quartz	20	secondary	irregular	liquid dominant	unmeasurerale due to decrepitation	-22.8	-2.1	H2O-NaClsystem	3.5 wt % NaCl eq	
	quartz	8	secondary	irregular	liquid dominant	354	-16.1	-2.9	H2O-NaClsystem	4.8 wt % NaCl eq	
	quartz	35	secondary	irregular	liquid dominant	unmeasurerale due to decrepitation	-22.8	-6.7	H2O-NaClsystem	10.1 wt % NaCl eq	
	quartz	6	secondary	irregular	liquid dominant	unmeasurerale due to decrepitation		-1.0	H2O-NaClsystem	1.6 wt % NaCl eq	
	quartz	6	secondary	irregular	liquid dominant	unmeasurerale due to decrepitation		-1.1	H2O-NaClsystem	1.8 wt % NaCl eq	
	quartz	7	secondary	irregular	liquid dominant	unmeasurerale due to decrepitation		-0.7	H2O-NaClsystem	1.3 wt % NaCl eq	
	quartz	8	secondary	ellipsoidal	liquid dominant	unmeasurerale due to decrepitation		-0.5	H2O-NaClsystem	0.9 wt % NaCl eq	
	quartz	20	secondary	irregular	liquid dominant	152		-1.9	H2O-NaClsystem	3.2 wt % NaCl eq	
	quartz	6	secondary	irregular	liquid dominant	268		-1.9	H2O-NaClsystem	3.2 wt % NaCl eq	
	quartz	24	secondary	irregular	liquid dominant	265		-1.8	H2O-NaClsystem	3.0 wt % NaCl eq	
S1-75F	quartz	8	secondary	irregular	liquid dominant	190		-1.9	H2O-NaClsystem	3.2 wt % NaCl eq	
	quartz	30	secondary	irregular	liquid dominant	277	-17.8	-2.3	H2O-NaClsystem	3.8 wt % NaCl eq	
	quartz	6	secondary	ellipsoidal	liquid dominant	372		-1.9	H2O-NaClsystem	3.2 wt % NaCl eq	
	quartz	3	secondary	irregular	liquid dominant	238		-1.8	H2O-NaClsystem	3.0 wt % NaCl eq	
	quartz	36	secondary	irregular	liquid dominant	345	-13.4	-2.9	H2O-NaClsystem	4.8 wt % NaCl eq	
	quartz	6	secondary	irregular	liquid dominant	383		-2.8	H2O-NaClsystem	4.6 wt % NaCl eq	
	quartz	4	secondary	ellipsoidal	liquid dominant	unmeasurerale due to decrepitation		-1.1	H2O-NaClsystem	1.8 wt % NaCl eq	
	quartz	5	secondary	idiomorphic	liquid dominant	359		-2.6	H2O-NaClsystem	4.3 wt % NaCl eq	
	quartz	7	secondary	irregular	liquid dominant	348		-3.1	H2O-NaClsystem	5.1 wt % NaCl eq	
	quartz	6	secondary	irregular	liquid dominant	337			H2O-NaClsystem		
	quartz	20	secondary	irregular	liquid dominant	405	-20.3	-1.8	H2O-NaClsystem	3.0 wt % NaCl eq	
	quartz	5	secondary	irregular	liquid dominant	379		-3.0	H2O-NaClsystem	5.0 wt % NaCl eq	

S1-72A Liquid dominant two phase inclusions

Sample number	Mineral	size (um)	Primary or secondary	Form	Phase	Th(℃)	First melting temperature (T℃)	Final melting temperature (T℃)	Salinity (wtNaCleq.)
S1-72A 1-1	quartz	16	secondary	irregular	Liquid dominant multi-phase inclusions	Gas disappear		-0.5	0.9
S1-72A 1-2	quartz	7	secondary	irregular	Liquid dominant multi-phase inclusions	291		-0.5	0.9
S1-72A 1-3	quartz	13	secondary	irregular	Liquid dominant multi-phase inclusions	291	-19.9	-0.5	0.9
S1-72A 1-4	quartz	19	secondary	irregular	Liquid dominant multi-phase inclusions	355		-0.5	0.9
S1-72A 1-5	quartz	11	secondary	irregular	Liquid dominant multi-phase inclusions	unmeasurerale due to decrepitation	-19.6	-0.5	0.9

S1-72A Liquid dominant multi-phase inclusions

Sample number	Mineral	size (um)	Primary or secondary	Form	Phase	Th of each phase (℃)			Salinity (wtNaCleq.)
						KCl	NaCl	gas	
S1-72A 1-9	quartz	6	secondary	idiomorphic	Liquid dominant multi-phase inclusions		273	400	NaCl: 36.2 wt %
S1-72A 1-10-1	quartz	6	secondary	irregular	Liquid dominant multi-phase inclusions		325	359	NaCl: 40.2 wt %
S1-72A 1-10-2	quartz	3	secondary	irregular	Liquid dominant multi-phase inclusions		331	368	NaCl: 40.7 wt %
S1-72A 1-11	quartz	7	secondary	idiomorphic	Liquid dominant multi-phase inclusions		> 446℃	> 446℃	> NaCl: 52.8 wt %

No measurable inclusions are included in the following samples

Sample No.	Drilled Lengthth(m)
S1-97	211.35
S1-98	212.30
S1-99	271.90
S1-100	290.30