Chapter 10. Sensitivity Analysis

Although the internal rates of return indicated in the Chapters 8 and 9 have been estimated after careful examination of each account items, they still contain not a few uncertain factors as various assumptions were introduced in the process of estimation. It is highly probable, therefore, that after the project has been put into execution, the assumed values change and the IRR change accordingly.

10.1 Sensitivity Analysis of Financial Valuation

The financial analysis has indicated the low rate of return. Study is made to verify a few cases where revenue from product sale increases and where investment expenditure or operating expenses decrease. In reverse cases such as a decrease of revenue or an increase of expenses, the IFRR naturally will decline even further and project desirability will be substantially lowered.

Firstly, the quotations of gold, silver, lead and zinc are supposed to increase by 10%, respectively. (Gold $429/tr oz, silver $5.83/tr oz, lead $715/t and zinc $1,210/t) In this case, the IFRR comes to 3.0%. Suppose the quotations increase by 20%, the IFRR ascends to 7.9%.

If sales revenue remains as it is and financial cost decreases, it will enhance the project profitability, as well. In case investment expenditure and operating expenses are lowered by 10% or 20% in real terms, the IFRR comes to 1.4% or 6.1%, respectively, the latter being almost equal to the interest rate of 6% p.a. These analyses are tabulated in the following Table 43.

	20% less	10% less	Original	10% up	20% up
Changes in revenue (Au, Ag, Pb, Zn)	-	-	(-)3.0%	3.0%	7.9%
Changes in expenditure(Investment exp; operating exp)	6.1%	1.4%	(-)3.0%	-	-

Table 43 Sensitivity Analysis of Financial Valuation

10.2 Sensitivity Analysis of Economic Valuation

The economic valuation turns out to be more favorable than the financial analysis. If project revenue increases or project expense decreases, it will further improve the project profitability. Trial computation is made to verify reverse cases where revenue decreases, where expenditure increases, and where the both cases take place simultaneously.

It is supposed that the quotation of gold, silver, lead and zinc decline by 20% whereby revenue is substantially reduced. (Gold $312/tr oz, silver $4.24/tr oz, lead $520/t and zinc $880/t) In this case, the IFRR sharply falls down to (−)8.0% from 8.3%, the original estimate. If the metal quotations decline by 10%, the IFRR comes to 0.7%.

Should economic expenses supposedly increase by 10%, the IFRR comes to 4.1%.

It may be concluded, therefore, that, unless the metal quotations increase or expenditure decreases from the level of original estimate, the project economic feasibility will not reach a satisfactory level. The sensitivity analysis of economic valuation is tabulated in the following Table 44.

	20% less	10% less	Original	10% up	20% up
Changes in revenue (Au, Ag, Pb, Zn)	(-)8.0%	0.7%	8.3%	15.1%	21.2%
Changes in expenditure(investment exp; operating exp)	19.0%	13.2%	8.3%	4.1%	-

Table 44 Sensitivity Analysis of Economic Valuation

Chapter 11. Conclusions and Future Vision

11.1 Conclusions : Overall Project Valuation

11.1.1 Investment desirability

Conclusions of the overall project valuation may be summarized as follows:

(1) The internal financial rate of return(IFRR) is computed at(−)3.0% under the project assumptions. At this rate of return, it is certainly difficult for a private company to put the project into execution, relying on borrowings.

(2) The internal economic rate of return(IERR) comes to 8.3%, which is a delicate rate to judge the project desirability from the national point of view.

As this study places emphasis on the mine profitability, socio-economic benefits pertinent to the economic analysis are not quantified in this study. Conceivable socio-economic benefits brought about by realization of the project include indirect contribution to the regional development by construction of the power facilities, road improvement, etc. and repercussion effect that the mine development and operation may produce to local industries such as civil constructors, ironworks, machinery repair shops, transporters, stock raisers, etc. If these benefits and effects are taken into consideration, it will certainly push up the project economic valuation to a higher level.

(3) The wide gap between the IFRR and the IERR is mainly attributable to the difference in treatment of tax and labor cost between the financial and economic valuations. Especially, treatment of tax has great influence.

While the financial analysis uses for project valuation market price which include tax, economic analysis employs accounting price, since tax is considered as transfer cost. The high tax rates in Mongolia helps widen the gap between IFRR and IERR.

The financial cost of unskilled labor is measured in this study twice as high as opportunity cost, following the general prediction that, in an economy with a high unemployment rate, wage cost of unskilled labor comes higher than opportunity

cost. This also helps make the financial cost far higher than the economic cost.

(4) Sales revenue is based on the assumed product price of $390/tr oz for gold, $5.30/tr oz for silver, $650/t for lead and $1,100/t for zinc. If, in the future, these metal quotations increase by 20% excluding inflation, the IFRR will come to 7.9%, a level somewhat higher than the assumed interest rate of 6% p.a.

(5) In a negative case where sales revenue declines by 10% in real terms or in case investment expenditure or operating expenses increase by 10%, the IERR will be lowered to 0.7% or 4.1%, respectively. If, conversely, product prices increase by 10%, or if expenditure decreases by 10%, the IERR will reach 15.1% or 13.2%, respectively. Such simulation suggests that unless the product prices increase or expenditure is substantially curtailed, it will be difficult for the project to be put into execution.

(6) Desirability of the development of Tsav deposits, or the overall project valuation, depends on whether the financial valuation can be improved by means of effective policy measures including grant aid, low-interest loans, tax incentives, etc.; if no such measures are taken, the project desirability has to remain low.

11.1.2 Policy recommendation

To improve the project financial valuation, the following measures may be proposed.

(1) As already discussed, the gap between the project IFRR and IERR is largely attributable to tax. The smaller the tax cost is, the higher IFRR is. Hence, certain tax incentives/benefits aimed at promotion of mine development are recommended. Reduction or exemption of customs duty, corporate income tax and/or royalty will greatly help improve the project financial valuation.

(2) Government financial assistance is also of great importance, which may include providing low-interest loans, permitting deferred payment of loan principal and interest, etc. On the other hand, a project owner's endeavor is required for obtaining low-interest loan from international financing agencies to the maximum possible extent.

(3) Construction of the power transmission line being of the public nature, the user's share in the construction cost is desirably shouldered by the State.

(4) It may be worth consideration that the final feasibility study on the project which is to follow this study would be performed under an international agency's assistance(the World Bank, etc.) or under a grant aid that provides testing facilities, etc., thereby avoiding the project owner bearing all the cost.

(5) Should either one of the above proposals be put into practice, it would help improve the project financial valuation. To sum up, flexible management of the financial and fiscal policies will be the key to improvement of the project desirability.

11.2 Future Vision

The pre-feasibility study indicates that the so far acquired ore reserves and the deposit size are not large enough to allow production and sales revenue to expand by increased investment; in other words, the economies of scale cannot be expected. This constrains a decision for immediate development of the deposits.

Around the Tsav deposits in Dornod Prefecture, there are a number of promising ore deposits including Ulaan and Bajan-Uul. Once the Tsav deposits are developed, it could facilitate and activate development of the other deposits as satellite mines, which would possibly permit ore treatment at Tsav to be expanded. The Tsav mine could play a leading role in providing exploration, mining and operation technologies to these mines, The Tsav project could become a model mine for underground operation which is lacking in Mongolia. Besides, its development involves no exorbitant capital outlay.

These considerations lead to a recommendation that other ore deposits in the surrounding area should be explored, as well. If other deposits are explored, possibility of mixed ore treatment can be studied using ore samples collected from the exploration site. It appears reasonable, therefore, that after such exploration and mineral dressing tests of other deposits, a decision would be taken, based on newly obtained data, as to whether to perform the final feasibility study on the project possibly in an expanded scale.

V . Attached Data

	Contents of Study	Quantity	June	July	August	September	October	November	December	Junuary	February	Note
1	Trip to Mongolia			18–20 Delegates	Tunneling 7	14	General Manager 25					
	Return trip				15–17 Metallurgist	9	16	27 Boring, Others				
2	Transportation of Equipment To Mongolia		31									Arrive at Tsav on 23, 24, 26 and 31 July seperately
	From Mongolia											
3	Tunneling											
	Drift Northward	121.0m		27	26							
	No.5 Waste Pit	33.1m			27	6						
	Core Boring											
	Underground(6pcs)	186.5m			28	12						
	Surface (8pcs)	305.7m		25	28							
	Pre-F/S and Mineral Dressing Test			20					29			
4	Report						1				23	
5	Delegates											
	General Manager	1people		18			27					
	Administer	1		18			16					
	Chief Tunneling	3		18		9						
	Assistant Tunneling	3		18		9						
	Chief Mechanical	1		18			16					
	Chief Electrical	1		18			16					
	Chief Geologist	1		18			16					
	Chief Boring	3		18			16					
	Metallurgist	1		18	17							

Apx. 1 Progress schedule of Tunneling

Starting Date		1995.07.20						
Tunnel Starting Date		1995.07.27						
Tunnel completing Date		1995.09.06						
Completing Date		1995.09.06						
		up-to-1995.09.06			up-to-1995.09.06			Note
		day	rate (%)		day	rate (%)		
Tunnel		36	83.7	73.5	36	83.7	73.5	
Construction		7	16.3	14.3	7	16.3	14.3	
Others								
Sub-total		43	100.0	87.8	43	100.0	87.8	
Day off		6		12.2	6		12.2	
Total		49		100.0	49		100.0	
		Tunnel		Construction		Others		Note
Worker	Interior Exterior	321 878		181		-		
Engineer	Interior Exterior	559		178				
Total	Interior Exterior	880 878		359				
Total		1,758		359				
		up-to-1995.09.06			up-to-1995.09.06			Note
per working day		3.56			3.56			
per tunneling day		4.25			4.25			
per required day		3.12			3.12			
per required man		0.074			0.074			
number of timbering		71			71			
length of timbering(%)		101.7m (66.5%)			101.7m (66.5%)			

Apx. 2 Tunneling Prospecting

Works		Period of tunneling						Total	Breakdown		Additional construction					
		Construction	day	tunnel	day	Dismantle	day		working	day off	Generator	day	Workshop	day		
Preparation		7/20~ 7/26	days 7		days		days	days 7	days 7	days -		days		days		days
Northward Drift				7/27 ~ 8/26	31			31	27	4						
Fifth Waste Pit				8/27 ~ 9/6	11			11	9	2						
Demobization																
Total			7		42			49	43	6						

Apx. 3 Details of required days for Tunneling

Works		Number of shift		Number of person		Each Working Time									
		Tunneling Shift	Total Shift	Engineer	Worker	Driling	Loading Hauling	Other's Interior	Other's Exterior						Total
Preparation		Shifts	Shifts 7	persons 178	persons 181	hrs	hrs	hrs 168	hrs						hrs
Northward Drift		81	81	270	231	153	341	2.258	5.184						
Fifth Waste Pit		28	28	100	90	82	165	803	1.728						
Demobilization															
Total		109	116	548	502	235	506	3.229	6.912						

Apx. 4 Each work progressive efficiency of Tunneling

Item	Specifications	Quantity	Note
Bit		pieces	
	51m/mϕ R32	25	
	89m/mϕ R32	4	
	38m/mϕ R28	4	
	Insert	-	
Rod			
	38m/mHEX L=3,700	37	
	32m/mHEX L=2,365	4	
Shankrod			
	38m/mϕ HD-150	10	
Sleeve			
	38m/mϕ	15	
	38/32m/mϕ	5	
Explosive			
Ammonita		3,542 Kg	
Detonator		4,499 pieces	
Timberings			
	Type 2	67 set	
	Type 3	6	
Rock-bolt	22m/mϕ L=2.0m	315 pieces	
Pipe			
	2inch	80 m	
	4inch	-	
Light Oil		95,700 ℓ	
Gasoline		2,500	
Kerosene		1,800	
Lubricant			
	Engine Oil 10#	800	
	Engine Oil 30#	2,400	
	Engine Oil 40#	-	
	Hydraulic Oil 32#	1,000	
	Oil 46#	1,000	
	Break Oil TD4	30	

Apx. 5 Item of consumptive materials of Tunneling

	Contents of Study	July 10	July 20	August 10	August 20	September 10	September 20	Note
1	Mobilization (Narita～Peijin～ Ulaanbaatar～Tsav)		18 20					
2	Opening Cargos & Transportation		21 24					
3	Drilling							
	MJMT－28 35.50m		25 28					
	MJMT－27 36.60m		29 1					
	MJMT－26 34.70m			2 5				
	MJMT－25 36.50m			6 10				
	MJMT－24 37.60m			11 15				
	MJMT－23 40.70m			16 19				
	MJMT－22 43.60m			20 23				
	MJMT－21 40.50m			24 26				
	MJMT－20 40.00m			27 31				
	MJMT－19 35.20m			31 2				
	MJMT－15 20.20m			3 5				
	MJMT－16 25.70m			5 7				
	MJMT－17 30.10m			7 9				
	MJMT－18 35.30m			9 12				
4	Transportation & Packing					13		
5	House					13		
6	Demobilization (Tsav～Ulaanbaatar～ Peijin～Narita)					14 16		

Apx. 6 Progress schedule of Drilling

D.D Hole No.	Preparation Demobi	Period of drilling							Breakdown		Additional Work drilling						Breakdown	
		Rig-up	day	Drilling	day	Rig-down	day	Total	Working	Day off	Mobilization	day	Demobilization	day	House	day	Working	Day off
	Preparation	—	days —	—	days —	—	days —	days —	days —	days —	7/21	days 1.0	7/22 ~ 7/24	days 3.0	—	days —	days 2.0	days 1.0
MJMT-15		9/3 ~ 9/4	1.3	9/4 ~ 9/5	0.9	9/5	0.1	2.3	1.3	1.0	—	—	—	—	—	—	—	—
MJMT-16		9/5	0.3	9/5 ~ 9/7	1.5	9/7	0.2	2.0	2.0	—	—	—	—	—	—	—	—	—
MJMT-17		9/7	0.3	9/7 ~ 9/9	1.8	9/9	0.2	2.3	2.3	—	—	—	—	—	—	—	—	—
MJMT-18		9/9	0.4	9/10 ~ 9/12	2.9	9/12	0.1	3.4	2.4	1.0	—	—	—	—	—	—	—	—
MJMT-19		8/31	0.3	9/1 ~ 9/2	1.8	9/2	0.2	2.3	2.3	—	—	—	—	—	—	—	—	—
MJMT-20		8/28	0.3	8/29 ~ 8/31	2.5	8/31	0.2	3.0	3.0	—	8/28	0.4	—	—	—	—	0.4	—
MJMT-21		8/25	0.5	8/25 ~ 8/27	2.5	8/28	0.3	3.3	3.3	0.3	—	—	—	—	—	—	—	—
MJMT-22		8/20 ~ 8/21	1.7	8/21 ~ 8/24	3.0	8/24	0.3	5.0	4.0	1.0	—	—	—	—	—	—	—	—

Apx. 7–1 Details of required days for Drilling

D.D Hole No	Prepa-ration Demobi	Period of drilling							Breakdown		Additional Work drilling						Breakdown	
		Rig-up	day	Drill-ing	day	Rig-down	day	Total	Workin	Day off	Mobili-zation	day	Demobi-lization	day	House	day	Working	Day off
			days		days		days	days	days	days		days		days		days	days	days
MJMT-23		8/16	1.0	8/17 ~ 8/19	2.7	8/19	0.3	4.0	4.0	-	-	-	-	-	-	-	-	-
MJMT-24		8/11	1.0	8/12 ~ 8/15	3.7	8/15	0.3	5.0	4.0	1.0	-	-	-	-	-	-	-	-
MJMT-25		8/ 6 ~ 8/ 7	2.0	8/ 8 ~ 8/10	2.3	8/10	0.7	5.0	4.0	1.0	-	-	-	-	-	-	-	-
MJMT-26		8/ 2 ~ 8/ 3	1.3	8/ 3 ~ 8/ 5	2.3	8/ 5	0.4	4.0	4.0	-	-	-	-	-	-	-	-	-
MJMT-27		7/29	1.0	7/30 ~ 8/ 1	2.7	8/ 1	0.3	4.0	3.0	1.0	-	-	-	-	-	-	-	-
MJMT-28		7/25	0.7	7/26 ~ 7/28	2.5	7/28	0.5	3.7	3.7	-	7/25	0.3	-	-	-	-	0.3	-
Demobilization	Demobi lization	-	-	-	-	-	-	-	-	-	9/13	0.5	-	-	9/13	0.5	1.0	-
Total			12.3		31.7		4.0	48.0	42.0	6.0		3.1		3.4		0.5	5.0	2.0

Apx. 7-2 Details of required days for Drilling

Name of holes	Drilling result			Numbers Of Shift		Numbers Of Worker				Classification Of Drilling Works									
	Bit Diameter	Drilling Length	Core Length	Drilling Shift	Total Shift	Engineer	Driller	Interpreter	Others	Drilling Time	External Drilling Time	Trouble Recovery	Subtotal	Rig up Rig down	Site Preparation	Open Packing	Mobilization Demobilization	Road Mentenance Others	Total
	mm	m	m	Shifts	Shifts	Persons	Persons	Persons	Persons	hrs	hrs	hrs	hrs	hrs	hrs	hrs	hrs	hrs	hrs
Mobilization				3.0	3.0	9	–	–	–	–	–	–	–	–	8.00	–	–	16.00	24.00
Temporary Construction				3.0	3.0	9	18	–	–	–	–	–	–	–	–	–	–	–	–
MJMT-15	66 NQ	1.40 18.80	1.40 18.50	4.0	4.0	4	8	–	–	10.00	7.00	–	17.00	12.00	–	–	–	3.00	32.00
MJMT-16	66 NQ	1.40 24.30	1.40 24.30	6.0	6.0	6	12	–	–	18.00	18.00	–	36.00	10.00	–	–	–	2.00	48.00
MJMT-17	66 NQ BQ	1.60 14.10 14.40	1.60 14.10 14.30	7.0	7.0	7	14	7	–	20.00	22.00	–	42.00	12.00	–	–	–	2.00	56.00
MJMT-18	66 NQ BQ	1.20 20.60 13.50	1.20 20.60 13.30	7.0	7.0	7	14	7	–	20.00	24.00	–	44.00	10.00	–	–	–	2.00	56.00
MJMT-19	66 NQ BQ	1.20 20.80 13.20	1.20 19.90 13.20	7.0	7.0	7	14	–	–	23.00	17.00	–	40.00	10.00	–	–	–	6.00	56.00
MJMT-20	66 NQ	18.20 21.80	18.20 21.50	10.0	10.0	10	20	–	–	28.00	22.00	4.00	54.00	10.00	–	–	–	16.00	80.00
MJMT-21	96 NQ BQ	2.40 0.60 37.50	2.40 0.20 35.10	9.0	9.0	9	18	–	–	20.00	28.00	–	48.00	20.00	–	–	–	4.00	72.00
MJMT-22	96 76 NQ	2.30 3.50 37.80	2.30 3.00 37.60	12.0	12.0	12	24	–	–	18.00	30.00	12.00	60.00	24.00	–	–	–	12.00	96.00

Apx. 8–1 Each Work progressive efficiency of Drilling

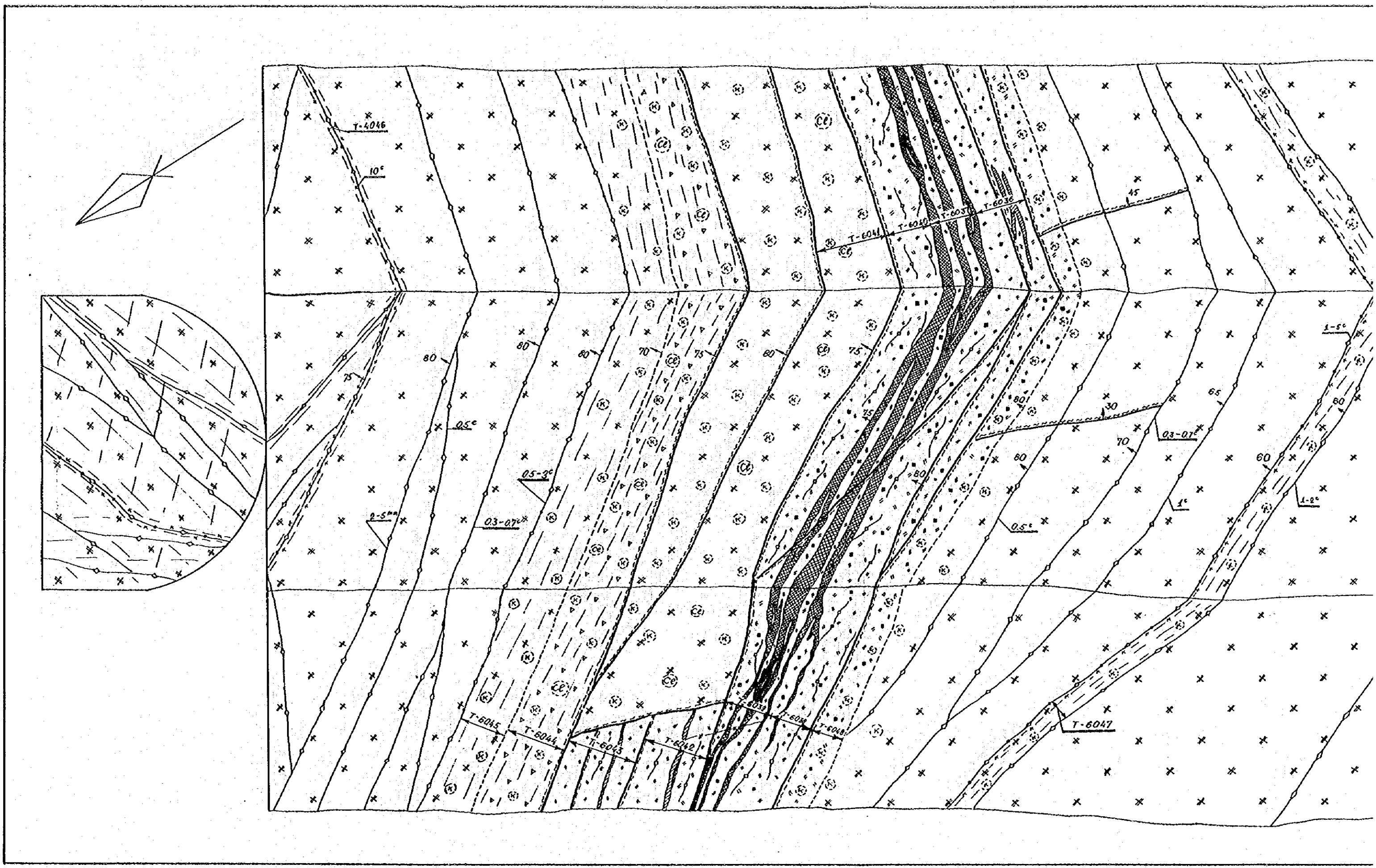
Name of holes	Drilling result			Numbers Of Shift		Numbers Of Worker				Classification Of Drilling Works									
	Bit Diameter	Drilling Length	Core Length	Drilling Shift	Total Shift	Engineer	Driller	Interpreter	Others	Drilling Time	External Drilling Time	Trouble Recovery	Subtotal	Rig up Rig down	Site Preparation	Open Packing	Mobilization Demobilization	Road Mentenance Others	Total
	mm	m	m	Shifts	Shifts	Persons	Persons	Persons	Persons	hrs	hrs	hrs	hrs	hrs	hrs	hrs	hrs	hrs	hrs
MJMT-23	96 76 NQ	3.00 4.30 33.40	3.00 3.90 33.00	12.0	12.0	12	24	–	–	26.00	38.00	–	64.00	32.00	–	–	–	–	96.00
MJMT-24	96 76 NQ	3.00 1.90 32.70	3.00 1.60 32.20	12.0	12.0	12	24	–	–	29.00	31.00	4.00	64.00	32.00	–	–	–	–	96.00
MJMT-25	96 76 NQ	2.70 2.20 31.60	2.70 2.00 29.00	12.0	12.0	12	24	–	–	22.00	28.00	6.00	56.00	40.00	–	–	–	–	96.00
MJMT-26	96 NQ	3.20 31.50	3.20 27.70	12.0	12.0	12	24	–	–	24.00	32.00	8.00	64.00	32.00	–	–	–	–	96.00
MJMT-27	96 NQ	2.10 34.50	1.10 32.60	9.0	9.0	9	18	–	–	19.00	21.00	–	40.00	32.00	–	–	–	–	72.00
MJMT-28	96 NQ	1.90 33.60	1.90 31.90	11.0	11.0	12	24	–	–	20.00	36.00	–	56.00	24.00	–	–	–	8.00	88.00
Carry out & Storage	–	–	–	Mongolian Member 1.0	1.0	3	Mongolian Side 6	3	–	–	–	–	–	–	–	–	–	8.00	8.00
Demobilization	–	–	–	3.0	3.0	18	–	–	–	–	–	–	–	–	–	–	–	–	–
Total	–	492.20	474.10	140.0	140.0	170	286	17	–	297.00	354.00	34.00	685.00	308.00	–	–	–	79.00	1,072.00

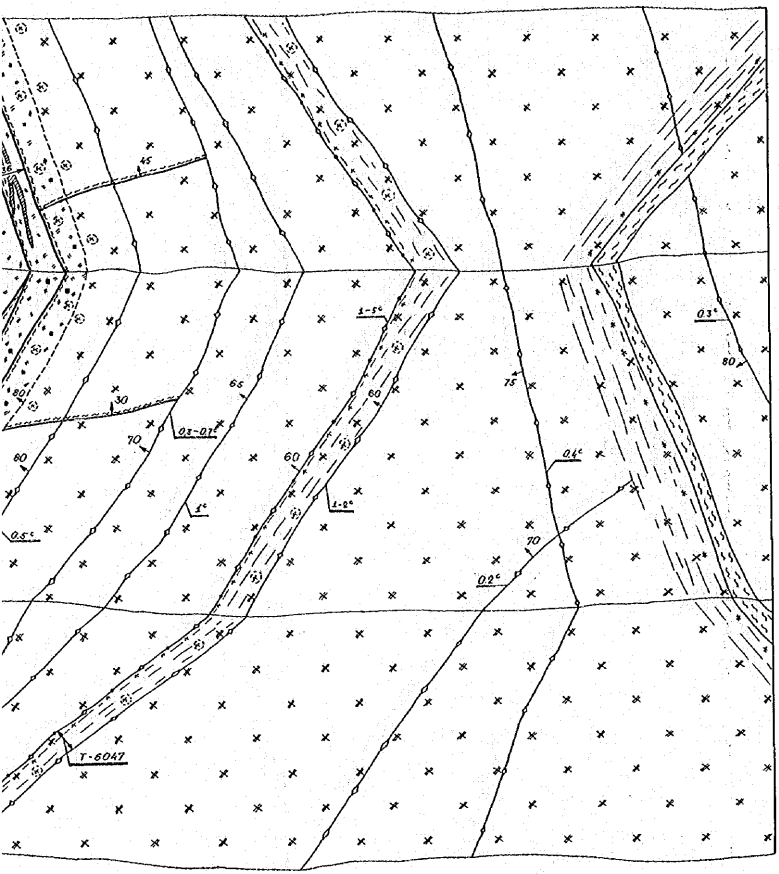
Apx. 8–2 Each Work progressive efficiency of Drilling

Item	Specification	Quantity	Note
Light oil		13,780 l	
Single Core tube	96mm×0.5m	1 PC	
〃	66mm×0.5m	1 PC	
Double Core tube	76mm×1.5m	1 PC	NS76-55
WL Core tube	NQ×1.50m	1 PC	
〃	BQ×1.50m	1 PC	
Outer tube	NQ×1.50m	1 PC	
	BQ×1.50m	1 PC	
Inner tube	NQ×1.50m	1 PC	
	BQ×1.50m	2 PC	
Guide pipe	NQ	1 PC	
Guide coupling	NQ	1 PC	
Core lifter case	NQ	17 PC	
〃	BQ	5 PC	
Core lifter	NQ	17 PC	
〃	BQ	5 PC	
W-Swivel packing	C type	20 PC	
W-Swivel spindle	C type	1 PC	
Piston rod	MG-15h	1 PC	
Piston rubber	MG-15h	2 PC	
V-Packing	MG-15h	18 PC	
Piston Assy	MG-5h	1 PC	
Cylinder liner	MG-5h	1 PC	
V-Packing	MG-5h	16 PC	
Rod	NQ×3.0m	2 PC	
〃	NQ×1.5m	1 PC	
〃	BQ×1.5m	2 PC	
Casing	NW×1.5m	8 PC	
Wire rope	8mm×200m	1 Roll	
Core box	96mm	12 PC	
〃	NQ	72 PC	
〃	BQ	12 PC	
Diamond bits	96mm	1 PC	
〃	76mm	1 PC	
〃	66mm	1 PC	
〃	NQ	14 PC	
〃	BQ	2 PC	
Diamondo reamer	NQ	3 PC	
〃	BQ	1 PC	
Pilot bit	66mm×NQ	1 PC	

Apx. 9 Item of Consumtive Materials of Drilling

Apx. 10 Location Map of the Tunnel Samples


T-4046
10°
T-6041
T-6040
T-6037
T-6036
45
80
75
70
0.5°
0.5-3°
0.3-0.7°
2-5мм
30
0.3-0.7°
65
60
1°
1-2°
1-5°
0.5°
T-6045
T-6044
T-6043
T-6042
T-6039
T-6038
T-6048
T-6047

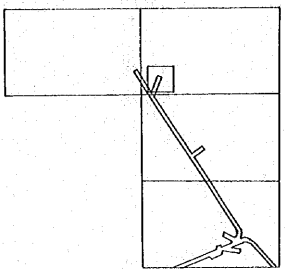


Apx 10

Location Map of the Tunnel Samples

0 1 2 3m

Locality Map of the No.5 Waste Pit



LEGEND

- Granodiorite
- Pb Zn Ore
- Vein quartz +Pb
- Silicified
- Argillized
- Veinlet with carbonate
- Veinlet with quartz
- Breccia
- Kaolinite
- Limonite
- Sericite
- Pyrite
- Joint
- Joint with clay
- Strike & dip

Apx. 11 Assay Results of the Tunnel Samples

Assay Result of the Tunnel Sample

Sample No.	Locality Tunnel,	Dist	Length (m)	Assay Au(g/t)	Ag(g/t)	Pb(%)	Zn(%)	Cu(%)	Remarks
T-6046	CCr	31.70	0.20	<0.1	<0.1	0.05	0.22	<0.01	
T-6041	CCr	23.10	1.15	<0.1	<0.1	0.52	1.38	0.01	arg, chl mix zone
T-6040	CCr	22.30	0.80	0.3	67.1	9.75	2.90	0.11	beresite
T-6037	CCr	21.60	0.70	0.7	188.4	15.78	12.57	0.42	gn, sp ore
T-6036	CCr	19.80	0.80	0.5	<0.1	0.65	1.70	0.02	beresite
T-6045	CCl	29.30	0.80	<0.1	<0.1	0.07	1.31	<0.01	granodiorite
T-6044	CCl	28.30	1.00	<0.1	<0.1	0.24	1.72	<0.01	arg, kao
T-6043	CCl	27.20	1.10	0.3	<0.1	2.92	4.28	0.03	argilize
T-6042	CCl	26.00	1.10	0.2	<0.1	0.76	2.32	0.04	beresite ore
T-6039	CCl	25.05	0.80	5.4	301.4	27.20	21.36	0.30	sp, gn ore
T-6038	CCl	24.35	0.70	0.4	44.3	4.94	2.60	0.11	beresite
T-6048	CCl	23.85	0.50	<0.1	<0.1	0.02	2.56	<0.01	kaoline vein
T-6047	CCl	20.00	0.40	<0.1	<0.1	0.06	0.22	0.01	quartz, carbonate
T-6049	NDr	124.0	1.00	<0.1	<0.1	0.02	0.21	<0.01	sheared zone
T-6050	NDl	135.5	0.35	<0.1	<0.1	0.04	0.06	<0.01	clay vein
T-6051	NDr	153.5	0.55	<0.1	<0.1	0.01	0.04	<0.01	clay vein
T-6052	NDr	162.0	0.30	<0.1	<0.1	0.01	0.04	<0.01	clay vein
T-6053	NDr	177.0	0.40	<0.1	<0.1	0.01	0.02	<0.01	carbonate vein
T-6054	NDl	187.0	1.60	<0.1	<0.1	0.02	0.02	<0.01	kaoline vein
T-6055	NDr	224.0	0.40	<0.1	<0.1	<0.01	0.02	<0.01	carbonate v with gr-dio

Apx. 12 Core Loggings

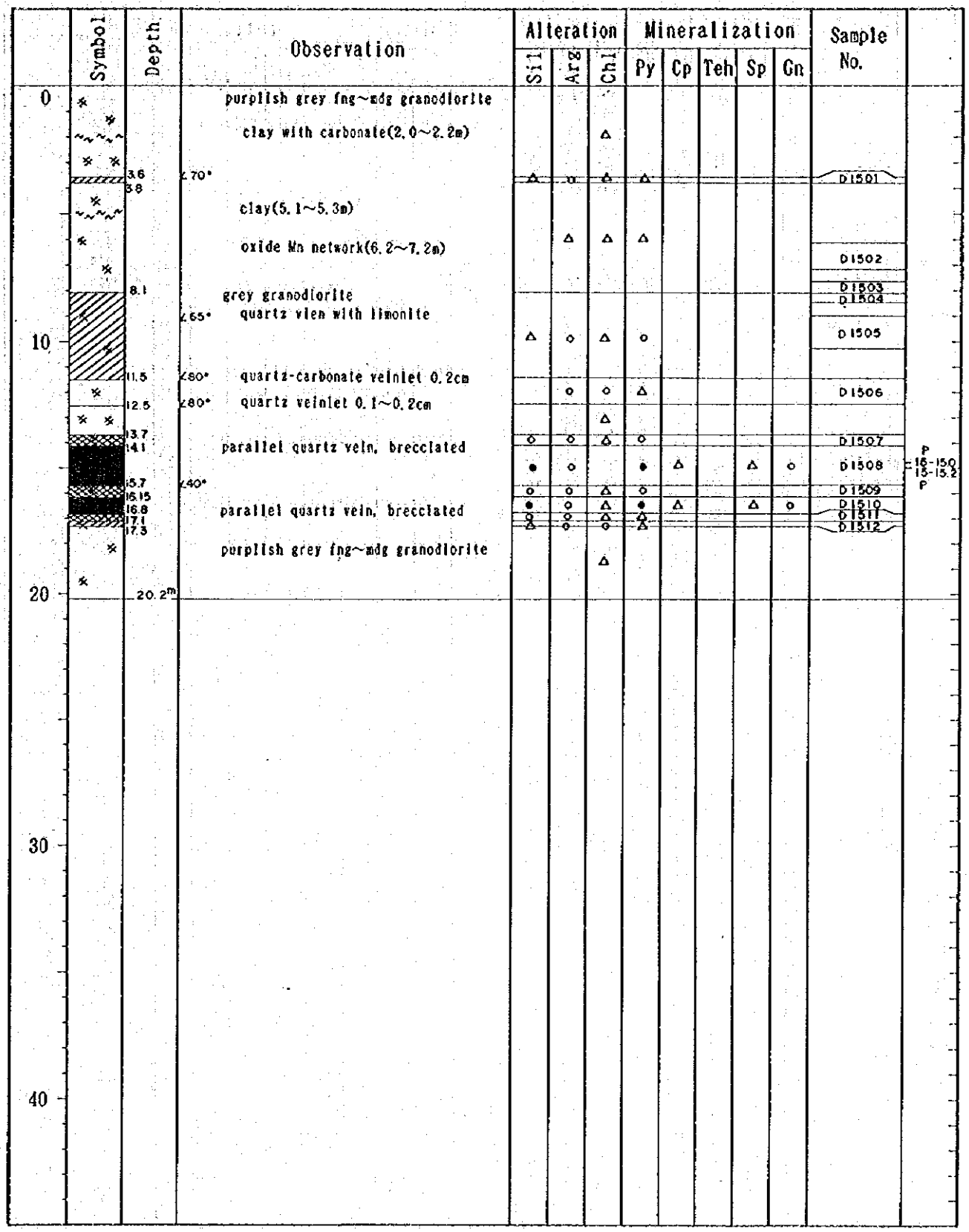
Legend

granodiorite	clay
andesite	most abundant
quartz vein	moderately abundant
strong silicified zone	less abundant
quartz network zone	

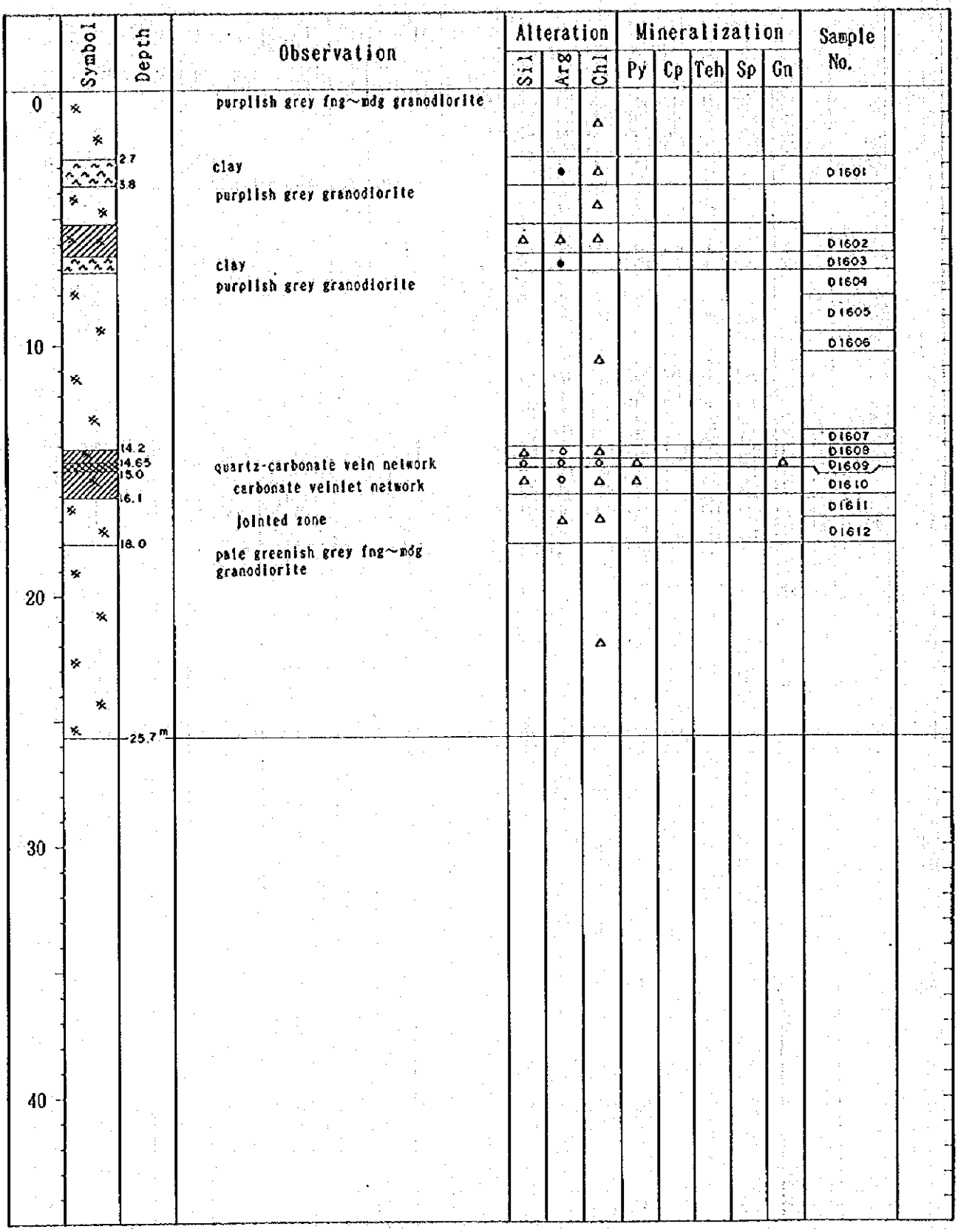
Abbreviations

· Arg	:	argillized	· mdg	:	medium grained
· Chl	:	chlorite	· Py	:	pyrite
· Cp	:	chalcopyrite	· Qtz	:	quartz
· csg	:	coarse grained	· Sil	:	silicification
· fng	:	fine grained	· Sp	:	sphalerite
· Gn	:	galena	· st	:	strong

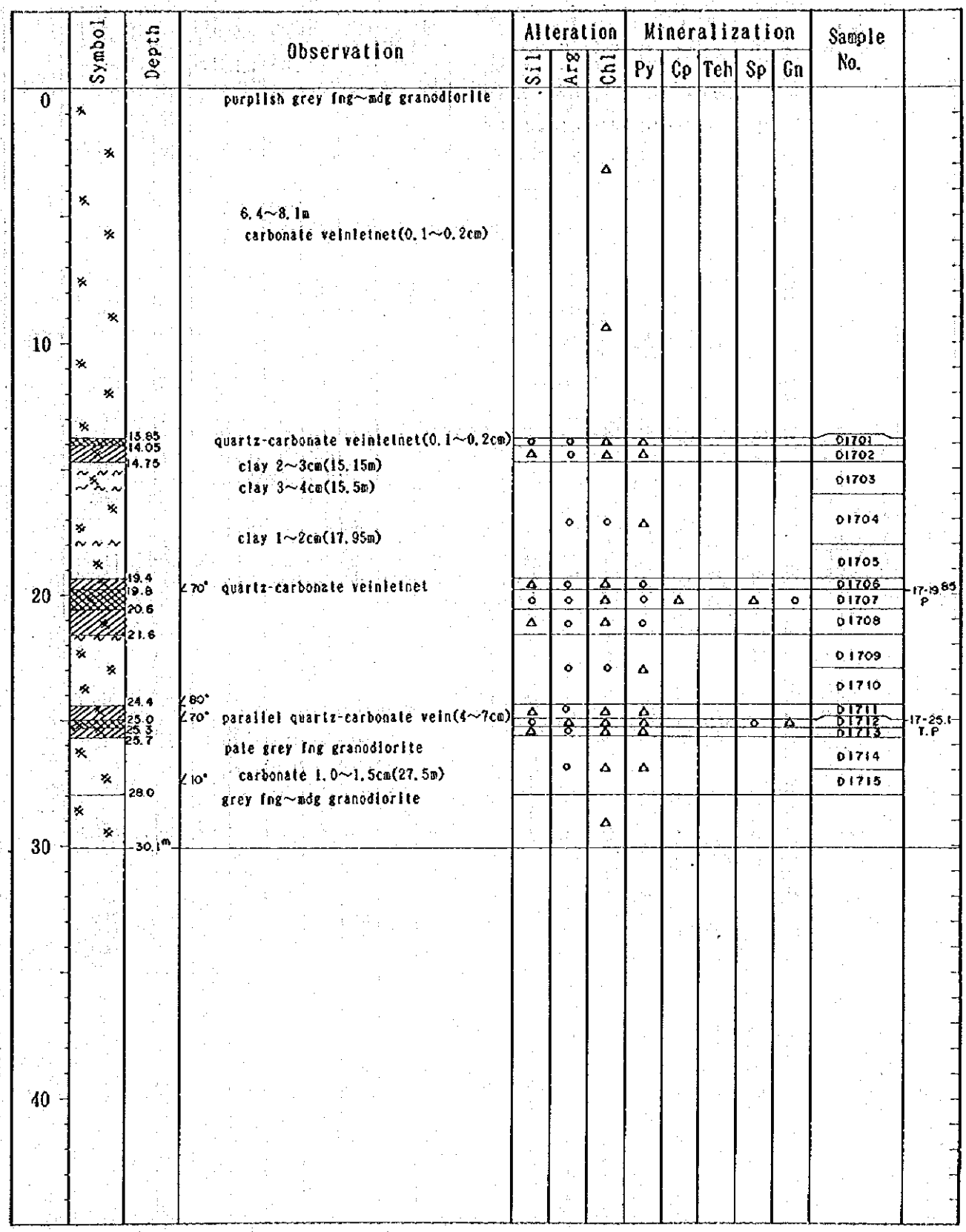
95MJMT-15


Symbol
Depth
Observation
Alteration
Sil
Arg
Chl
Mineralization
Py
Cp
Teh
Sp
Gn
Sample No.
purplish grey fng~mdg granodiorite
clay with carbonate(2.0~2.2m)
clay(5.1~5.3m)
oxide Mn network(6.2~7.2m)
grey granodiorite
quartz vien with limonite
quartz-carbonate veinlet 0.2cm
quartz veinlet 0.1~0.2cm
parallel quartz vein, brecciated
parallel quartz vein, brecciated
purplish grey fng~mdg granodiorite
3.6
3.8
8.1
11.5
12.5
13.7
14.1
15.7
15.15
16.8
17.1
17.3
20.2m
70°
65°
80°
80°
40°
D1501
D1502
D1503
D1504
D1505
D1506
D1507
D1508
D1509
D1510
D1511
D1512
P
16-150
15-15.2
P
0
10
20
30
40

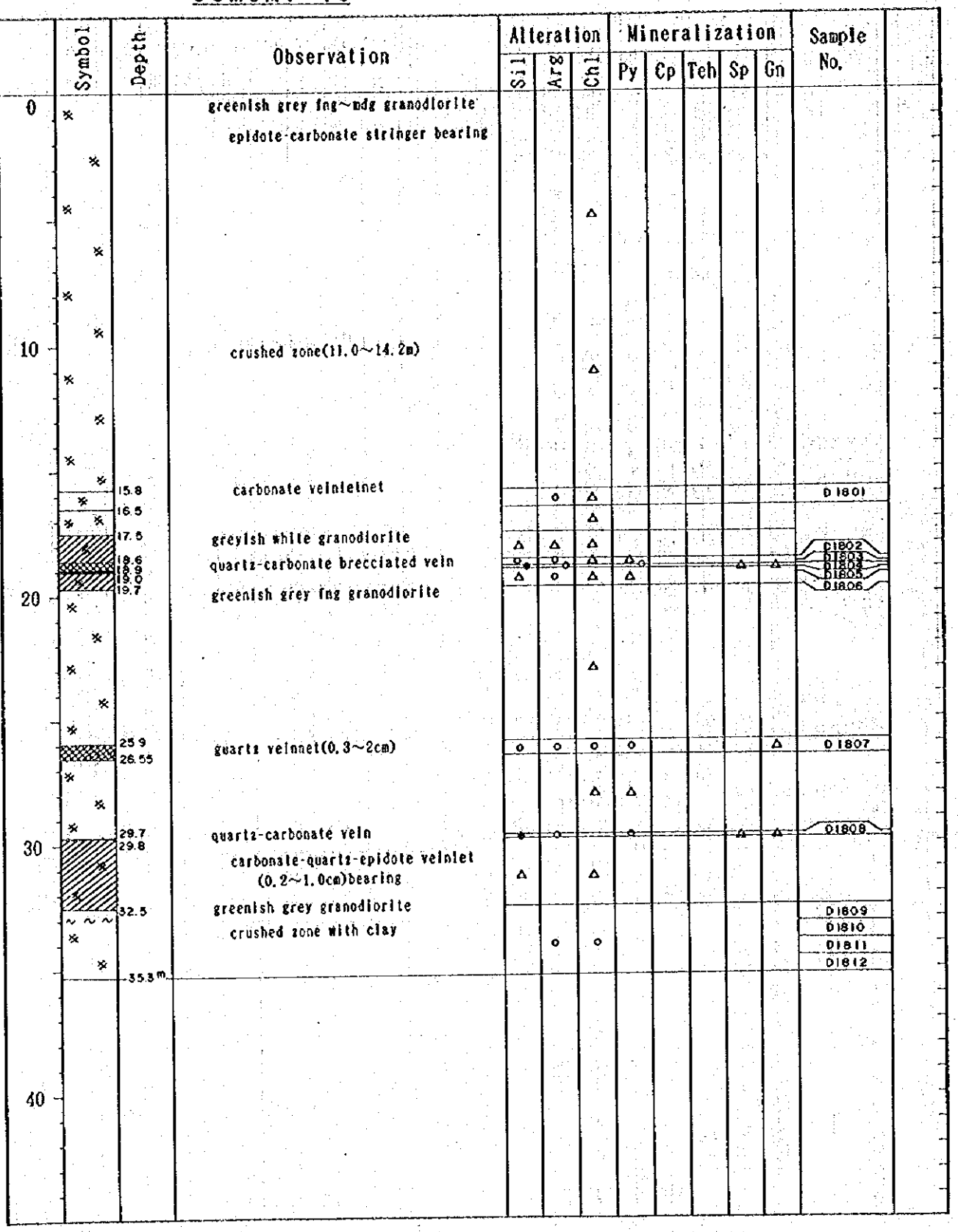
95MJMT-16


Symbol
Depth
Observation
Alteration
Sil
Arg
Chl
Mineralization
Py
Cp
Teh
Sp
Gn
Sample No.
purplish grey fng~mdg granodiorite
2.7
clay
3.8
purplish grey granodiorite
clay
purplish grey granodiorite
14.2
14.65
15.0
16.1
quartz-carbonate vein network
carbonate veinlet network
jointed zone
18.0
pale greenish grey fng~mdg granodiorite
25.7m
D1601
D1602
D1603
D1604
D1605
D1606
D1607
D1608
D1609
D1610
D1611
D1612
0
10
20
30
40

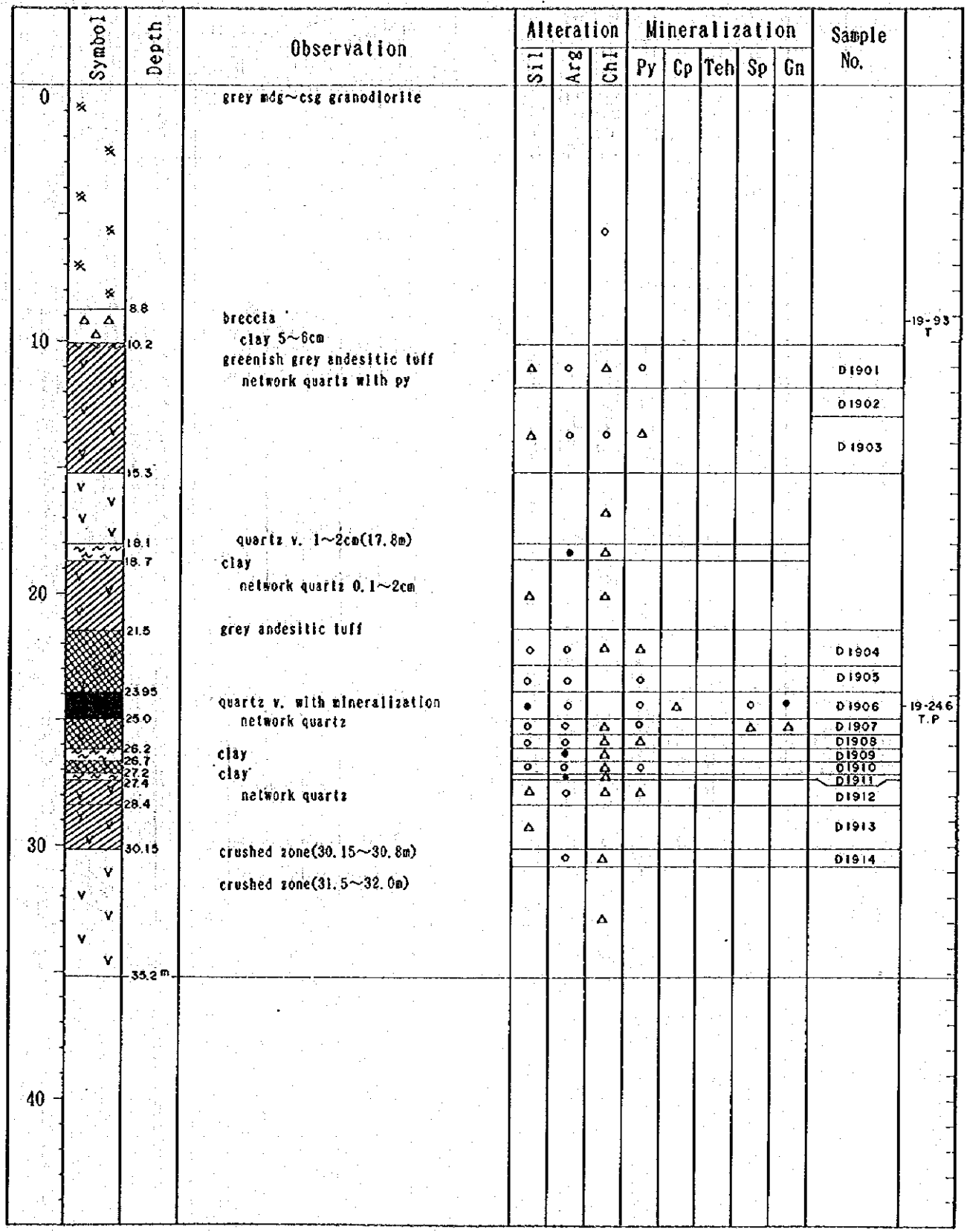
95MJMT-17


Symbol
Depth
Observation
Alteration
Sil
Arg
Chl
Mineralization
Py
Cp
Teh
Sp
Gn
Sample No.
purplish grey fng~mdg granodiorite
6.4~8.1m
carbonate veinletnet(0.1~0.2cm)
quartz-carbonate veinletnet(0.1~0.2cm)
clay 2~3cm(15.15m)
clay 3~4cm(15.5m)
clay 1~2cm(17.95m)
∠70° quartz-carbonate veinletnet
∠80°
∠70° parallel quartz-carbonate vein(4~7cm)
pale grey fng granodiorite
∠10° carbonate 1.0~1.5cm(27.5m)
grey fng~mdg granodiorite
15.65
14.05
14.75
19.4
19.8
20.6
21.6
24.4
25.0
25.3
25.7
28.0
30.1m
01701
01702
01703
01704
01705
01706
01707
01708
01709
01710
01711
01712
01713
01714
01715
17-19.85 P
17-25.1 T.P

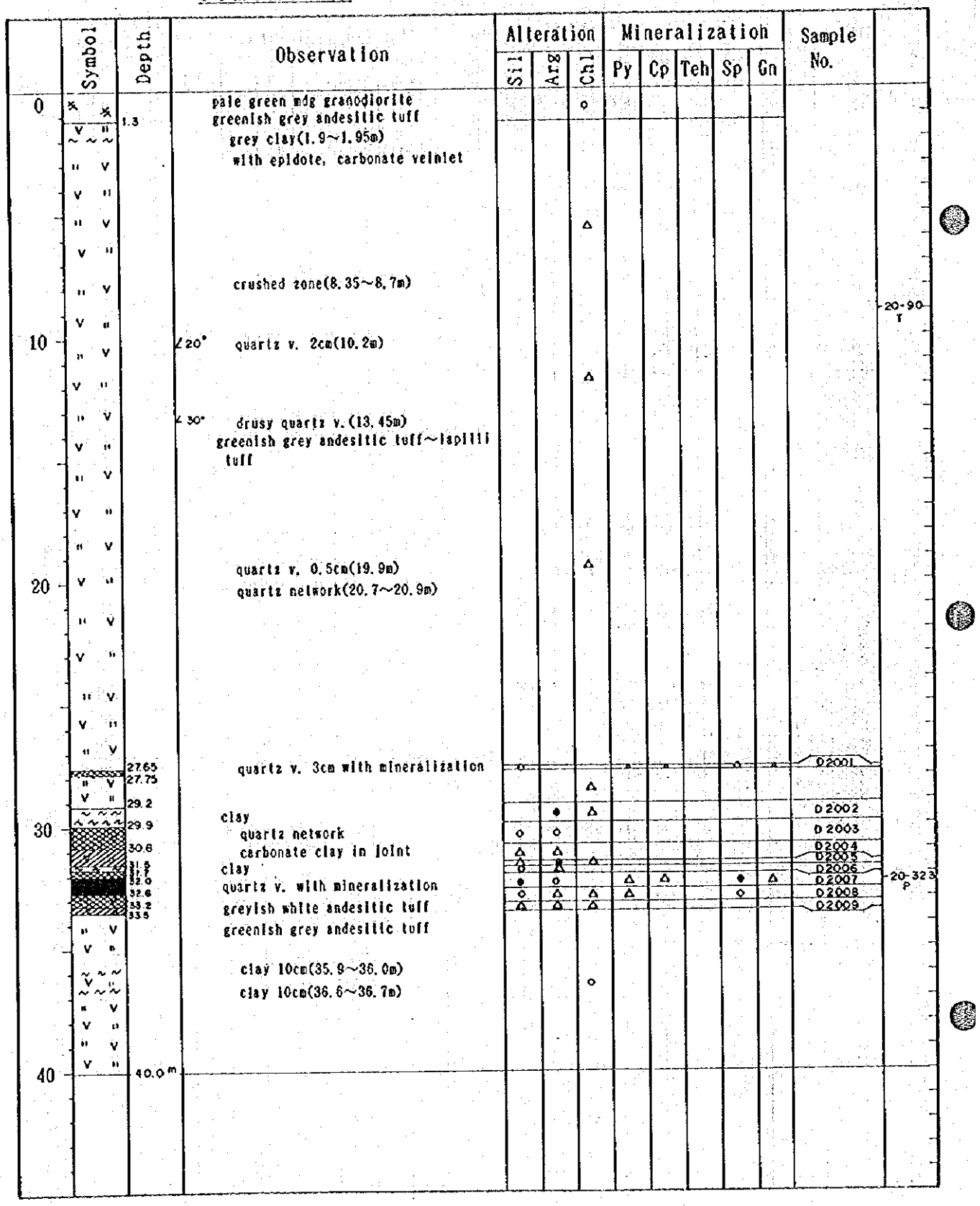
95MJMT-18


Symbol
Depth
Observation
Alteration
Sil
Arg
Chl
Mineralization
Py
Cp
Teh
Sp
Gn
Sample No.
0
10
20
30
40
greenish grey fng~mdg granodiorite
epidote-carbonate stringer bearing
crushed zone(11.0~14.2m)
carbonate veinletnet
15.8
16.5
17.5
18.6
19.0
19.7
greyish white granodiorite
quartz-carbonate brecciated vein
greenish grey fng granodiorite
25.9
26.55
quartz veinnet(0.3~2cm)
29.7
29.8
32.5
quartz-carbonate vein
carbonate-quartz-epidote veinlet (0.2~1.0cm)bearing
greenish grey granodiorite
crushed zone with clay
35.3m
D1801
D1802
D1803
D1804
D1805
D1806
D1807
D1808
D1809
D1810
D1811
D1812

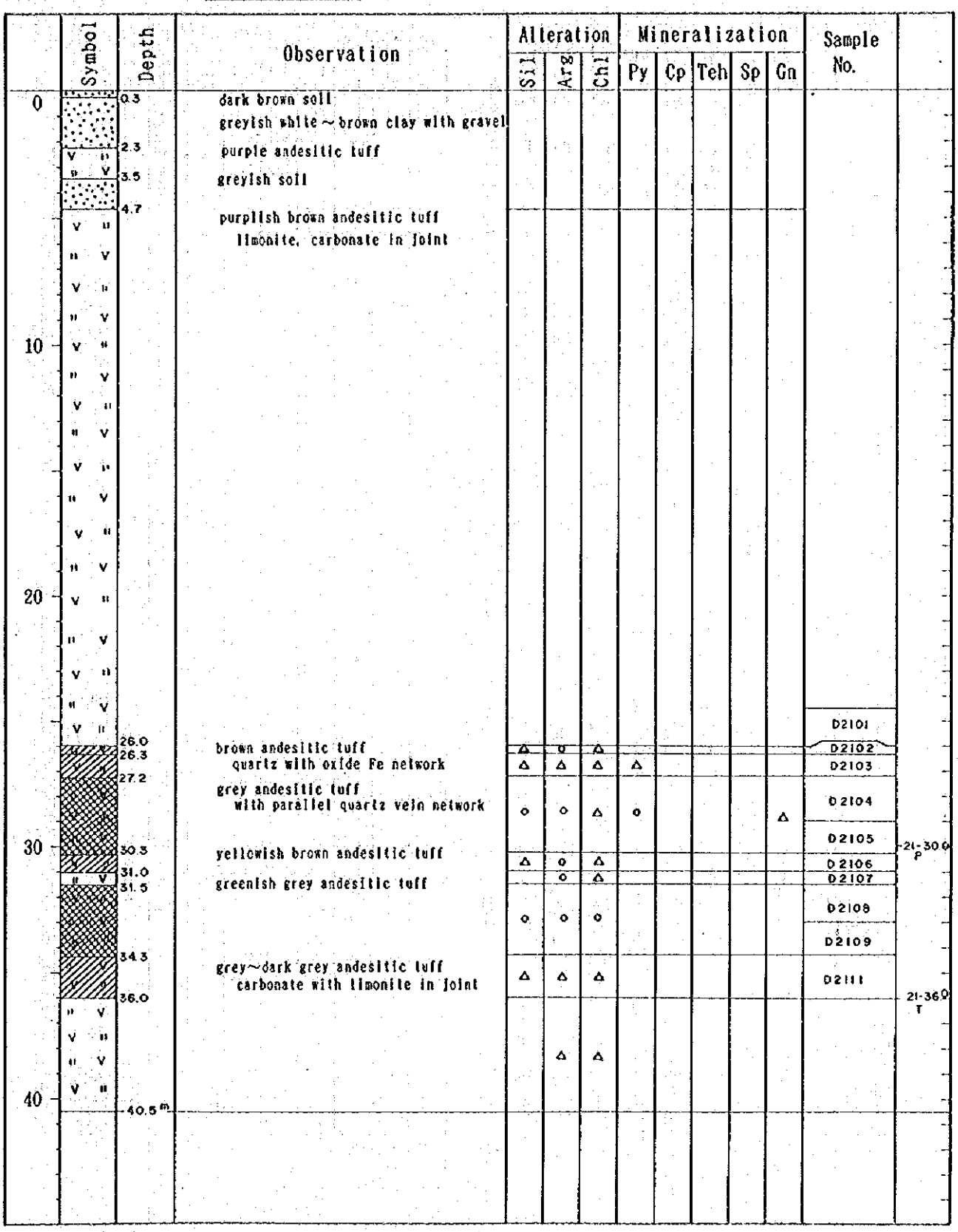
95MJMT-19


Symbol
Depth
Observation
Alteration
Sil
Arg
Chl
Mineralization
Py
Cp
Teh
Sp
Gn
Sample No.
0
10
20
30
40
8.8
10.2
15.3
18.1
18.7
21.5
23.95
25.0
26.2
26.7
27.2
27.4
28.4
30.15
35.2 m
grey mdg~csg granodiorite
breccia
clay 5~6cm
greenish grey andesitic tuff
network quartz with py
quartz v. 1~2cm(17.8m)
clay
network quartz 0.1~2cm
grey andesitic tuff
quartz v. with mineralization
network quartz
clay
clay
network quartz
crushed zone(30.15~30.8m)
crushed zone(31.5~32.0m)
D1901
D1902
D1903
D1904
D1905
D1906
D1907
D1908
D1909
D1910
D1911
D1912
D1913
D1914
19-93 T
19-246 T.P

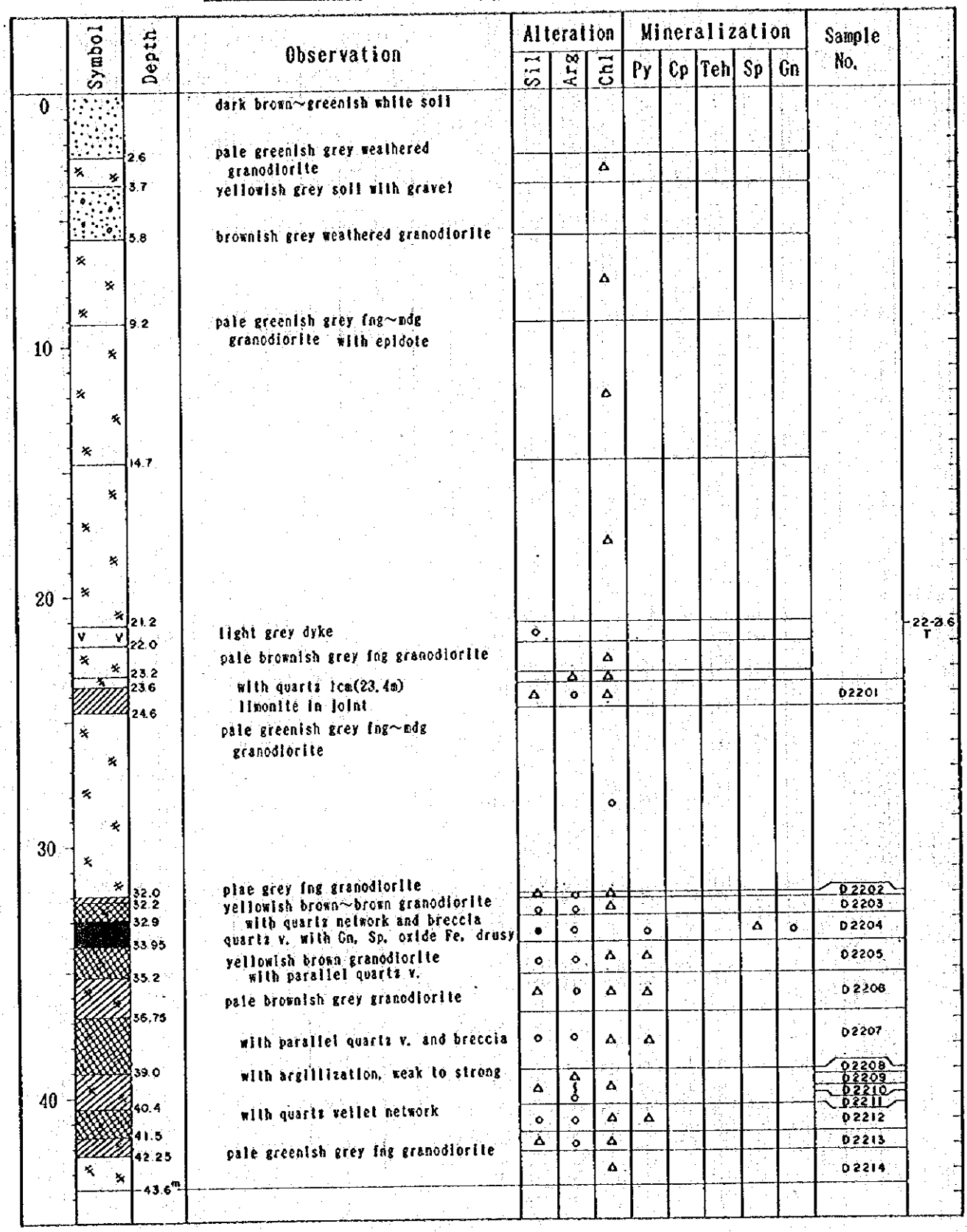
95MJMT-20


Symbol
Depth
Observation
Alteration
Sil
Arg
Chl
Mineralization
Py
Cp
Teh
Sp
Gn
Sample No.
0
10
20
30
40
1.3
pale green mdg granodiorite
greenish grey andesitic tuff
grey clay(1.9~1.95m)
with epidote, carbonate veinlet
crushed zone(8.35~8.7m)
∠20°
quartz v. 2cm(10.2m)
∠30°
drusy quartz v.(13.45m)
greenish grey andesitic tuff~lapilli tuff
quartz v. 0.5cm(19.9m)
quartz network(20.7~20.9m)
27.65
27.75
quartz v. 3cm with mineralization
29.2
29.9
clay
quartz network
30.6
carbonate clay in joint
31.5
clay
32.0
quartz v. with mineralization
32.6
33.2
greyish white andesitic tuff
33.5
greenish grey andesitic tuff
clay 10cm(35.9~36.0m)
clay 10cm(36.6~36.7m)
40.0m
D2001
D2002
D2003
D2004
D2005
D2006
D2007
D2008
D2009
20-90 T
20-323 P

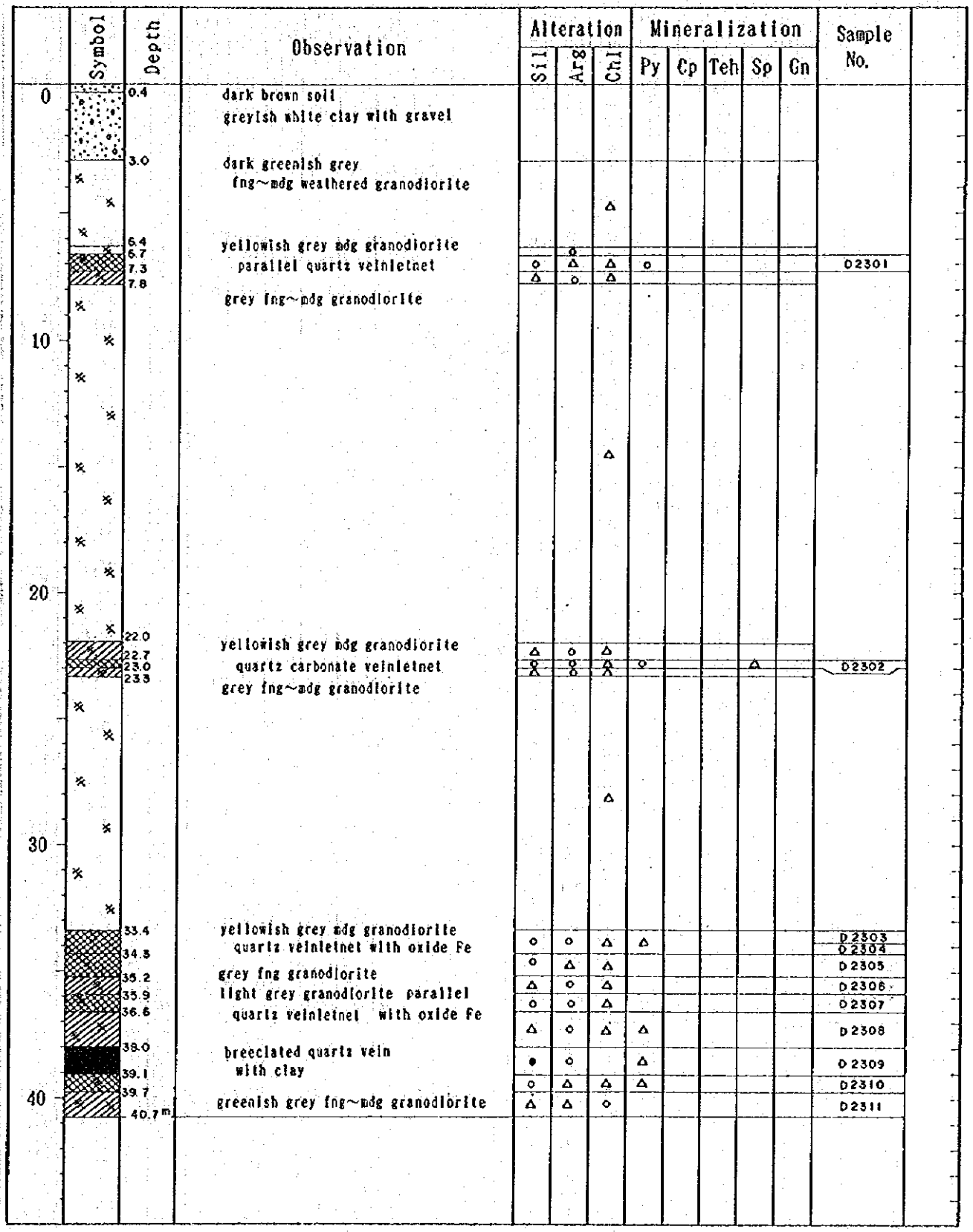
95MJMT-21


Symbol
Depth
Observation
Alteration
Sil
Arg
Chl
Mineralization
Py
Cp
Teh
Sp
Gn
Sample No.
0
10
20
30
40
0.3
2.3
3.5
4.7
26.0
26.3
27.2
30.3
31.0
31.5
34.3
36.0
40.5m
dark brown soil
greyish white ~ brown clay with gravel
purple andesitic tuff
greyish soil
purplish brown andesitic tuff
limonite, carbonate in joint
brown andesitic tuff
quartz with oxide Fe network
grey andesitic tuff
with parallel quartz vein network
yellowish brown andesitic tuff
greenish grey andesitic tuff
grey~dark grey andesitic tuff
carbonate with limonite in joint
D2101
D2102
D2103
D2104
D2105
D2106
D2107
D2108
D2109
D2111
21-30.0 P
21-36.0 T

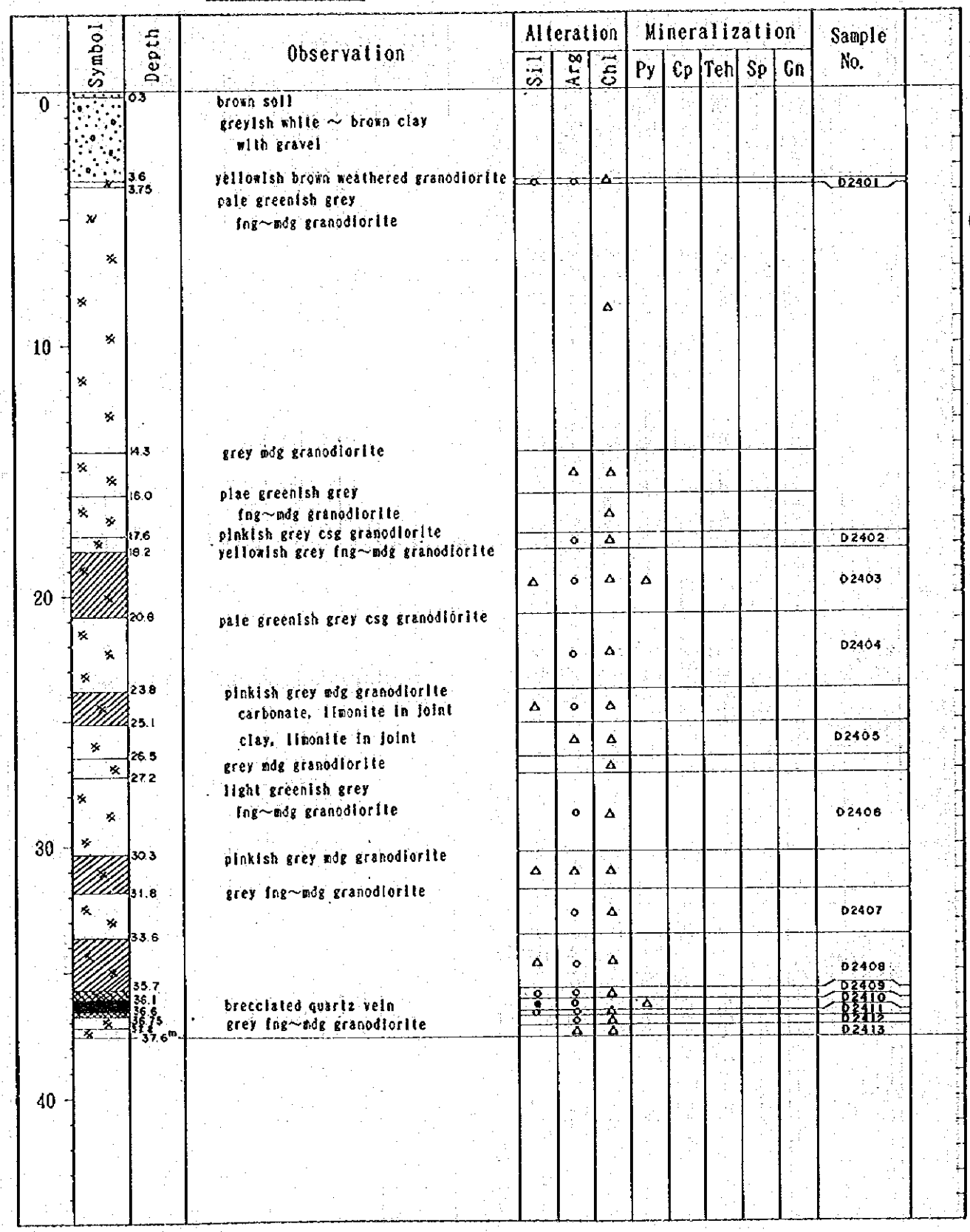
95MJMT-22


Symbol
Depth
Observation
Alteration
Sil
Arg
Chl
Mineralization
Py
Cp
Teh
Sp
Gn
Sample No.
0
10
20
30
40
2.6
3.7
5.8
9.2
14.7
21.2
22.0
23.2
23.6
24.6
32.0
32.2
32.9
33.95
35.2
36.75
39.0
40.4
41.5
42.25
43.6m
dark brown~greenish white soil
pale greenish grey weathered granodiorite
yellowish grey soil with gravel
brownish grey weathered granodiorite
pale greenish grey fng~mdg granodiorite with epidote
light grey dyke
pale brownish grey fng granodiorite
with quartz 1cm(23.4m)
limonite in joint
pale greenish grey fng~mdg granodiorite
pale grey fng granodiorite
yellowish brown~brown granodiorite
with quartz network and breccia
quartz v. with Cp, Sp, oxide Fe, drusy
yellowish brown granodiorite
with parallel quartz v.
pale brownish grey granodiorite
with parallel quartz v. and breccia
with argillization, weak to strong
with quartz veilet network
pale greenish grey fng granodiorite
D2201
D2202
D2203
D2204
D2205
D2206
D2207
D2208
D2209
D2210
D2211
D2212
D2213
D2214
22-26 T

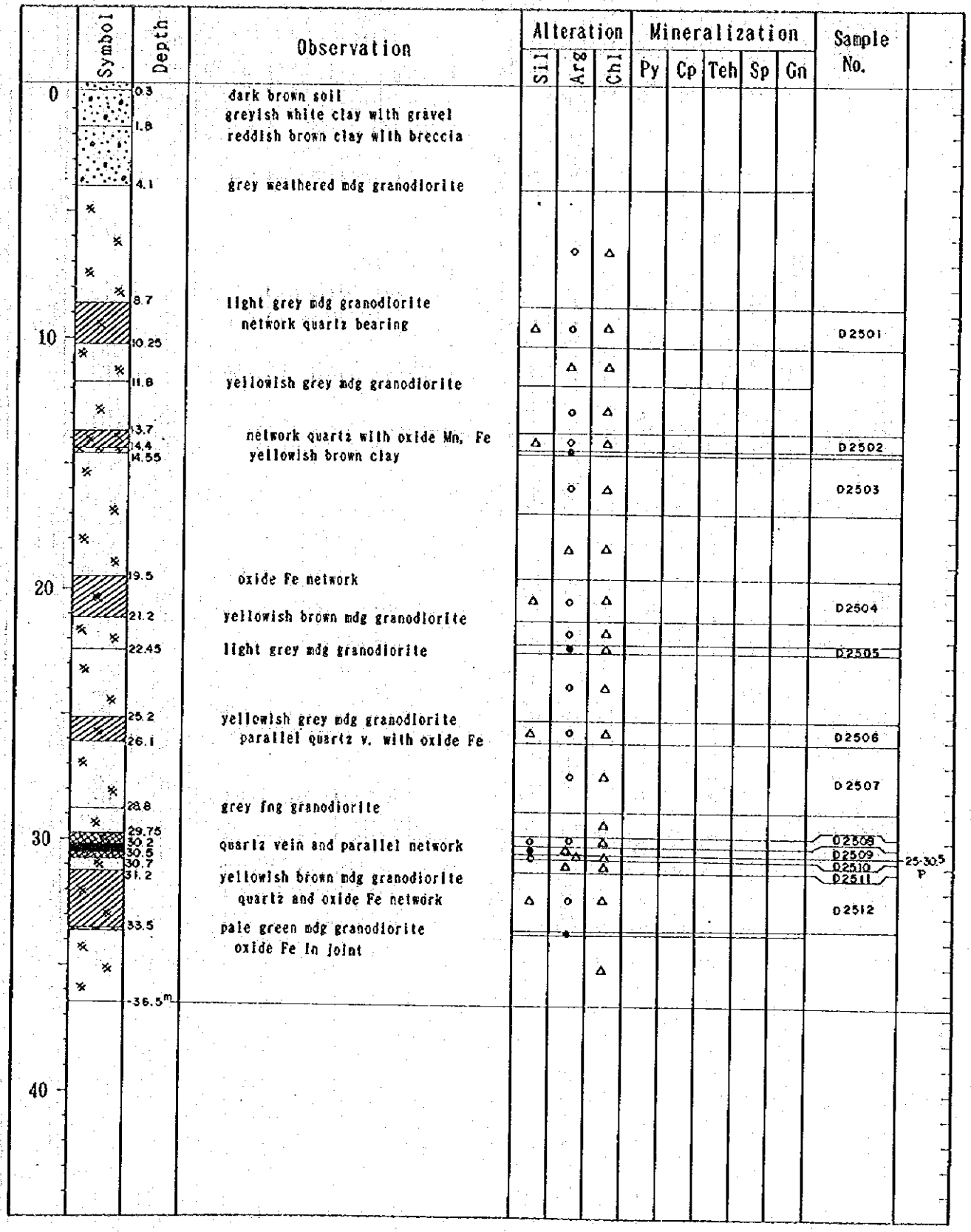
95MJMT-23


Symbol
Depth
Observation
Alteration
Sil
Arg
Chl
Mineralization
Py
Cp
Teh
Sp
Gn
Sample No.
0
10
20
30
40
0.4
3.0
6.4
6.7
7.3
7.8
22.0
22.7
23.0
23.3
33.4
34.3
35.2
35.9
36.6
38.0
39.1
39.7
40.7m
dark brown soil
greyish white clay with gravel
dark greenish grey
fng~mdg weathered granodiorite
yellowish grey mdg granodiorite
parallel quartz veinletnet
D2301
grey fng~mdg granodiorite
yellowish grey mdg granodiorite
quartz carbonate veinletnet
D2302
grey fng~mdg granodiorite
yellowish grey mdg granodiorite
quartz veinletnet with oxide Fe
D2303
D2304
D2305
grey fng granodiorite
light grey granodiorite parallel
quartz veinletnet with oxide Fe
D2306
D2307
D2308
breeciated quartz vein
with clay
D2309
D2310
greenish grey fng~mdg granodiorite
D2311

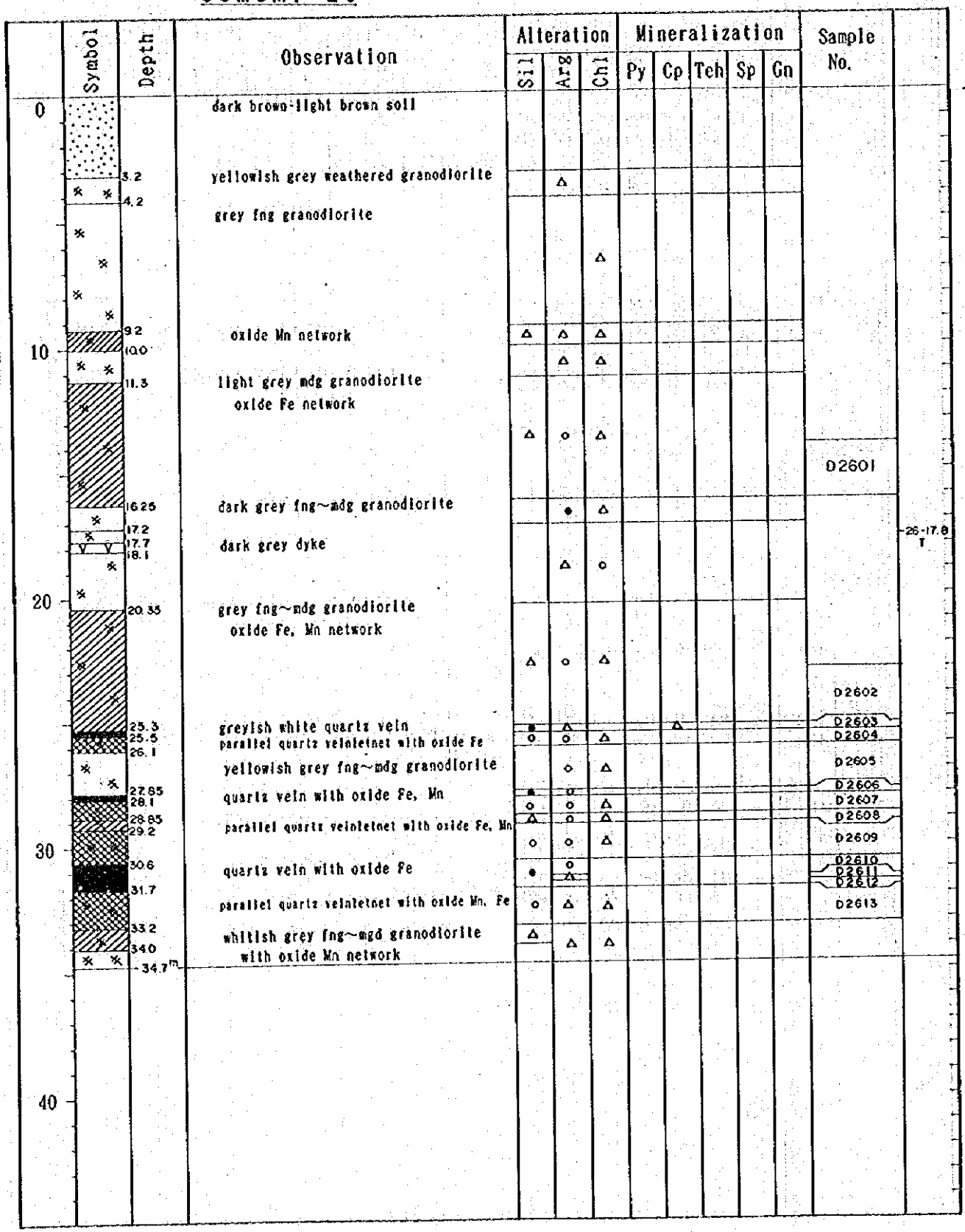
95MJMT-24


Symbol
Depth
Observation
Alteration
Sil
Arg
Chl
Mineralization
Py
Cp
Teh
Sp
Gn
Sample No.
0
10
20
30
40
0.3
brown soil
greyish white ~ brown clay with gravel
3.6
3.75
yellowish brown weathered granodiorite
D2401
pale greenish grey fng~mdg granodiorite
14.3
grey mdg granodiorite
16.0
plae greenish grey fng~mdg granodiorite
17.6
pinkish grey csg granodiorite
D2402
18.2
yellowish grey fng~mdg granodiorite
D2403
20.6
pale greenish grey csg granodiorite
D2404
23.8
pinkish grey mdg granodiorite
carbonate, limonite in joint
25.1
clay, limonite in joint
D2405
26.5
grey mdg granodiorite
27.2
light greenish grey fng~mdg granodiorite
D2406
30.3
pinkish grey mdg granodiorite
31.8
grey fng~mdg granodiorite
D2407
33.6
D2408
35.7
D2409
36.1
breccIated quartz vein
D2410
36.6
D2411
36.75
D2412
37.4
grey fng~mdg granodiorite
D2413
37.6m

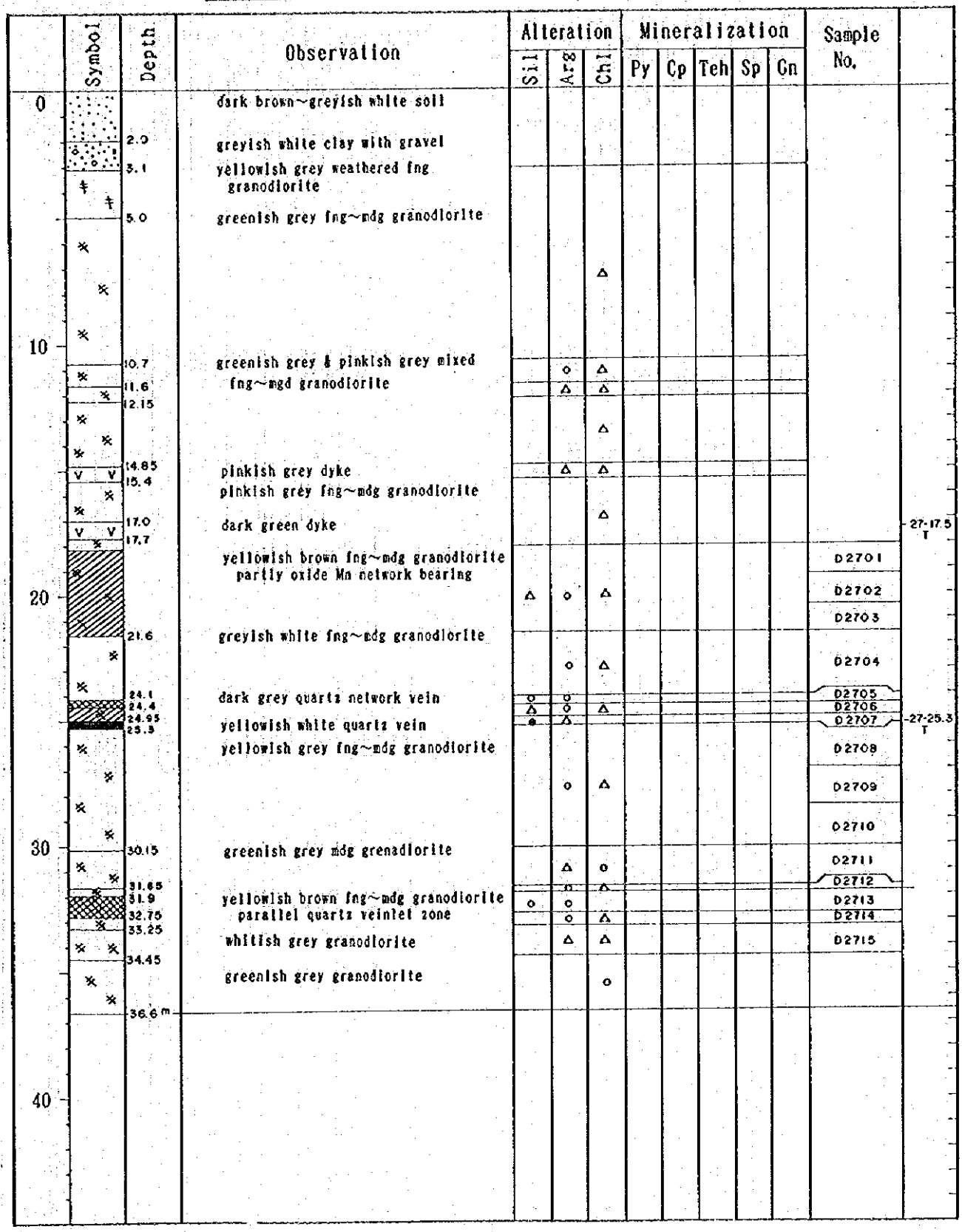
95MJMT-25


Symbol
Depth
Observation
Alteration
Sil
Arg
Chl
Mineralization
Py
Cp
Teh
Sp
Gn
Sample No.
0
10
20
30
40
0.3
1.8
4.1
8.7
10.25
11.8
13.7
14.4
14.55
19.5
21.2
22.45
25.2
26.1
28.8
29.75
30.2
30.5
30.7
31.2
33.5
36.5m
dark brown soil
greyish white clay with gravel
reddish brown clay with breccia
grey weathered mdg granodiorite
light grey mdg granodiorite
network quartz bearing
yellowish grey mdg granodiorite
network quartz with oxide Mn, Fe
yellowish brown clay
oxide Fe network
yellowish brown mdg granodiorite
light grey mdg granodiorite
yellowish grey mdg granodiorite
parallel quartz v. with oxide Fe
grey fng granodiorite
quartz vein and parallel network
yellowish brown mdg granodiorite
quartz and oxide Fe network
pale green mdg granodiorite
oxide Fe in joint
D2501
D2502
D2503
D2504
D2505
D2506
D2507
D2508
D2509
D2510
D2511
D2512
25-30.5 P

95MJMT-26


Symbol
Depth
Observation
Alteration
Sil
Arg
Chl
Mineralization
Py
Cp
Teh
Sp
Gn
Sample No.
0
10
20
30
40
3.2
4.2
9.2
10.0
11.3
16.25
17.2
17.7
18.1
20.35
25.3
25.5
26.1
27.85
28.1
28.85
29.2
30.6
31.7
33.2
34.0
34.7m
dark brown-light brown soil
yellowish grey weathered granodiorite
grey fng granodiorite
oxide Mn network
light grey mdg granodiorite
oxide Fe network
dark grey fng~mdg granodiorite
dark grey dyke
grey fng~mdg granodiorite
oxide Fe, Mn network
greyish white quartz vein
parallel quartz veinletnet with oxide Fe
yellowish grey fng~mdg granodiorite
quartz vein with oxide Fe, Mn
parallel quartz veinletnet with oxide Fe, Mn
quartz vein with oxide Fe
parallel quartz veinletnet with oxide Mn, Fe
whitish grey fng~mgd granodiorite
with oxide Mn network
D2601
D2602
D2603
D2604
D2605
D2606
D2607
D2608
D2609
D2610
D2611
D2612
D2613
26-17.8 T

95MJMT-27


Symbol
Depth
Observation
Alteration
Sil
Arg
Chl
Mineralization
Py
Cp
Teh
Sp
Gn
Sample No.
0
10
20
30
40
2.0
3.1
5.0
10.7
11.6
12.15
14.85
15.4
17.0
17.7
21.6
24.1
24.4
24.95
25.3
30.15
31.65
31.9
32.75
33.25
34.45
36.6 m
dark brown~greyish white soil
greyish white clay with gravel
yellowish grey weathered fng granodiorite
greenish grey fng~mdg granodiorite
greenish grey & pinkish grey mixed fng~mgd granodiorite
pinkish grey dyke
pinkish grey fng~mdg granodiorite
dark green dyke
yellowish brown fng~mdg granodiorite partly oxide Mn network bearing
greyish white fng~mdg granodiorite
dark grey quartz network vein
yellowish white quartz vein
yellowish grey fng~mdg granodiorite
greenish grey mdg grenadiorite
yellowish brown fng~mdg granodiorite parallel quartz veinlet zone
whitish grey granodiorite
greenish grey granodiorite
D2701
D2702
D2703
D2704
D2705
D2706
D2707
D2708
D2709
D2710
D2711
D2712
D2713
D2714
D2715
27-17.5 T
27-25.3 T

95MJMT-28

Depth	Observation	Alteration			Mineralization					Sample No.
		Sil	Arg	Chl	Py	Cp	Teh	Sp	Gn	
0	dark brown soil									
1.0	yellowish white clay with gravel									
1.8	greenish grey~white fng~mdg granodiorite			△						
5.9	yellowish grey mdg granodiorite		◆	△						
6.5			○	△						
7.6				△						
8.6	light grey fng~mdg granodiorite with network quartz	△	△	△						
11.0	dark~pinkish grey fng~mdg granodiorite epidote in joint		△							
13.85	yellowish grey fng~mdg granodiorite	△	○	△						
14.3	pinkish grey fng~mdg granodiorite		△							
17.35	yellowish grey fng~mdg granodiorite									
19.5	quartz network with oxide Mn, Fe	△	◇	△						D 2801
20.6	grey fng~mdg granodiorite									
22.3			△	△						
24.5	oxide Mn network	△	△	△						D2802
25.6	greyish white fng granodiorite	△	○	△						D2803
28.1	quartz vein	○	◇							D2804
28.9 / 26.75		●	◇						△	D2805
26.9		◇	◇							D2806
			○	*						D2607
28.0	pale greenish grey granodiorite		○	△						D2808
29.15	carbonate network	△	△	△						D2809
30.1		△	○	△						D2810
	pinkish grey fng~mdg granodiorite carbnate, ep in joint			△						
35.5m										
40										

Apx. 13 Assay Results of the Drilling Samples

Assay Result of the Drilling Sample (1)

Hole No.	Sample No.	Locality from	to	Int. (m)	Assay Au(g/t)	Ag(g/t)	Pb(%)	Zn(%)	Cu(%)	Remarks
MJMT-15	D 1501	3.60 -	3.80	0.20	<0.1	16.4	0.07	0.11	0.01	
	D 1502	6.20 -	7.20	1.00	<0.1	<0.1	0.01	0.06	<0.01	
	D 1503	7.70 -	8.10	0.40	<0.1	2.8	0.01	0.09	<0.01	
	D 1504	8.10 -	8.40	0.30	<0.1	<0.1	0.01	0.17	<0.01	
	D 1505	9.00 -	10.30	1.30	<0.1	16.0	0.04	0.31	<0.01	
	D 1506	11.50 -	12.50	1.00	<0.1	0.9	0.01	0.24	<0.01	
	D 1507	13.70 -	14.10	0.40	<0.1	<0.1	0.05	1.08	<0.01	
	D 1508	14.10 -	15.70	1.60	0.3	132.0	13.31	6.49	0.07	
	D 1509	15.70 -	16.15	0.45	<0.1	22.5	2.09	0.87	0.01	
	D 1510	16.15 -	16.80	0.65	0.6	34.0	1.41	4.56	0.24	
	D 1511	16.80 -	17.10	0.30	<0.1	12.2	0.51	1.06	0.02	
	D 1512	17.10 -	17.30	0.20	<0.1	<0.1	0.17	0.64	0.01	
MJMT-16	D 1601	2.70 -	3.80	1.10	<0.1	<0.1	0.01	0.04	<0.01	
	D 1602	5.80 -	6.50	0.70	<0.1	17.8	0.01	0.02	<0.01	
	D 1603	6.50 -	7.20	0.70	<0.1	<0.1	0.04	0.06	<0.01	
	D 1604	7.20 -	8.20	1.00	<0.1	<0.1	0.01	0.07	<0.01	
	D 1605	8.20 -	9.60	1.40	<0.1	<0.1	0.01	0.03	<0.01	
	D 1606	9.60 -	10.40	0.80	<0.1	<0.1	<0.01	0.03	<0.01	
	D 1607	13.50 -	14.20	0.70	<0.1	<0.1	0.01	0.04	<0.01	
	D 1608	14.20 -	14.65	0.45	<0.1	11.7	0.02	0.12	<0.01	
	D 1609	14.65 -	15.00	0.35	<0.1	8.0	0.36	0.83	0.01	
	D 1610	15.00 -	16.10	1.10	<0.1	2.3	0.05	0.22	<0.01	
	D 1611	16.10 -	17.00	0.90	<0.1	<0.1	0.01	0.09	<0.01	
	D 1612	17.00 -	18.00	1.00	<0.1	<0.1	0.01	0.11	0.01	
MJMT-17	D 1701	13.85 -	14.05	0.20	<0.1	12.7	0.05	0.11	<0.01	
	D 1702	14.05 -	14.75	0.70	<0.1	1.9	0.04	0.02	<0.01	
	D 1703	14.75 -	16.00	1.25	<0.1	<0.1	0.01	0.03	<0.01	
	D 1704	16.00 -	18.00	2.00	<0.1	2.8	0.01	0.05	<0.01	
	D 1705	18.00 -	19.40	1.40	<0.1	<0.1	0.12	0.40	0.01	
	D 1706	19.40 -	19.80	0.40	<0.1	16.9	0.49	0.49	0.02	
	D 1707	19.80 -	20.60	0.80	4.3	23.0	3.19	2.91	0.08	
	D 1708	20.60 -	21.60	1.00	<0.1	<0.1	0.28	0.61	<0.01	
	D 1709	21.60 -	23.00	1.40	<0.1	4.2	0.02	0.06	<0.01	
	D 1710	23.00 -	24.40	1.40	<0.1	<0.1	0.02	0.06	<0.01	
	D 1711	24.40 -	25.00	0.60	<0.1	1.4	0.05	0.13	<0.01	
	D 1712	25.00 -	25.30	0.30	0.3	2.3	0.62	4.56	0.06	
	D 1713	25.30 -	25.70	0.40	<0.1	<0.1	0.19	0.41	<0.01	
	D 1714	25.70 -	27.00	1.30	<0.1	<0.1	0.02	0.06	<0.01	
	D 1715	27.00 -	28.00	1.00	<0.1	33.8	0.01	0.02	<0.01	
MJMT-18	D 1801	15.80 -	16.50	0.70	<0.1	<0.1	0.02	0.12	0.01	
	D 1802	18.60 -	18.80	0.20	<0.1	4.2	0.26	1.27	<0.01	
	D 1803	18.80 -	18.90	0.10	<0.1	<0.1	0.10	0.23	<0.01	
	D 1804	18.90 -	19.00	0.10	1.7	30.0	3.80	3.09	0.04	
	D 1805	19.00 -	19.20	0.20	<0.1	2.3	0.06	0.30	<0.01	
	D 1806	19.20 -	19.70	0.50	<0.1	<0.1	0.04	0.47	<0.01	
	D 1807	25.90 -	26.55	0.65	<0.1	<0.1	0.07	0.11	<0.01	
	D 1808	29.70 -	29.80	0.10	<0.1	<0.1	0.51	0.53	0.01	
	D 1809	32.50 -	33.20	0.70	<0.1	<0.1	0.02	0.04	<0.01	
	D 1810	33.20 -	33.90	0.70	<0.1	<0.1	0.01	0.03	<0.01	
	D 1811	33.90 -	34.60	0.70	<0.1	<0.1	0.04	0.06	0.01	
	D 1812	34.60 -	35.30	0.70	<0.1	<0.1	0.07	0.05	0.01	

Int. : Interval

Assay Result of the Drilling Sample (2)

Hole No.	Sample No.	Locality from	to	Int. (m)	Assay Au(g/t)	Ag(g/t)	Pb(%)	Zn(%)	Cu(%)	Remarks
MJMT-19	D 1901	10.20 -	11.90	1.70	<0.1	<0.1	0.03	0.09	0.01	
	D 1902	11.90 -	13.00	1.10	<0.1	<0.1	0.03	0.05	<0.01	
	D 1903	13.00 -	15.30	2.30	<0.1	<0.1	0.01	0.03	<0.01	
	D 1904	21.50 -	22.90	1.40	<0.1	<0.1	0.07	0.35	0.01	
	D 1905	22.90 -	23.95	1.05	<0.1	<0.1	0.10	0.97	<0.01	
	D 1906	23.95 -	25.00	1.05	0.4	379.0	25.68	8.61	0.53	
	D 1907	25.00 -	25.60	0.60	<0.1	<0.1	1.68	1.81	0.03	
	D 1908	25.60 -	26.20	0.60	<0.1	<0.1	0.24	2.84	<0.01	
	D 1909	26.20 -	26.70	0.50	<0.1	<0.1	<0.01	1.35	<0.01	
	D 1910	26.70 -	27.20	0.50	<0.1	<0.1	0.17	1.52	<0.01	
	D 1911	27.20 -	27.40	0.20	<0.1	<0.1	0.12	0.82	<0.01	
	D 1912	27.40 -	28.40	1.00	<0.1	<0.1	0.08	0.69	0.01	
	D 1913	28.40 -	30.15	1.75	<0.1	<0.1	0.05	0.14	<0.01	
	D 1914	30.15 -	30.80	0.65	<0.1	<0.1	<0.01	0.03	0.01	
MJMT-20	D 2001	27.65 -	27.75	0.10	<0.1	<0.1	0.88	4.72	0.04	
	D 2002	29.20 -	29.90	0.70	<0.1	<0.1	0.06	0.39	<0.01	
	D 2003	29.90 -	30.80	0.90	<0.1	<0.1	0.03	0.17	<0.01	
	D 2004	30.80 -	31.50	0.70	<0.1	<0.1	0.02	0.50	<0.01	
	D 2005	31.50 -	31.70	0.20	<0.1	<0.1	0.05	1.60	0.01	
	D 2006	31.70 -	32.00	0.30	<0.1	<0.1	0.66	1.19	0.02	
	D 2007	32.00 -	32.60	0.60	2.4	<0.1	0.25	22.71	0.86	
	D 2008	32.60 -	33.20	0.60	<0.1	<0.1	0.30	4.21	0.06	
	D 2009	33.20 -	33.50	0.30	<0.1	<0.1	0.03	1.11	<0.01	
MJMT-21	D 2101	24.50 -	26.00	1.50	<0.1	<0.1	<0.01	0.26	0.01	
	D 2102	26.00 -	26.30	0.30	<0.1	<0.1	0.02	0.52	<0.01	
	D 2103	26.30 -	27.20	0.90	1.5	13.1	2.30	1.25	0.19	
	D 2104	27.20 -	29.00	1.80	2.6	<0.1	2.44	1.26	0.20	
	D 2105	29.00 -	30.30	1.30	1.8	<0.1	0.60	1.51	0.14	
	D 2106	30.30 -	31.00	0.70	0.8	<0.1	0.28	1.16	0.12	
	D 2107	31.00 -	31.50	0.50	<0.1	<0.1	0.18	0.66	0.02	
	D 2108	31.50 -	33.00	1.50	<0.1	<0.1	0.10	2.31	<0.01	
	D 2109	33.00 -	34.30	1.30	<0.1	<0.1	0.02	2.00	<0.01	
	D 2110	34.30 -	36.00	1.70	<0.1	<0.1	0.01	0.83	<0.01	
MJMT-22	D 2201	23.60 -	24.60	1.00	<0.1	<0.1	0.15	0.09	0.01	
	D 2202	32.00 -	32.20	0.20	<0.1	<0.1	0.19	1.22	0.02	
	D 2203	32.20 -	32.90	0.70	0.2	<0.1	1.24	0.53	0.13	
	D 2204	32.90 -	33.95	1.05	2.7	319.0	23.10	2.67	0.33	
	D 2205	33.95 -	35.20	1.25	<0.1	<0.1	1.26	0.98	0.06	
	D 2206	35.20 -	36.75	1.55	<0.1	<0.1	0.07	0.84	<0.01	
	D 2207	36.75 -	39.00	2.25	<0.1	<0.1	0.41	0.51	<0.01	
	D 2208	39.00 -	39.20	0.20	<0.1	<0.1	0.27	0.75	0.01	
	D 2209	39.20 -	39.70	0.50	<0.1	<0.1	0.14	0.83	<0.01	
	D 2210	39.70 -	40.00	0.30	<0.1	<0.1	0.07	0.85	<0.01	
	D 2211	40.00 -	40.40	0.40	<0.1	<0.1	<0.01	0.76	0.01	
	D 2212	40.40 -	41.50	1.10	<0.1	<0.1	0.08	1.27	0.01	
	D 2213	41.50 -	42.25	0.75	<0.1	<0.1	0.04	0.66	<0.01	
	D 2214	42.25 -	43.60	1.35	<0.1	<0.1	0.02	0.43	<0.01	

Int. : Interval # : sample for ore reseve estimation

Assay Result of the Drilling Sample (3)

Hole No.	Sample No.	Locality from	Locality to	Int. (m)	Assay Au(g/t)	Assay Ag(g/t)	Assay Pb(%)	Assay Zn(%)	Assay Cu(%)	Remarks
MJMT-23	D 2301	6.70	7.30	0.60	0.2	<0.1	1.09	0.17	0.02	
	D 2302	22.70	23.00	0.30	0.2	<0.1	0.52	0.68	0.03	
	D 2303	33.40	33.90	0.50	<0.1	<0.1	0.02	1.56	<0.01	
	D 2304	33.90	34.30	0.40	<0.1	<0.1	0.03	2.27	<0.01	
	D 2305	34.30	35.20	0.90	<0.1	<0.1	0.03	1.36	<0.01	
	D 2306	35.20	35.90	0.70	<0.1	<0.1	0.07	0.36	<0.01	
	D 2307	35.90	36.60	0.70	<0.1	<0.1	0.07	0.88	0.01	
	D 2308	36.60	38.00	1.40	<0.1	7.2	0.11	1.52	0.03	
	D 2309	38.00	39.10	1.10	0.2	16.2	1.39	0.57	0.14	
	D 2310	39.10	39.70	0.60	<0.1	0.5	0.36	1.15	0.15	
	D 2311	39.70	40.70	1.00	<0.1	15.8	0.09	2.18	0.03	
MJMT-24	D 2401	3.60	3.75	0.15	<0.1	<0.1	0.40	0.24	0.01	
	D 2402	17.60	18.20	0.60	<0.1	<0.1	0.05	0.21	<0.01	
	D 2403	18.20	20.80	2.60	<0.1	<0.1	0.04	0.12	<0.01	
	D 2404	20.80	23.80	3.00	<0.1	<0.1	0.01	0.11	<0.01	
	D 2405	25.10	26.50	1.40	<0.1	<0.1	<0.01	0.04	<0.01	
	D 2406	27.20	30.30	3.10	<0.1	<0.1	0.01	0.03	<0.01	
	D 2407	31.80	33.60	1.80	<0.1	<0.1	<0.01	0.18	<0.01	
	D 2408	33.60	35.70	2.10	<0.1	<0.1	0.02	0.23	<0.01	
	D 2409	35.70	36.10	0.40	<0.1	0.1	0.12	0.45	0.01	
	D 2410	36.10	36.60	0.50	4.8	<0.1	0.27	0.21	0.09	
	D 2411	36.60	36.75	0.15	<0.1	<0.1	0.07	0.14	0.05	
	D 2412	36.75	37.20	0.45	<0.1	<0.1	0.05	0.11	0.01	
	D 2413	37.20	37.60	0.40	<0.1	<0.1	0.02	0.08	<0.01	
MJMT-25	D 2501	8.70	10.25	1.55	<0.1	<0.1	0.03	0.17	<0.01	
	D 2502	13.70	14.40	0.70	0.1	<0.1	0.04	0.07	<0.01	
	D 2503	14.55	16.90	2.35	<0.1	<0.1	0.12	0.10	<0.01	
	D 2504	19.50	21.20	1.70	<0.1	<0.1	0.06	0.30	<0.01	
	D 2505	22.15	22.45	0.30	<0.1	12.7	0.04	0.41	<0.01	
	D 2506	25.20	26.10	0.90	<0.1	<0.1	0.10	0.23	<0.01	
	D 2507	26.10	28.80	2.70	<0.1	<0.1	0.01	0.19	<0.01	
	D 2508	29.75	30.20	0.45	<0.1	<0.1	0.01	0.21	0.01	
	D 2509	30.20	30.50	0.30	<0.1	<0.1	0.11	0.30	<0.01	
	D 2510	30.50	30.70	0.20	0.1	<0.1	1.04	0.32	<0.01	
	D 2511	30.70	31.20	0.50	<0.1	<0.1	0.09	0.23	<0.01	
	D 2512	31.20	33.50	2.30	<0.1	<0.1	0.16	0.32	0.02	
MJMT-26	D 2601	14.00	16.25	2.25	<0.1	<0.1	0.03	0.12	<0.01	
	D 2602	23.00	25.30	2.30	<0.1	<0.1	0.13	0.21	0.01	
	D 2603	25.30	25.50	0.20	1.0	<0.1	0.68	0.09	0.04	
	D 2604	25.50	26.10	0.60	0.4	<0.1	0.42	0.12	0.04	
	D 2605	26.10	27.85	1.75	<0.1	<0.1	0.07	0.37	<0.01	
	D 2606	27.85	28.10	0.25	<0.1	<0.1	0.07	0.89	0.06	
	D 2607	28.10	28.85	0.75	0.2	<0.1	0.12	0.23	0.05	
	D 2608	28.85	29.20	0.35	0.5	<0.1	0.28	0.16	0.04	
	D 2609	29.20	30.60	1.40	5.2	<0.1	0.66	0.28	0.05	
	D 2610	30.60	31.30	0.70	2.7	9.5	0.21	0.26	0.07	
	D 2611	31.30	31.50	0.20	4.2	<0.1	0.12	0.12	0.06	
	D 2612	31.50	31.70	0.20	5.0	0.1	0.10	0.24	0.07	
	D 2613	31.70	33.20	1.50	0.2	<0.1	0.09	0.35	0.03	

Int. : Interval

Assay Result of the Drilling Sample (4)

Hole No.	Sample No.	Locality from	Locality to	Int. (m)	Assay Au(g/t)	Assay Ag(g/t)	Assay Pb(%)	Assay Zn(%)	Assay Cu(%)	Remarks
MJMT-27	D 2701	18.10	19.30	1.20	<0.1	<0.1	0.01	0.16	<0.01	
	D 2702	19.30	20.50	1.20	<0.1	<0.1	<0.01	0.20	<0.01	
	D 2703	20.50	21.60	1.10	<0.1	5.2	0.03	0.10	<0.01	
	D 2704	21.60	24.10	2.50	<0.1	<0.1	<0.01	0.10	<0.01	
	D 2705	24.10	24.40	0.30	<0.1	<0.1	0.05	0.01	<0.01	
	D 2706	24.40	24.95	0.55	<0.1	<0.1	0.13	<0.01	<0.01	
	D 2707	24.95	25.30	0.35	<0.1	<0.1	1.64	0.03	0.06	
	D 2708	25.30	27.00	1.70	<0.1	<0.1	0.11	0.13	0.02	
	D 2709	27.00	28.50	1.50	<0.1	<0.1	0.03	0.20	0.01	
	D 2710	28.50	30.15	1.65	<0.1	<0.1	0.31	0.19	0.03	
	D 2711	30.15	31.65	1.50	<0.1	<0.1	0.01	0.22	0.01	
	D 2712	31.65	31.90	0.25	<0.1	<0.1	0.03	0.11	0.01	
	D 2713	31.90	32.75	0.85	6.7	<0.1	0.39	0.10	0.02	
	D 2714	32.75	33.25	0.50	<0.1	<0.1	0.05	0.19	<0.01	
	D 2715	33.25	34.45	1.20	<0.1	<0.1	0.03	0.18	<0.01	
MJMT-28	D 2801	19.50	21.40	1.90	<0.1	<0.1	0.04	0.26	<0.01	
	D 2802	24.50	25.30	0.80	<0.1	<0.1	0.04	0.27	<0.01	
	D 2803	25.30	25.60	0.30	<0.1	<0.1	0.04	0.26	<0.01	
	D 2804	25.60	26.10	0.50	0.2	<0.1	0.51	0.16	0.06	
	D 2805	26.10	26.50	0.40	3.4	26.0	3.84	0.22	0.17	
	D 2806	26.50	26.75	0.25	0.5	4.9	2.28	0.11	0.09	
	D 2807	26.75	26.90	0.15	<0.1	<0.1	0.92	0.12	0.05	
	D 2808	26.90	28.00	1.10	<0.1	<0.1	0.17	0.30	0.03	
	D 2809	28.00	29.15	1.15	<0.1	<0.1	0.11	0.39	0.03	
	D 2810	29.15	30.10	0.95	<0.1	<0.1	0.05	1.83	0.01	

Int. : Interval

Apx. 14 Observation Resuls of the Thin Section

Legend

◎ abundant

○ common

△ rare

· very rare

→ altered to
or altered from

Abbreviations

· aggre	:	aggregate	· p	:	partly
· anh	:	anhedral	· pheno	:	phenocryst
· brec	:	bracciated	· pleoch	:	pleochroism
· cal	:	calcite	· porp	:	porphyritic
· cord	:	coroded	· recryst	:	recrystallized
· equigra	:	equigranular	· rhc	:	rhodocrosite
· enh	:	enhedral	· subh	:	subhedral
· frag	:	fragment	· v	:	vein
· fng	:	fine grained	· vlet	:	veinlet
· holocryst	:	holocrystalline	· w/	:	with
· lptf	:	lapilli tuff	· w-ext	:	wavy extinction
· microcryst	:	microcrystalline	· wk	:	weak

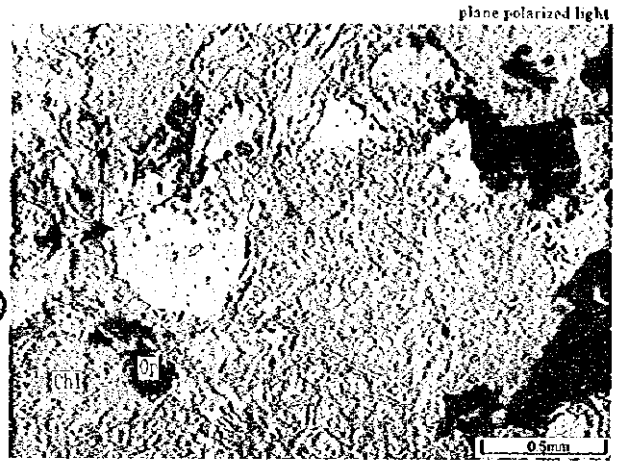
Sample No.	Rock Name	Texture	Primary minerals						Secondary minerals						Remarks
			Quartz Qz	Orthoclase Or	Plagioclase Pl	Mafic	Opaque op	others	Carbonate Carb	Sphalerite Sp	Sericite ser	Chlorite chl	Epidote ep	others	
60-1-229	Chloritized granodiorite	holocryst ~equigra	△0.52×0.72 subh~anh irregular p, v-ext.	△anh, Myrm ~ser	◎3.51×4.33 euh~subh ~ser, chl	○0.82×2.27 ~chl, ep, op	△0.62×1.24 euh~subh	・apatite 0.08×0.16 euh	○cal 0.07×0.09 ~Pl, mafic ・rhc 0.05×0.07 as vlet		△0.02×0.04 ~Pl, Or	◎0.82×2.27 as aggre ~mafic, Pl pleoch	・0.02×0.04 ~mafic		Clay mineral with ser veinlet bearing.
60-5-1	Altered rock w/Qz vein	holocryst ~equigra	◎0.52×0.72 anh, cord v-ext.	~ser	~ser	~ser(Mus)	・euh(Py) 0.52×0.52 ・anh(Go) 0.21×0.62 v/h. f. Carb, Sp	・apatite 0.04×0.21 euh	○rhc 0.31×0.41 anh~subh	△0.52×0.82 olive brown subh~euh v/Qz, rhc	◎0.27×0.56 ~Pl, mafic p. muscovite				Original texture is disturbed by alteration. Polished seccion
60-5-3	Altered brecciated rock	holocryst ~brec	◎0.82×1.44 anh~subh recryst in brec zone				・euh(Py) 0.41×0.41 ・anh irregular	・apatite 0.05×0.12	◎rhc 0.41×0.93 subh~anh aggre in brec zone	・0.52×0.62 olive yellow ~red brown subh v/rhc	△0.06×0.11 ~Pl				Two Sp mineralizations are recognized, within silicification and after brecciation. Polished seccion
60-5-7	Altered brecciated rock with Qz-Carb vein	holocryst ~brec	◎0.52×1.24 anh, angular wk. v-ext.				△0.52×1.03 euh~subh p. irregular	・apatite 0.07×0.19 euh~subh p. crushed	○rhc 0.42×0.72 in vlet	・0.62×0.82 olive brown ~red brown v/Qz, rhc vlet	◎ ~Pl, mafic p. muscovite				Qz V. w/Sp is cut by Carb V w/Sp. Qz and breccia shaw as like porphyritic texture. Polished seccion
60-5-10	Altered granodiorite	holocryst ~equigra	○0.52×0.82 anh v-ext.	△0.41×0.62 subh~anh micrographic ~ser	◎1.44×3.30 euh~Subh ~ser, Carb	△1.44×2.27 ~ser, chl, op	・0.62×1.03 euh(hm)	△apatite 0.21×0.82 euh	◎rhc 0.03×0.06 aggregate		◎0.03×0.04 ~Pl, mafic, Or	・ ~mafic v/op		・clay mineral ~mafic v/op	Qz-Carb veinlet bearing.
17-25.1	Altered brecciated rock w/ Qz-Carb vein	holocryst ~brec	◎0.52×1.03 subh~anh p. v-ext.				・0.52×0.35	△apatite 0.16×0.41	○cal 3.09×5.57 in matrix of breccia △rhc 0.39×0.58 aggre V w/Qz	△0.45×0.62 subh~anh red brown ~olive brown w/Qz, vlet	◎0.19×0.25 ~Pl, mafic p. muscovite			・fluorite 0.21×0.30 in vlet	Qz vlet is cut by Cal vlet, and these are cut by rhc vlet. Polished seccion
19-9.3	Altered tuff breccia	holocryst ~microcryst ~brec	・0.85×0.89 anh, cord v-ext.		○in matrix lath shape			○rock frag (lp tf) ~ser, chl	○cal in fragment △rhc in matrix		・0.12×0.25 ~Pl-pheno, frag	○0.62×0.68 aggre ~Pl, frag		○clay mineral in glass	Rock fragment is lapilli tuff. Matrix texture is microcrystalline. Calcite vein occurs final stage.
19-24.6	Altered rock w/Qz-Carb veinlet net	holocryst ~brec ~porp	◎0.62×1.01 in matrix as vlet				・0.31×1.01 subh~anh in V-let w/Sp	(・)apatite 0.04×0.08	○rhc 0.45×0.89 in vlet w/Qz ・cal 0.06×0.10 in matrix	△1.03×1.65 subh olive yellow ~red brown	◎0.02×0.06 ~Pl(?)				Chl-Carb veinlet and Carb-op veinlet are recognized. Polished seccion
20-9.0	Altered tuff breccia	holocryst ~microcryst ~porp ~brec	△0.14×0.21 anh, cord		○0.52×0.66 ~ser		・0.08×0.14	○rock frag ~ser, chl, ep △glass 0.10×0.21 ~chl	△rhc in matrix △cal as vlet w/chl, Op		○ ~frag. matrix	△0.33×0.56 aggre ~glass, frag	△0.11×0.18 aggre ~frag. matrix		Qz-op veinlet and clay veinlet occur.
21-36.0	Altered tuff	holocryst ~microcryst ~brec	・0.58×0.66 cord		○0.39×0.76 ~ser, chl	△0.21×0.21 ~Muscovite chl+op		・apatite 0.06×0.31 △glass 0.45×0.89 ~chl, clay ep on limb			◎0.07×0.14 ~Pl	○0.52×1.98 aggre ~mafic, glass	△0.14×0.24 aggre ~glass on limb as vlet w/Qz	○clay mineral in grass as vlet	Qz-op veinlet and clay veinlet occur.
22-21.6	Altered tonalite	holocryst ~seriate	○0.29×0.72 anh, irregular wk. v-ext.		◎0.62×2.27 euh~subh ~p. ser	・0.41×0.52 ~chl+op chl+epi+op	・0.21×0.31 irregular ~mafic (opacite)	(・)gircon 0.02×0.03 ・apatite 0.09×0.23	△cal 0.20×0.23 in matrix		・0.03×0.05 ~Pl	・0.24×0.27 ~mafic	・0.08×0.10 ~mafic		Qz-chl veinlet and Qz-op veinlet bearing.
24-16.3	Altered granodiorite	holocryst ~porp ~seriate	◎0.31×0.71 anh, irregular	△micrographic anh, irregular ~ser	◎1.03×2.27 euh~subh ~ser	○1.44×1.65 ~chl+epi ser, op ep aggregate	・0.21×0.31 subh~anh	・apatite 0.03×0.21 (・)gircon 0.02×0.03			・0.01×0.02 ~Pl, Or, mafic	○0.51×1.13 aggre ~mafic	△0.14×0.25 aggre ~mafic as vlet		Ep veinlet occurs.
26-17.8	Altered tonalite	holocryst ~porp ~seriate	○0.45×0.52 anh, irregular v-ext.		◎2.05×3.40 euh~subh	△0.41×1.34 ~chl, ser, op	・0.31×0.41 subh~anh frg aggre in mafic	・apatite 0.04×0.16 (・)gircon 0.02×0.05			△0.03×0.06 ~Pl, mafic	△0.05×0.08 ~mafic w/limonite Pl			Clay-ser-op veinlet and Clay-Op veinlet occur. Included dacitic tuff xenolith with sericitigation and chloritizatin.
27-17.5	Diorite porphyry	holocryst ~porp	・0.58×0.78 anh, irregular v-ext.	・0.12×0.16 anh	◎1.44×1.86 twin zoning	○augite 0.45×0.64 ・0.08×0.14 ~chl+ser+ep epi+ser+op	△0.45×0.76 euh~anh frg aggre in mafic	・apatite 0.06×0.07	・cal 0.09×0.10 v/ser, op ~mafic		・0.19×0.27 ~Pl	△0.10×0.16 ~mafic	・0.04×0.14 pleoch		
27-25.3	Quartz-Carbonate vein	holocryst ~seriate	◎1.96×2.58 durty by inclusion				・limonite 0.31×0.47		◎rhc 0.23×0.43 p. colloform ・cerusite v/limonite		・ as matrix of Qz grain		・0.12×0.20 v/limonite pleoch	・fluorite 0.07×0.10 in vlet	

Apx. 15 Photomicrographs of the Thin Section

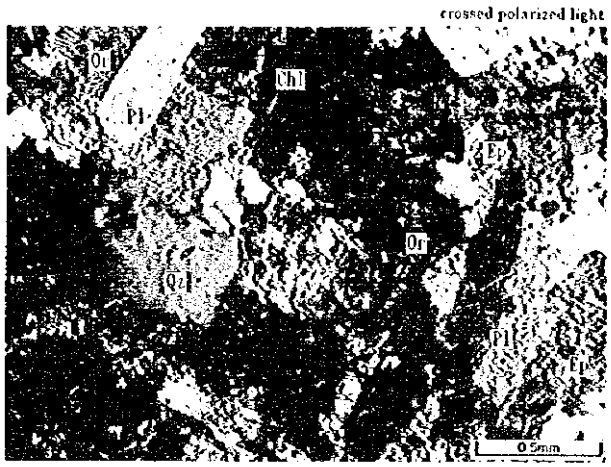
Abbreviations

- Ap : Apatite
- Cal : Calcite
- Chl : Chlorite
- CM : Clay minerals
- Cpx : Augite
- Cs : Cerussite
- Cv : Cavity
- Lm : Limonite
- Op : Opaque
- Or : Orthoclase
- Pl : Plagioclase
- Qz : Quartz
- Rf : Rock fragment
- Rhc : Rhodocrosite
- Ser : Sericite
- Sp : Sphalerite

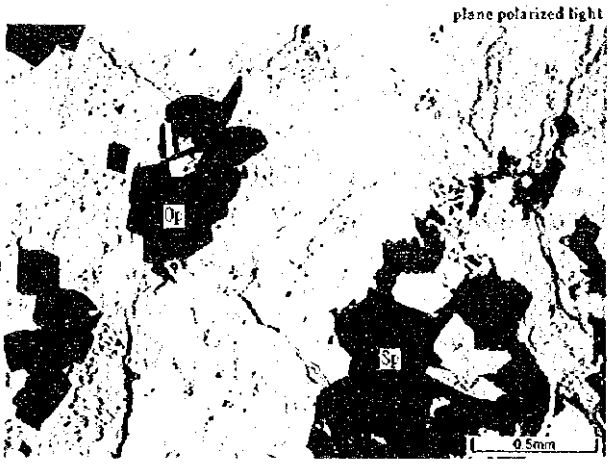
60 - 1 - 229



60 - 1 - 229

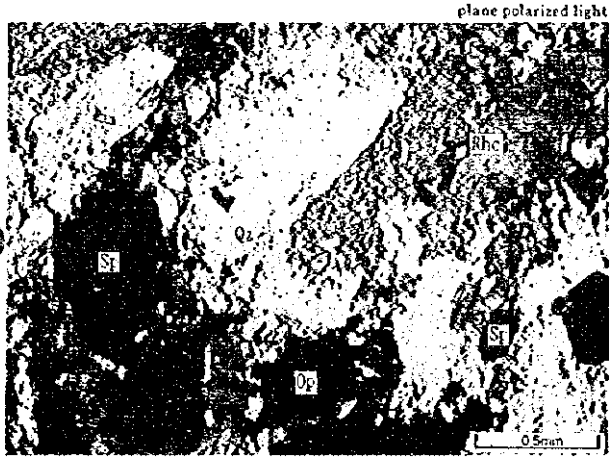


60 - 5 - 1

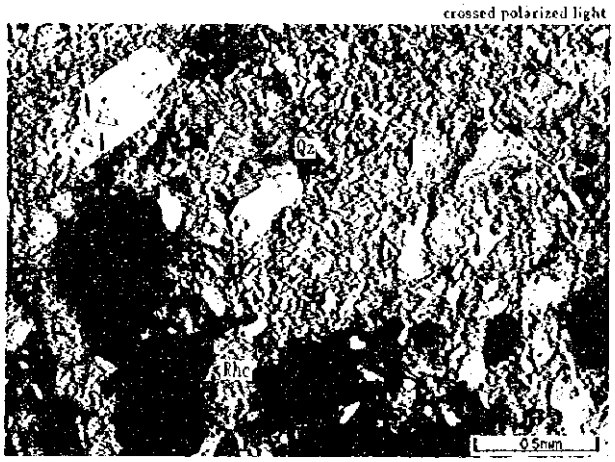


60 - 5 - 1

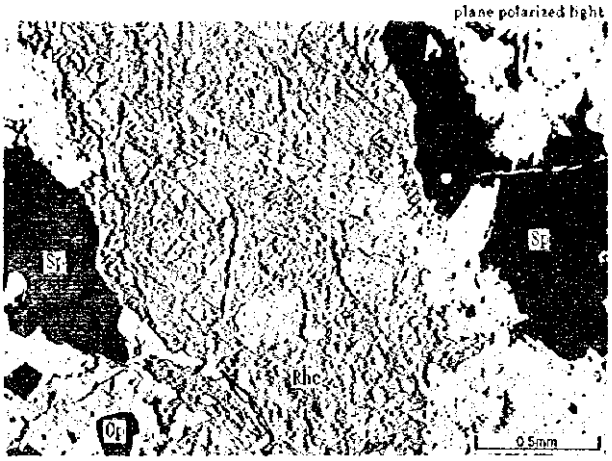
60 - 5 - 3



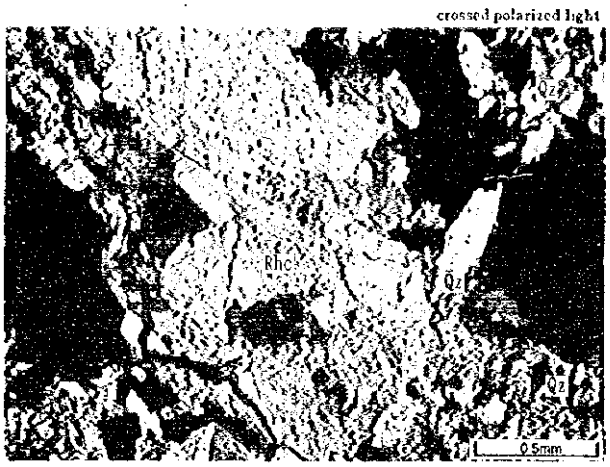
60 - 5 - 3



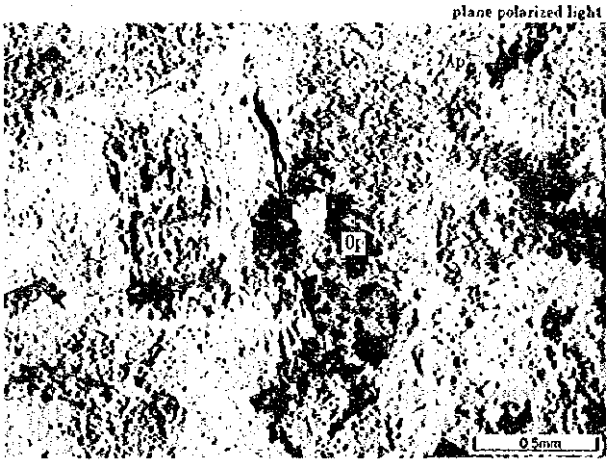
60 - 5 - 7



60 - 5 - 7



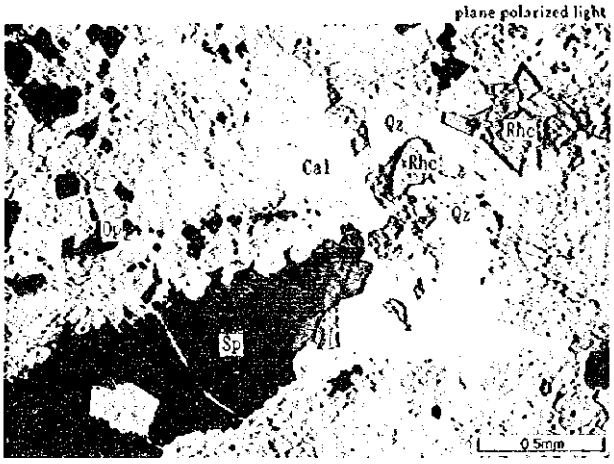
60 - 5 - 10



60 - 5 - 10

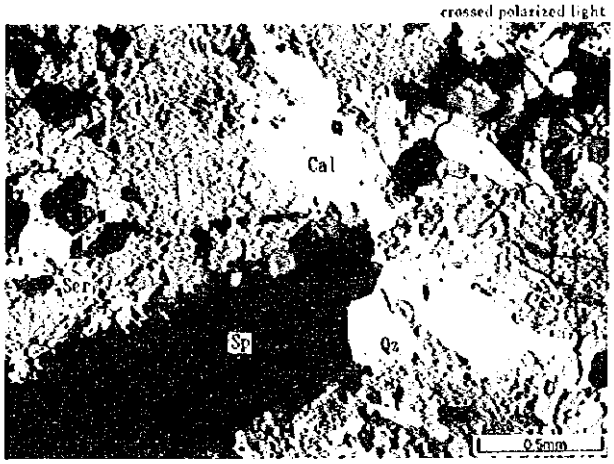
17 - 25.1

plane polarized light



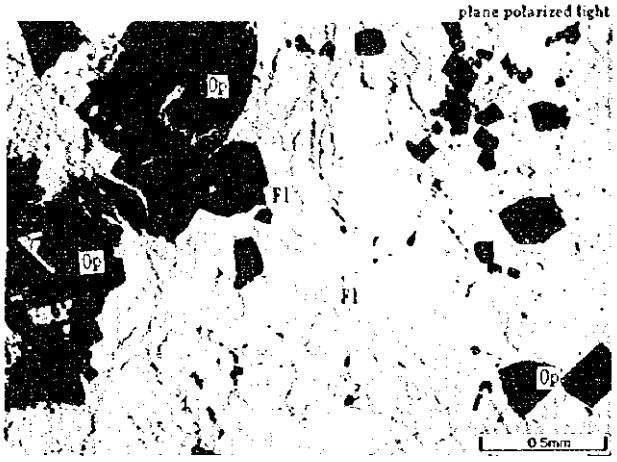
17 - 25.1

crossed polarized light



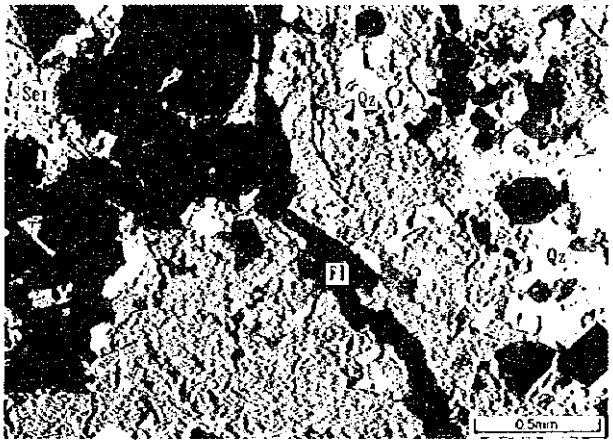
17 - 25.1

plane polarized light



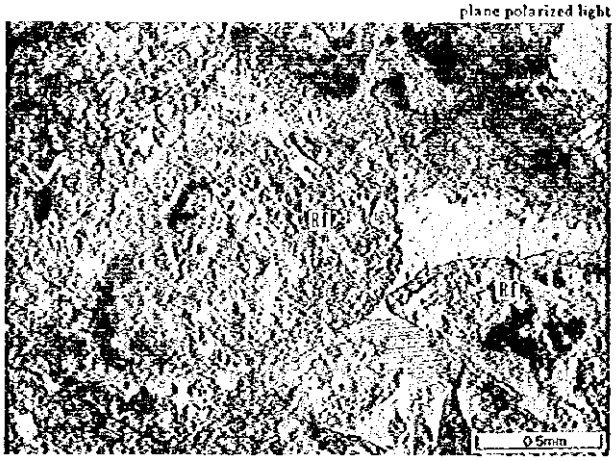
17 - 25.1

crossed polarized light



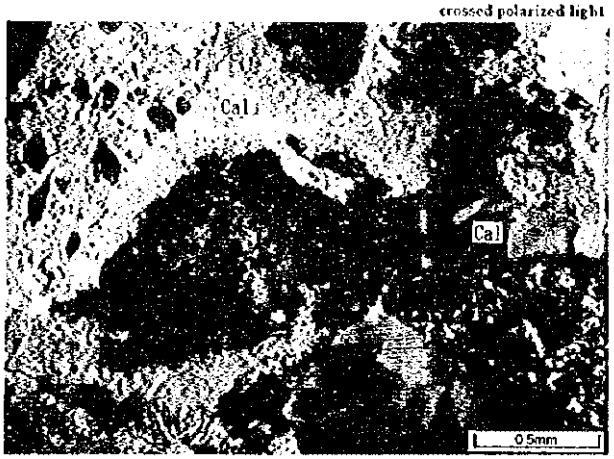
19 - 9.3

plane polarized light



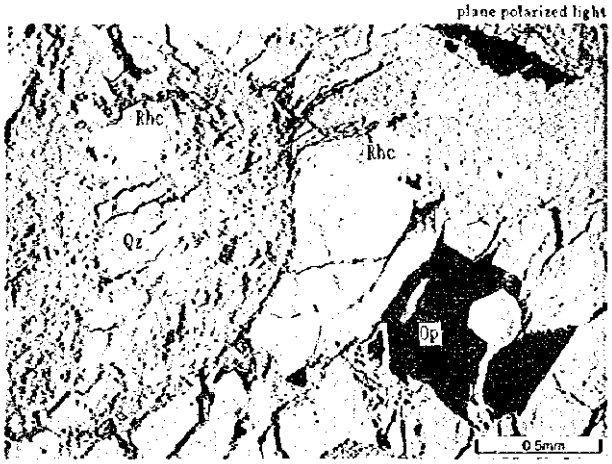
19 - 9.3

crossed polarized light



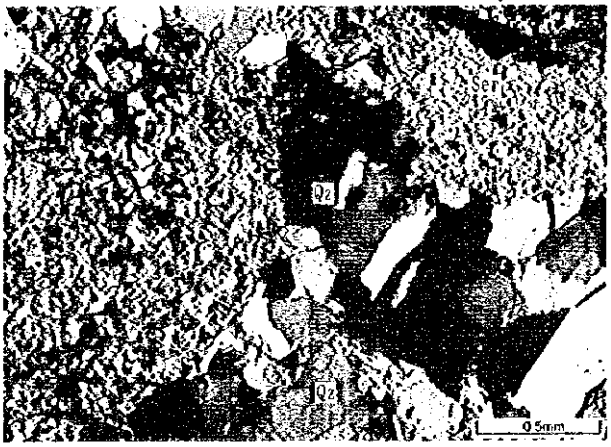
19 - 24.6

plane polarized light



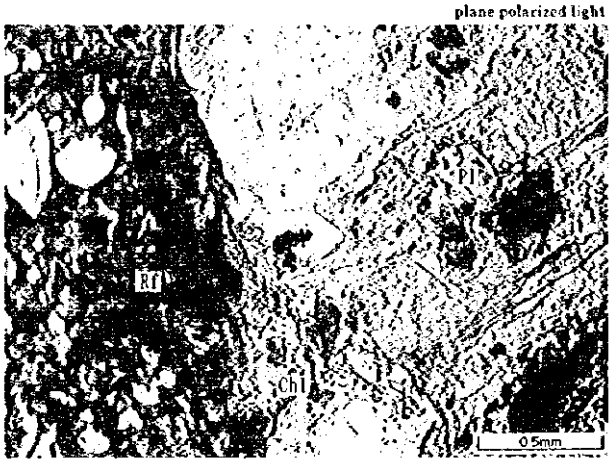
19 - 24.6

crossed polarized light



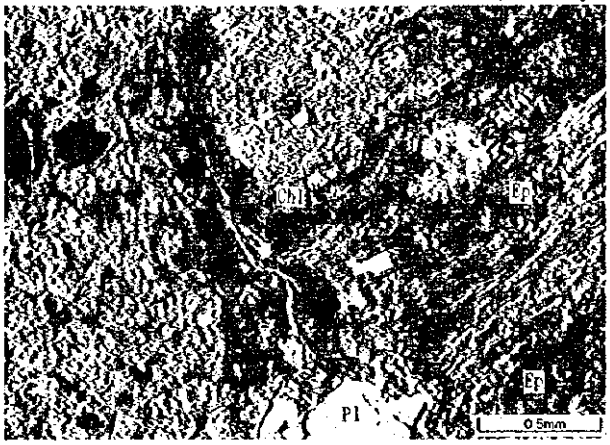
20 - 9.0

plane polarized light



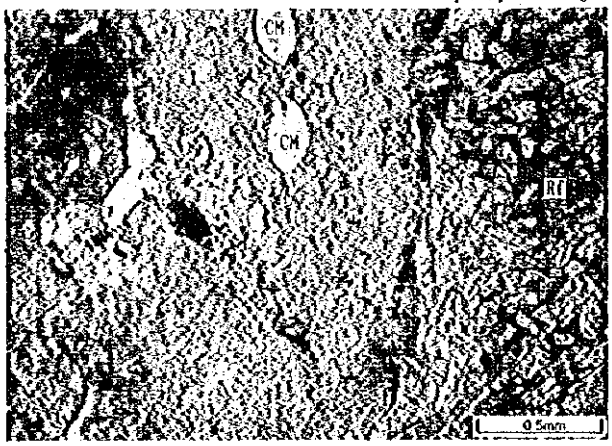
20 - 9.0

crossed polarized light



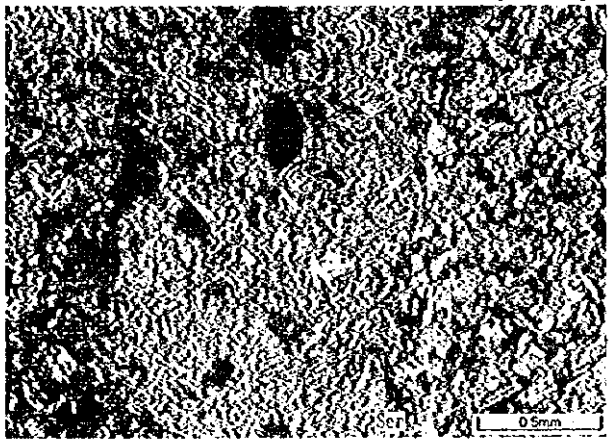
21 - 36.0

plane polarized light

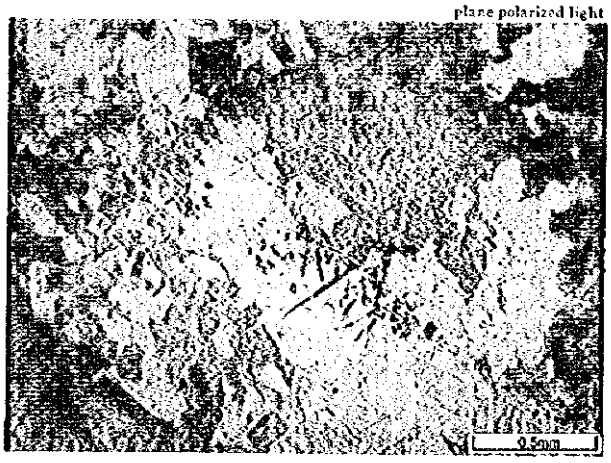


21 - 36.0

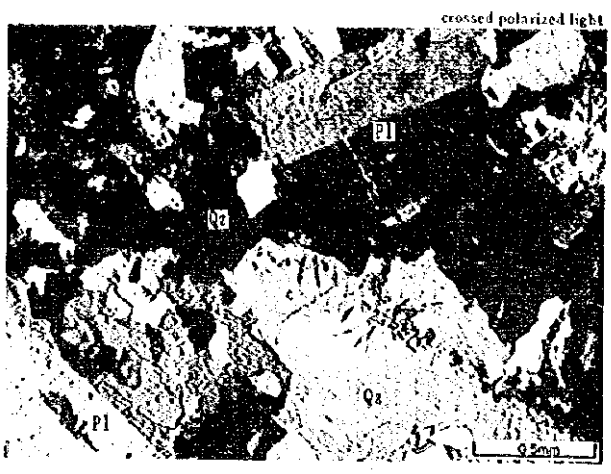
crossed polarized light



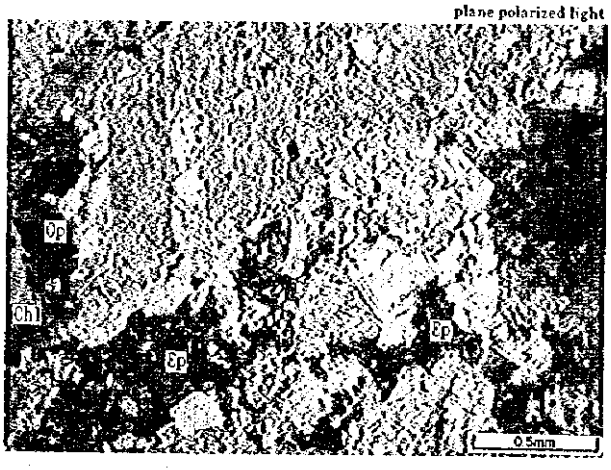
22 - 21.6



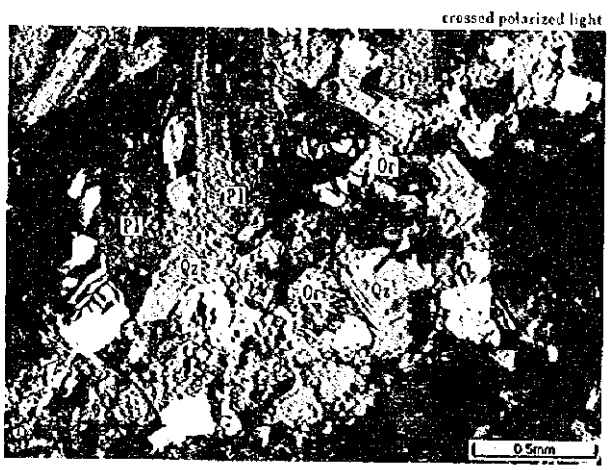
22 - 21.6



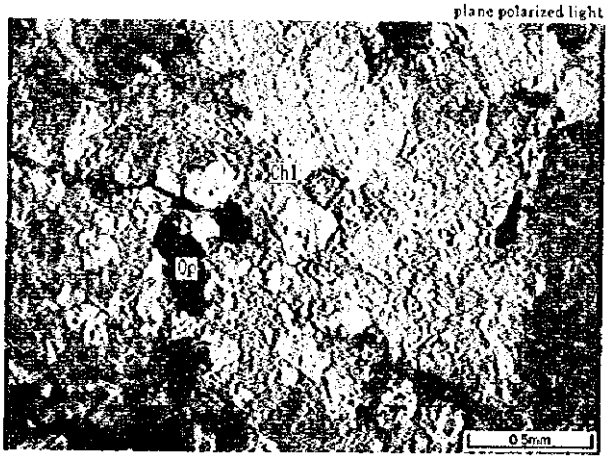
24 - 16.3



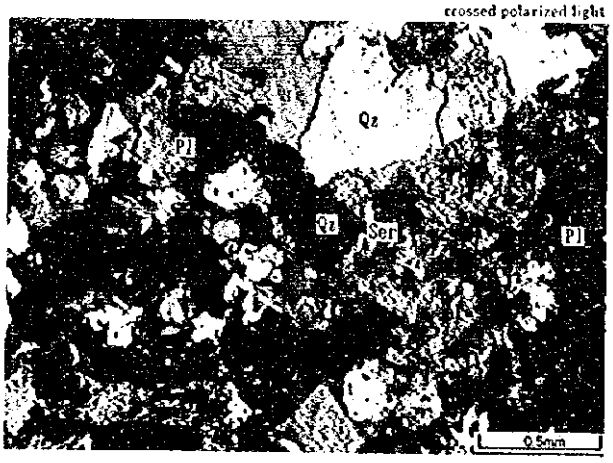
24 - 16.3



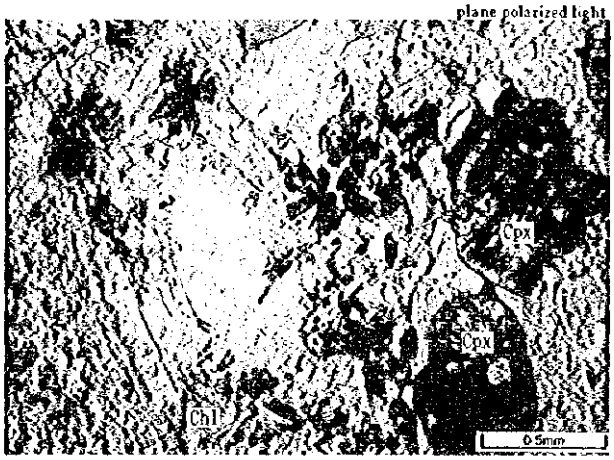
26 - 17.8



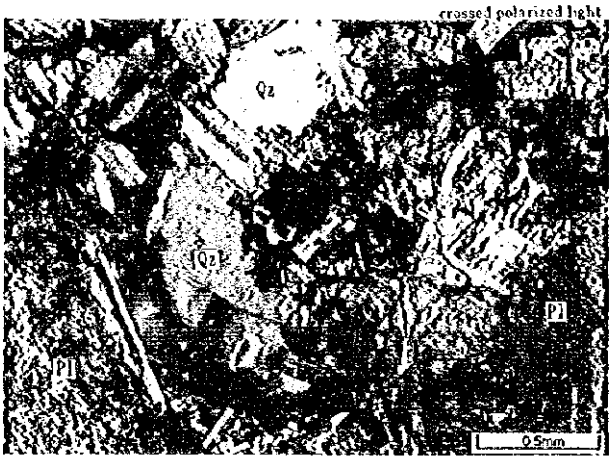
26 - 17.8



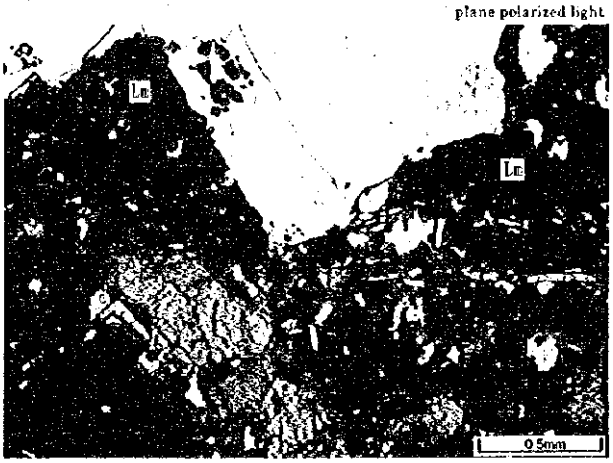
27 - 17.5



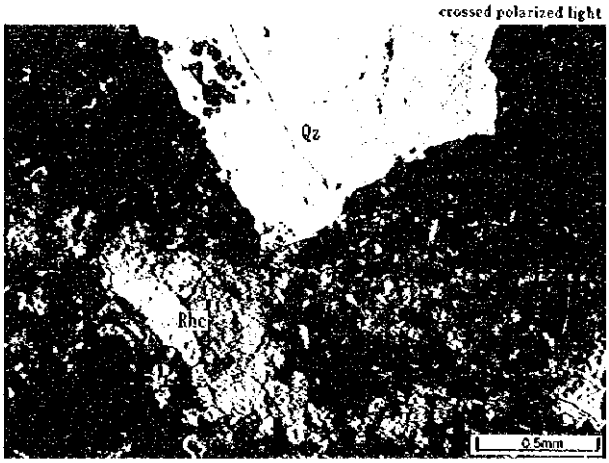
27 - 17.5



27 - 25.3



27 - 25.3



Apx. 16 Observation Results of the Polished Section

Legend

◎ abundant

○ common

△ rare

· very rare

→ altered to or altered from

Abbreviations

· aggr	: aggregate	· p	: partly
· anh	: anhedral	· porp	: porphyritic
· brec	: brecciated	· surr	: surrounding
· carb	: carbonate	· vlet	: veinlet
· diss	: disseminated	· w/	: with
· enh	: enhedral	· mas	: massive
· inclus	: inclusion		

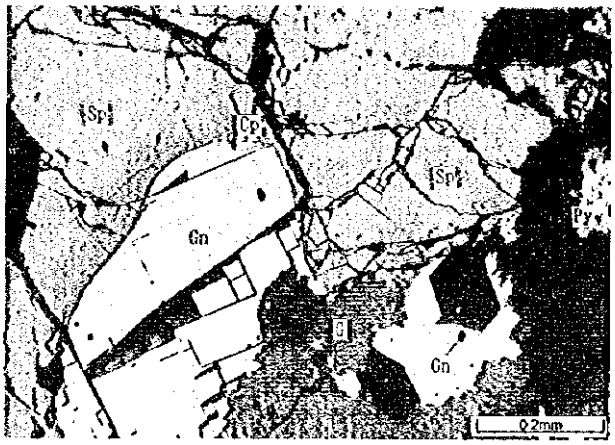
Sample No.	Rock Name	Pyrite Py	Sphalerite Sp	Galena Gn	Chalcopyrite Cp	Electrum El	Tetrahedrite Td	Polibasite Ps	Native Silver Ag	Chalcosite Cc	Covellite Cv	Cerusite Ce	Mn oxide Mn	Goethite Gt	Marcasite Ms	Remarks
60-5-1	Silicified granodiorite	○ 0.01~2 euh-anh diss	△ 0.001~1 in Qz Carb vlet w/Cp dot	△ 0.001~1 in Qz Carb vlet	• in Sp as inclus					• w/Cp						Thin section
60-5-3	Quartz-Carbonate vein w/Pb, Zn ore	○ euh-anh diss	◎	○	△ diss in crack of Sp		• 0.01~0.06 in Gn w/Cp	• 0.01~0.03 in Gn							△ →Py	Sp is megascopically brown to light brown. Thin section
60-5-5	Quartz-Carbonate vein w/Pb, Zn ore	○ euh-anh diss p. in Cp	◎	△ w/Cp	◎ in crack of Sp		• 0.02~0.03 w/Cp		• 0.003~0.015 in Py	• surr Cp in crack	• surr Cp in crack			△ →Py	△ →Py	Sp is megascopically brown to light brown.
60-5-6	Quartz-Carbonate vein w/Pb, Zn ore	○ 0.001~0.5 euh-anh aggr-diss	○ p. w/Cp dot porp-diss	○ porp-diss	△ diss surr Py in Sp as dot in crack of Sp		• w/Cp in Sp as vlet								△ →Py	
60-5-7	Silicified granodiorite	○ euh-anh diss-aggr	△ in Qz vlet w/Cp dot porp-diss	△ in Qz vlet porp-diss	• in Sp as inclus											Sp related with carbonitization has not Cp industion. Thin section
60-5-8	Quartz-Carbonate vein w/Zn, Cp ore	△ 0.001~0.5 euh-anh diss	◎ mas-diss	• w/Cp, Sp	○ porp-diss p. surr Sp in crack	• 0.015~0.033 w/Sp	• w/Cp			• surr Cp						Sp is megascopically brown to light yellowish brown.
60-5-9	Silicified granodiorite	○ 0.01~0.6 euh-anh diss-aggr	△ in Qz Carb vlet p. w/Cp dot porp-p. diss	△ in Qz Carb vlet porp-p. diss	• 0.01~0.05 in Sp, Gn as dot											Ti-oxide is observed.
15-15.0	Quartz-Carbonate vein w/Pb, Zn ore	△ 0.001~0.15 euh-anh aggr-diss	◎ mas-diss	◎ mas-diss →p. Ce	△ diss		• 0.02~0.05 in Gn	• 0.02~0.05 in Gn		• surr Cp, Sp in crack	• surr Cp, Sp in crack	△ surr Gn in crack				Sp is megascopically brown to olive brown.
15-15.2	Quartz-Carbonate vein w/Pb, Zn ore	△ euh-anh aggr-diss	○ mas-diss p. brec	◎ mas-diss →p. Ce p. brec	△ diss		• 0.02~0.05 in Gn	• 0.02~0.05 in Gn		• surr Cp, Sp in crack	• surr Cp, Sp in crack	△ surr Gn in crack				Sp is megascopically brown to olive brown.
17-19.85	Silicified rock with Qz network	◎ 0.01~0.5 euh-anh aggr-diss	△ in Qz Carb vlet w/Cp dot	○ in Qz Carb vlet	• in Sp as inclus		• 0.005~0.008 in Gn	• 0.005~0.008 in Gn								Ti-oxide is abundant.
17-25.1	Silicified rock with Qz network	○ 0.001~0.5 euh-anh aggr-diss	△ in Qz Carb vlet w/Cp dot diss	△ in Qz Carb vlet diss	• diss in Sp as inclus											Sp is megascopically dark brown to reddish brown. Thin section
19-24.6	Silicified rock with Qz network	○ 0.001~0.5 euh-anh aggr-diss	△ in Qz Carb vlet w/Cp dot porp-diss	△ in Qz Carb vlet porp-diss	△ in Qz Carb vlet porp-diss		• w/Cp, Cc			• surr Cp	• surr Cp					Thin section
20-32.3	Quartz-Carbonate vein w/Zn ore	△ euh-anh	◎ mas w/Cp dot p. brec	• diss	△ 0.001~0.3 diss in Sp as dot	• in crack of Sp				• surr Cp in crack of Sp	• surr Cp in crack of Sp					Sp is megascopically dark brown to reddish brown.
21-30.0	Quartz vein w/Gossan	• euh →Gt											◎ porp-fiberous laminated w/Gt	◎ →Py		
25-30.5	Quartz vein w/Gossan	△ euh diss →Gt											◎ porp-vlet fiberous	○ →Py		

Apx. 17 Photomicrographs of the Polished Section

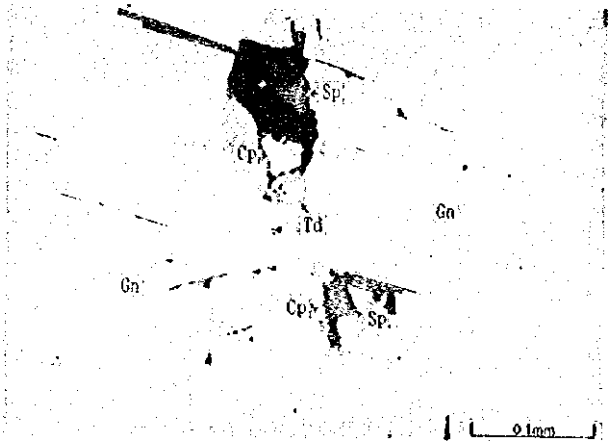
Abbreviations

- Ag : Native Silver
- Cc : Chalcocite
- Ce : Cerussite
- Cp : Chalcopyrite
- Cv : Covellite
- El : Electrum
- Fe : Fe-oxide
- G : Gangue
- Gn : Galena
- Mn : Mn-oxide
- Py : Pyrite
- Sp : Sphalerite
- Td : Tetrahedrite

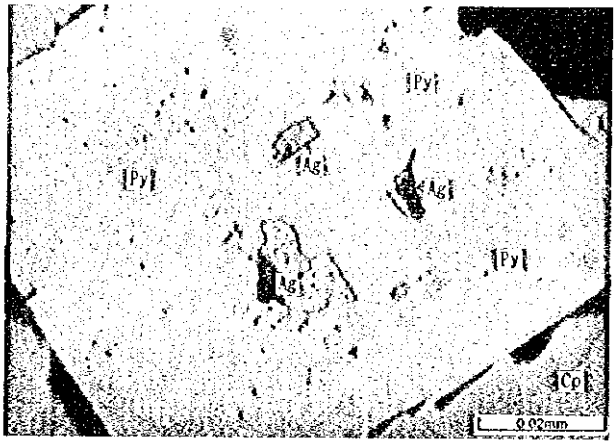
60 - 5 - 1



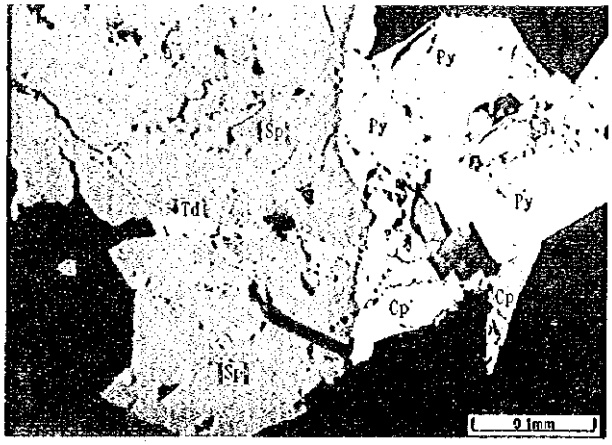
60 - 5 - 3



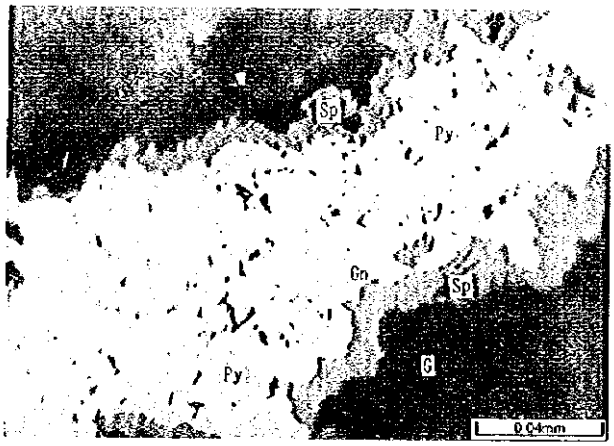
60 - 5 - 5



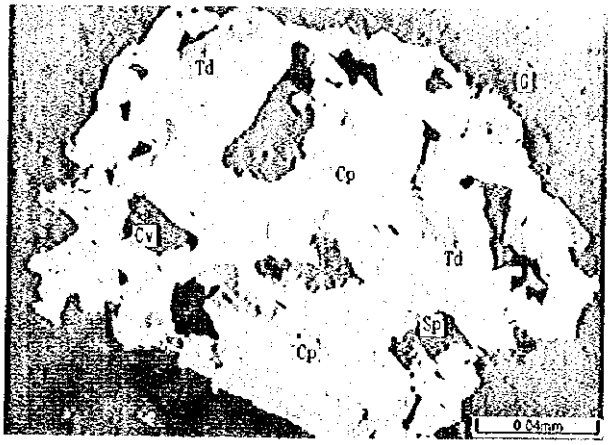
60 - 5 - 6



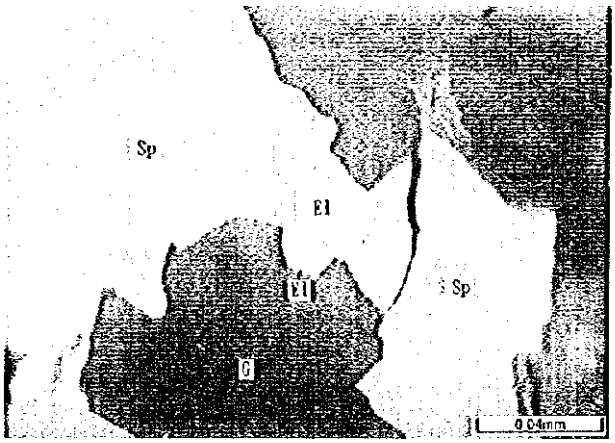
60 - 5 - 7



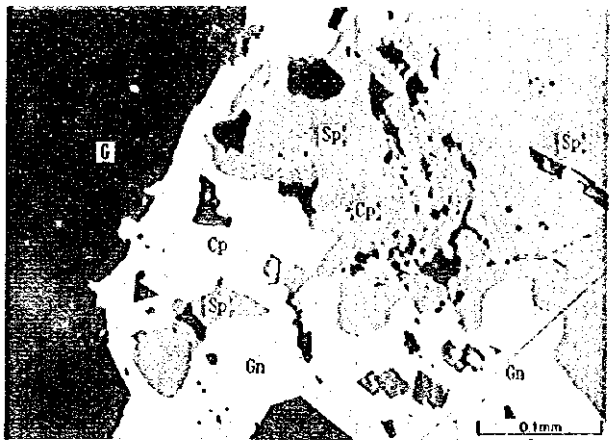
60 - 5 - 8



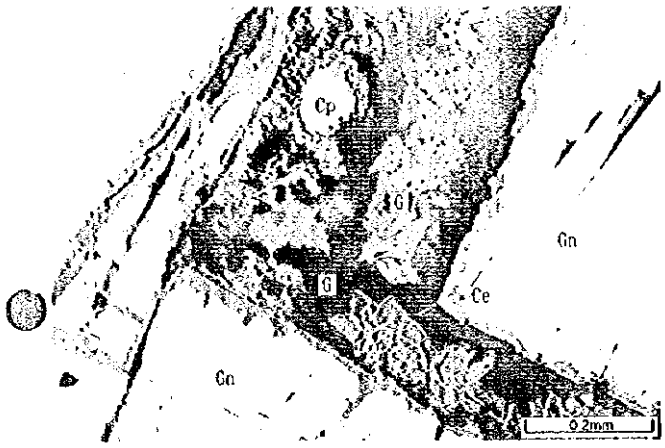
60 - 5 - 8



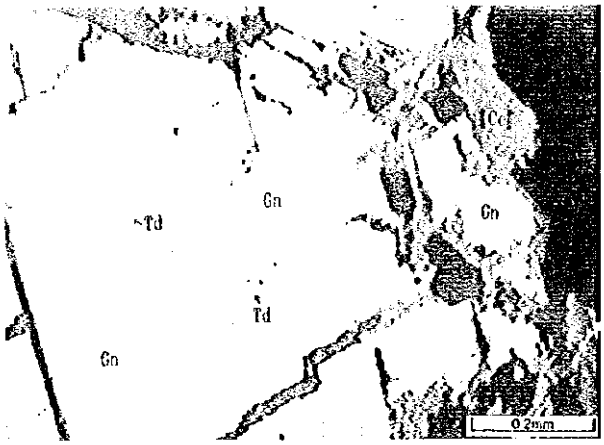
60 - 5 - 9



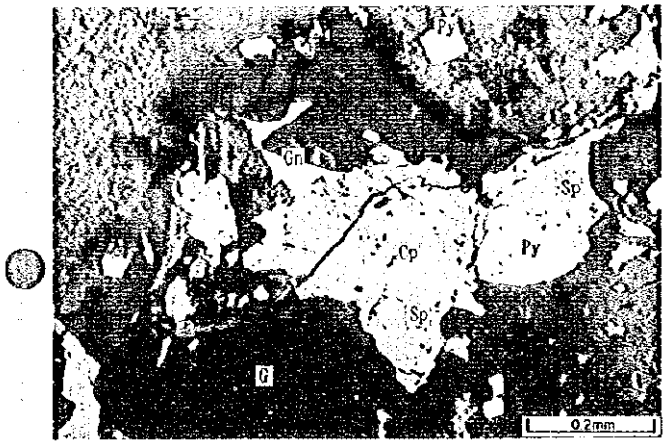
15 - 15.0



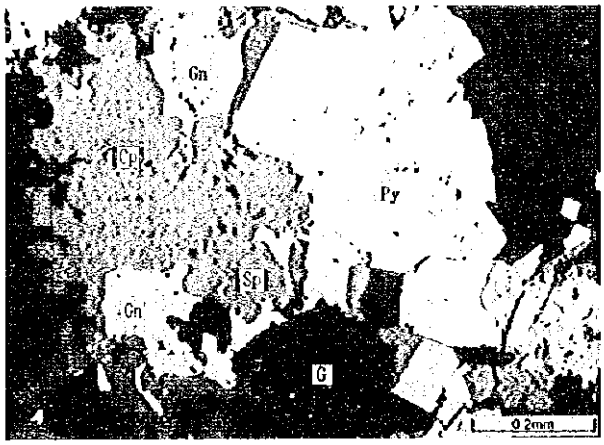
15 - 15.2



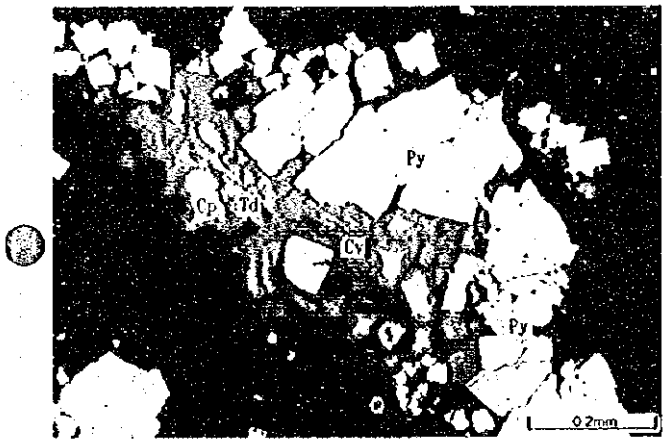
17 - 25.1



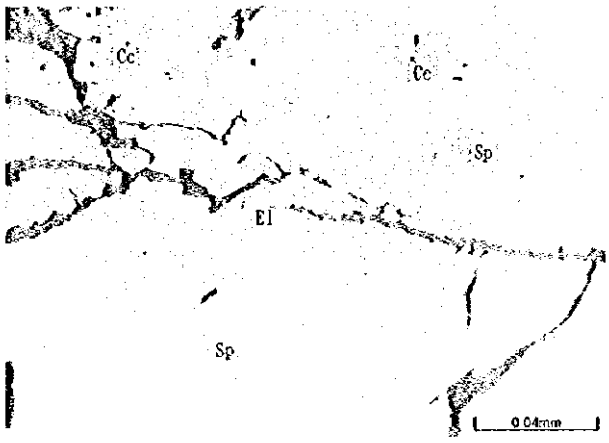
17 - 19.85



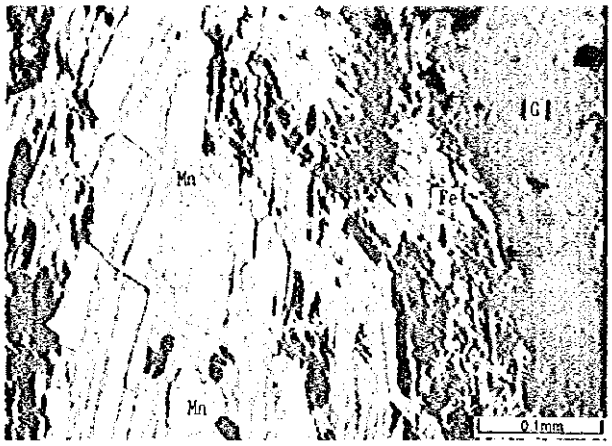
19 - 24.6



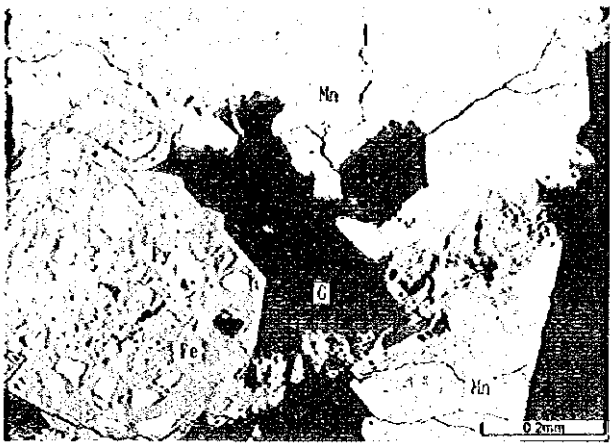
20 - 32.3



21 - 30.0



25 - 30.5



Apx. 18 Ore Reserve Estimation

	Vein	Block	Area (m²) upper	lower	Avg.	Length (m) upper	lower	Avg.	Width (m)	Hight (m)	Volume (m³)	S.G.	Reserve (t)	Grade Au (g/t)	Ag (g/t)	Pb (%)	Zn (%)	Cu (%)	Quantity of metal Au (g)	Ag (kg)	Pb (t)	Zn (t)	Cu (t)
Proved ore reserve	No.4	1	191	143	167.0	97.0	101.5	99.3	1.6	26.5	4,593.0	3.1	13,906	1.32	92.47	6.44	1.51	0.24	17,371.06	1,230.63	858.57	201.33	31.67
		2	143	125	134.0	101.5	71.0	86.3	1.6	28.5	3,819.0	3.1	11,539	0.63	70.53	5.88	4.24	0.13	7,268.99	835.02	590.11	501.91	14.91
		3	155	16	85.5	83.5	52.5	68.0	1.6	28.5	2,265.8	3.1	7,024	2.91	102.53	8.14	0.41	0.39	20,408.94	722.23	571.50	30.98	13.70
		4	16	8	12.0	52.5	20.5	36.7	0.3	26.0	312.0	3.1	967	3.21	7.67	1.17	1.72	0.06	3,107.94	7.42	11.32	16.67	0.58
		5	120	20	70.0	121.0	50.0	85.5	0.8	20.5	1,435.0	3.1	4,449	4.76	111.83	6.60	0.23	0.11	21,181.22	497.45	293.79	10.17	5.08
		6	19	126	72.5	20.0	105.0	62.5	1.7	27.0	1,957.5	3.1	6,068	2.66	64.36	3.45	0.34	0.19	13,709.47	390.61	209.23	20.71	11.53
		7	5	14	9.5	10.1	25.0	17.6	0.5	29.5	280.3	3.1	869	4.49	135.30	8.09	1.90	0.67	4,819.66	117.54	61.56	16.52	5.83
		total			545.2			555	1.2	181.5	14,562.3	3.1	44,821	1.96	85.31	6.06	1.93	0.19	87,362.26	3,901.05	2,700.06	850.50	83.27

	Vein	Level	Block	Area (m²)	Length (m)	Width (m)	Hight (m)	Volume (m³)	S.G.	Reserve (t)	Grade Au (g/t)	Ag (g/t)	Pb (%)	Zn (%)	Cu (%)	Quantity of metal Au (g)	Ag (kg)	Pb (t)	Zn (t)	Cu (t)
Probable ore reserve	No.4	trench	1	21	25.5	0.8	25.5	267.8	3.1	830	2.46	109.32	8.30	0.83	0.35	2,041.86	90.74	68.89	6.89	2.91
			2	83	54.5	1.5	28.5	1,182.8	3.1	3,667	2.30	231.40	13.29	2.90	0.55	8,433.01	848.43	487.28	106.33	20.17
			6	25	28.0	0.9	23.0	287.5	3.1	891	4.90	99.77	7.44	0.13	0.15	4,367.13	88.92	66.31	1.16	1.34
			7	11	17.0	0.6	17.0	93.5	3.1	290	3.73	261.86	10.77	0.10	0.24	1,081.14	75.90	31.22	0.29	0.70
			8	2	7.0	0.3	7.0	7.0	3.1	22	0.54	43.56	3.03	0.06	0.03	11.72	0.95	0.66	0.01	0.01
			9	7	10.0	0.7	10.0	35.0	3.1	109	1.34	37.41	1.97	0.13	0.24	145.39	4.06	2.14	0.14	0.26
			10	31	43.0	0.7	23.5	364.5	3.1	1,129	2.56	138.52	13.51	0.17	0.12	3,342.26	156.41	152.55	1.92	1.36
			11	16	23.0	0.7	23.0	184.0	3.1	570	2.02	134.86	11.87	0.23	0.14	1,152.21	76.84	67.71	1.31	0.80
			12	11	23.0	0.4	23.5	129.3	3.1	401	1.47	93.00	5.68	0.17	0.05	588.59	37.28	23.56	0.68	0.20
			13	3	8.5	0.4	8.5	12.8	3.1	40	2.75	147.86	6.08	0.14	0.10	108.69	5.84	2.40	0.06	0.04
			14	9	10.0	0.9	10.0	45.0	3.1	140	2.28	246.43	8.60	0.11	0.07	318.06	34.38	12.00	0.15	0.10
			15	4	8.0	0.5	8.0	16.0	3.1	50	1.02	56.53	2.97	0.12	0.09	50.59	2.80	1.47	0.06	0.04
			16	6	10.0	0.6	10.0	30.0	3.1	93	0.65	124.89	4.05	0.12	0.14	60.45	11.61	3.77	0.11	0.13
			17	5	12.0	0.4	12.0	30.0	3.1	93	4.21	128.44	7.65	0.11	0.11	391.53	11.94	7.14	0.10	0.10
			18	3	8.0	0.4	8.0	12.0	3.1	37	1.04	302.62	29.76	0.03	0.05	38.69	11.26	11.07	0.01	0.02
			total	237	283.5	0.8	22.5	2,696.3	3.1	8,360	2.65	174.34	11.22	1.43	0.34	22,131.51	1,457.45	938.16	119.23	28.16
		upper	3	100	90.0	1.1	23.5	1,175.0	3.1	3,643	1.12	175.06	8.20	5.95	0.28	4,079.69	637.73	298.69	216.73	10.20
			4	26	33.0	0.8	23.5	305.5	3.1	947	1.03	85.15	1.49	1.21	0.14	975.46	80.64	14.11	11.46	1.33
			11	19	20.0	1.0	10.0	95.0	3.1	295	4.40	2.67	0.45	0.28	0.06	1,295.80	0.79	1.33	0.77	0.18
			12	20	50.0	0.4	10.0	100.0	3.1	310	5.61	<0.1	0.45	0.10	0.02	1,739.10	0.00	1.40	0.31	0.06
		7	subtotal	165	193.0	0.9	20.3	1,675.5	3.1	5,194	1.56	138.46	6.07	4.41	0.23	8,089.96	719.16	315.52	229.26	11.76
		5	5	126	105.0	1.2	30.0	1,890.0	3.1	5,859	1.98	73.68	3.90	1.04	0.21	11,366.46	431.69	228.50	60.93	12.30
		0	7	100	90.0	1.1	30.0	1,500.0	3.1	4,650	1.12	175.06	8.20	5.95	0.28	5,208.00	814.12	381.30	276.65	13.02
			8	26	33.0	0.8	30.0	390.0	3.1	1,209	1.03	85.15	1.49	1.21	0.14	1,245.27	102.95	18.01	14.63	1.69
			9	125	71.0	1.8	20.0	1,250.0	3.1	3,875	0.83	85.44	7.71	6.79	0.19	3,216.25	331.08	298.76	263.11	7.36
		lower	10	8	21.0	0.4	10.0	40.0	3.1	124	4.30	23.00	3.19	2.91	0.69	533.20	2.85	3.96	3.61	0.10
			13	14	25.0	0.6	10.0	70.0	3.1	217	5.24	177.23	8.46	6.58	0.86	1,137.08	38.45	18.36	14.28	1.87
			subtotal	399	345.0	1.2	25.8	5,140.0	3.1	15,934	1.43	108.02	5.96	3.97	0.23	22,706.26	1,721.15	948.89	633.24	36.34
			total	564	538.0	1.0	24.2	6,815.5	3.1	21,128	1.46	115.50	5.98	4.08	0.23	30,796.22	2,440.31	1,264.41	862.50	48.11
		630m	1	7	15.5	0.5	31.0	108.5	3.1	336	0.84	34.31	3.88	8.23	0.07	283.80	11.54	13.03	27.69	0.23
			2	16	23.0	0.7	46.0	368.0	3.1	1,141	0.53	84.42	3.50	3.83	0.11	603.52	96.31	39.94	43.73	1.31
			3	41	35.5	1.2	60.0	1,230.0	3.1	3,813	1.43	319.16	9.10	4.35	0.43	5,460.53	1,216.95	347.05	165.73	16.35
			4	62	42.0	1.5	60.0	1,860.0	3.1	5,766	0.71	133.58	5.69	6.28	0.39	4,073.04	770.22	328.28	360.78	22.49
			5	11	18.0	0.6	35.0	198.0	3.1	614	0.84	194.59	6.35	6.08	0.69	514.17	119.40	38.98	37.30	4.22
			6	31	41.0	0.8	60.0	930.0	3.1	2,883	0.82	363.26	6.36	3.46	0.31	2,368.34	1,047.27	183.46	99.73	8.83
			7	63	68.0	0.9	60.0	1,890.0	3.1	5,859	3.15	171.52	3.05	3.13	0.14	18,473.69	1,004.96	178.90	183.42	8.20
			8	13	13.0	1.0	26.0	169.0	3.1	524	0.54	14.58	0.46	2.32	0.04	280.50	7.64	2.40	12.17	0.21
			9	67	69.0	1.0	60.0	2,010.0	3.1	6,231	1.95	294.79	6.87	4.57	0.23	12,131.61	1,836.85	428.14	284.80	14.11
			10	36	32.0	1.1	60.0	1,080.0	3.1	3,348	1.23	459.19	11.50	3.45	0.21	4,112.68	1,537.36	384.90	115.49	7.03
			11	39	18.0	2.2	35.0	702.0	3.1	2,176	2.02	118.06	6.83	3.82	0.16	4,386.51	256.96	148.60	83.13	3.46
			12	34	34.0	1.0	60.0	1,020.0	3.1	3,162	0.78	72.20	3.91	2.69	0.15	2,481.95	228.30	123.63	85.06	4.74
			13	16	22.5	0.7	45.0	360.0	3.1	1,116	0.38	27.49	2.87	1.48	0.08	420.80	30.68	32.05	16.58	0.93
			14	8	17.0	0.5	34.0	136.0	3.1	422	0.69	97.43	5.99	7.22	0.49	292.29	41.08	25.28	30.43	2.08
			15	115	93.5	1.2	60.0	3,450.0	3.1	10,695	1.32	211.32	7.58	7.29	0.52	14,139.53	2,260.03	810.93	779.73	55.37
			total	559	542.0	1.0	55.5	15,511.5	3.1	48,086	1.46	217.64	6.42	4.84	0.31	69,973.25	10,455.54	3,065.62	2,325.77	149.57
			total	1,360	1,373.5	1.0	36.8	25,023.8	3.1	77,574	1.58	185.16	6.82	4.26	0.25	122,901.29	14,363.29	5,288.19	3,307.50	225.84
			1	8	20.0	0.4	20.0	80.0	3.1	248	1.04	117.44	5.67	0.11	0.04	257.40	29.12	14.05	0.28	0.11
			2	113	105.5	1.1	30.0	1,695.0	3.1	5,255	0.70	177.94	11.44	0.51	0.15	3,678.27	934.99	601.15	26.81	9.97
			3	84	74.5	1.1	30.0	1,260.0	3.1	3,906	0.35	129.63	10.37	1.55	0.04	1,356.82	506.34	405.24	60.50	1.65
	No.6	trench	4	20	29.0	0.7	29.0	290.0	3.1	899	0.79	71.08	1.78	0.81	0.15	708.15	63.90	15.79	7.29	1.69
			5	8	14.0	0.6	14.0	56.0	3.1	174	0.12	70.86	4.12	0.50	0.15	20.73	12.30	7.16	0.87	0.26
			6	6	9.5	0.6	9.5	28.5	3.1	88	0.17	63.31	7.91	0.41	0.02	14.62	5.60	7.04	0.37	0.02
			7	13	30.0	0.4	30.0	195.0	3.1	605	0.12	191.24	14.31	0.21	0.07	73.91	117.42	86.49	1.27	0.41
			total	252	282.5	0.9	28.6	3,604.5	3.1	11,174	0.55	149.43	10.17	0.87	0.13	6,109.92	1,669.68	1,136.93	97.40	14.10
			1	9	13.0	0.7	26.0	117.0	3.1	363	0.07	313.07	1.03	1.38	0.02	26.25	113.55	3.75	5.01	0.06
			2	10	10.5	1.0	21.0	105.0	3.1	326	0.04	216.78	1.13	1.11	0.02	13.26	70.56	3.67	3.60	0.06
	No.8	630m	3	13	27.0	0.5	54.0	351.0	3.1	1,088	0.13	292.97	0.26	2.00	0.03	145.43	318.78	2.80	21.78	0.26
			4	103	65.0	1.6	60.0	3,090.0	3.1	9,579	0.01	703.55	1.65	4.41	0.03	654.32	6,739.68	158.83	422.65	2.44
		total		135	115.5	1.2	54.3	3,663.0	3.1	11,355	0.01	637.81	1.49	3.98	0.03	840.21	7,242.57	169.05	452.45	2.86
		Grand total		1,747	1,771.5	1.0	37.0	32,291.3	3.1	100,103	1.30	232.52	6.59	3.85	0.24	129,851.48	23,275.54	6,591.17	3,859.35	242.79

18- 1 Detail Of the Ore Reserve Estimation (Proved and Probable)