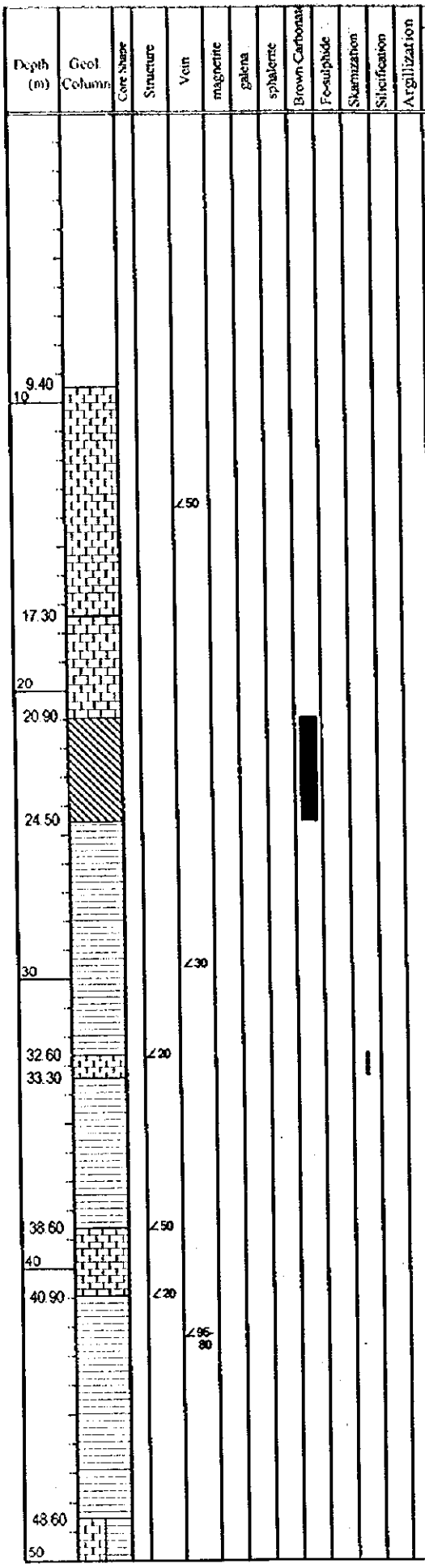
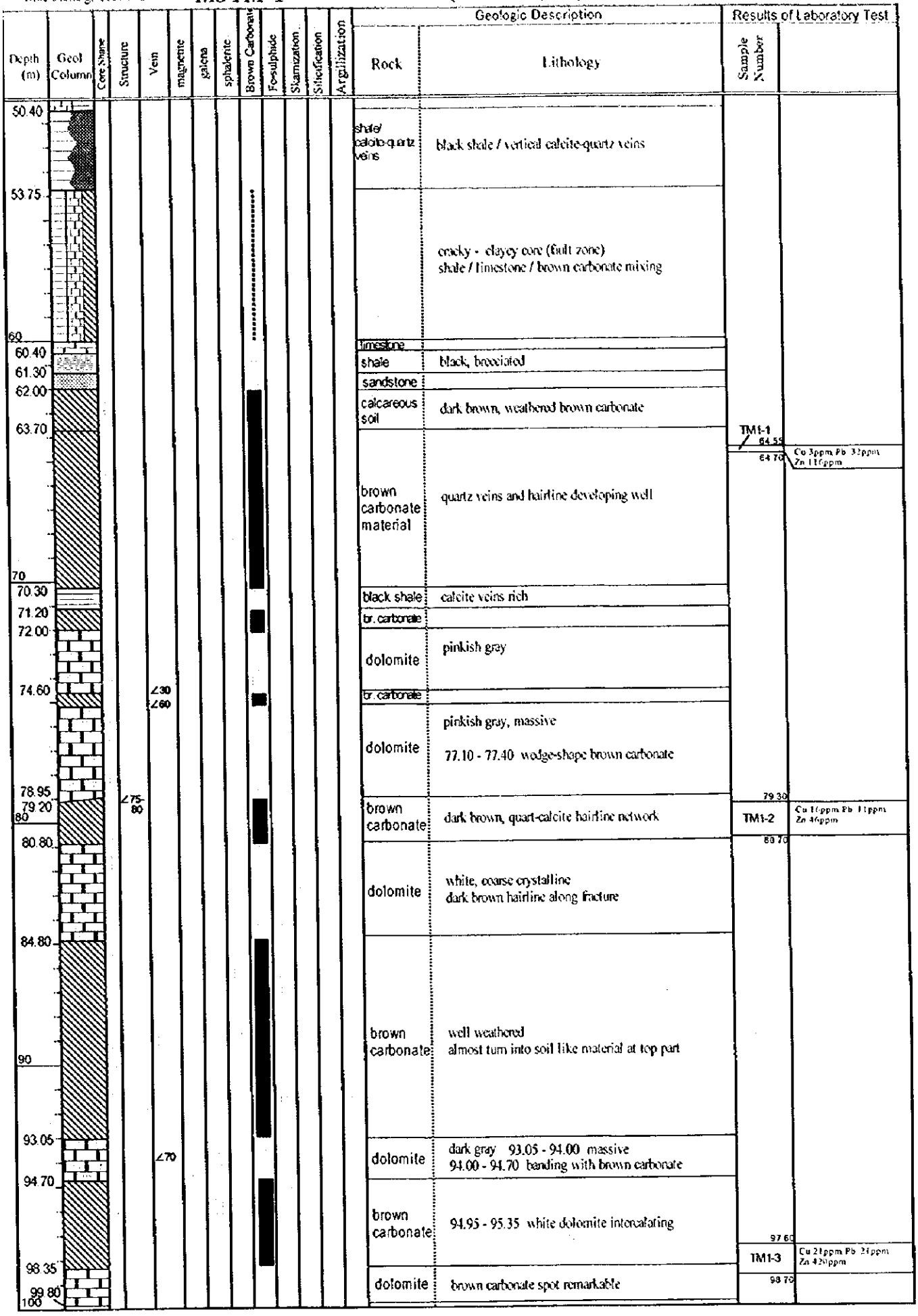
Appendix 12 Core logging sheet

Mae Sariang, Thailand **MJTM-1** (Scale 1/200) (1/5) (Depth: 0m - 50m)

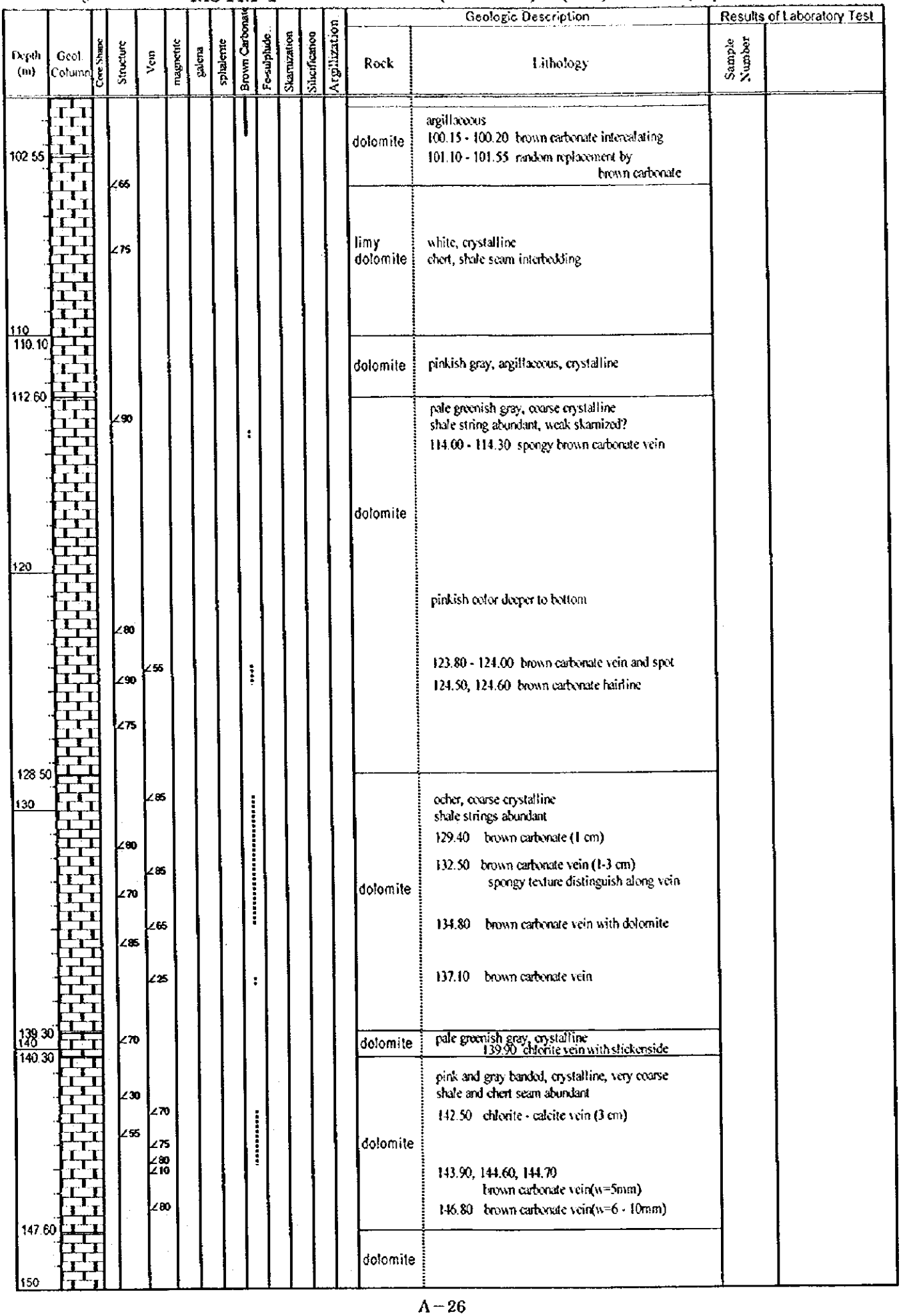


Geologic Description		Results of Laboratory Test	
Rock	Lithology	Sample Number	
Top soil	reddish brown pisolitic soil		
	yellowish brown soil		
	black shale fragment with limestone		
	brown soil with limestone fragments		
	limestone boulder and reddish brown cave soil		
limestone	light gray~ white argillic limestone argillic band showing pink to yellow		
limestone	light gray, massive, cave mud contained		
calcareous soil	weathered brown carbonate, clayey limestone fragments mixing		
black shale	24.50 - 27.50 strongly brecciated calcite network vein developing 27.50 - 32.60 oxidation remarkable 29.20 - 29.35 calcite - brown carbonate vein		
limestone	pale green, weak skarnized		
black shale	strongly sheared and oxidized calcite hairline and calcite-brown carbonate hairline abundant		
limestone	bluish gray, massive weak skarnized		
shale	light gray, cracky 41.80 - 44.00 quartz-calcite vein 45.60 - 46.00 quartz-calcite pool with brown carbonate 47.10 - 48.60 brecky, strong oxidization		
shale/ limestone	cracky, weathering along fracture		

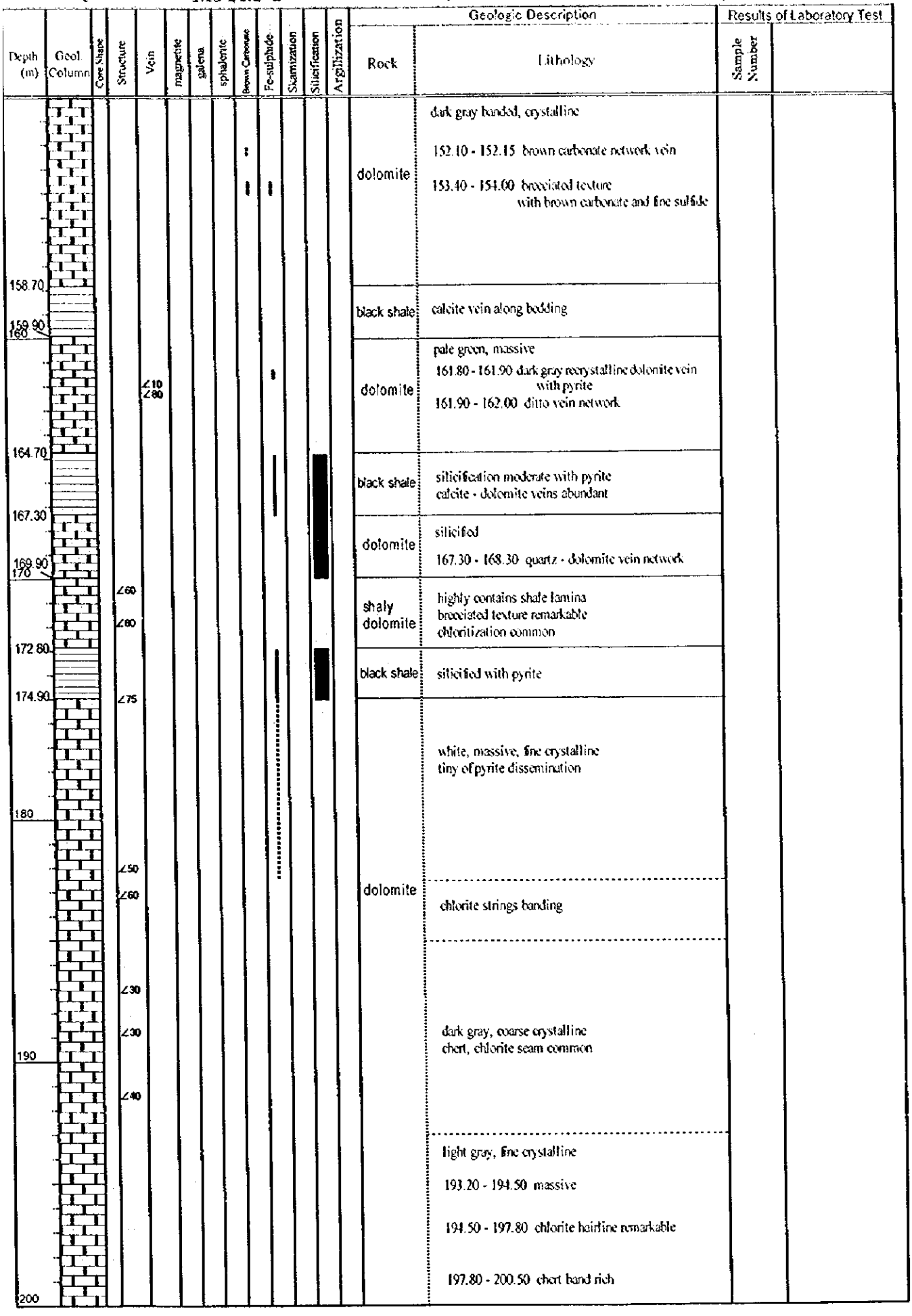
Mae Sariang, Thailand **MJTM-1** (Scale 1/200) (2/5) (Depth: 50m - 100m)



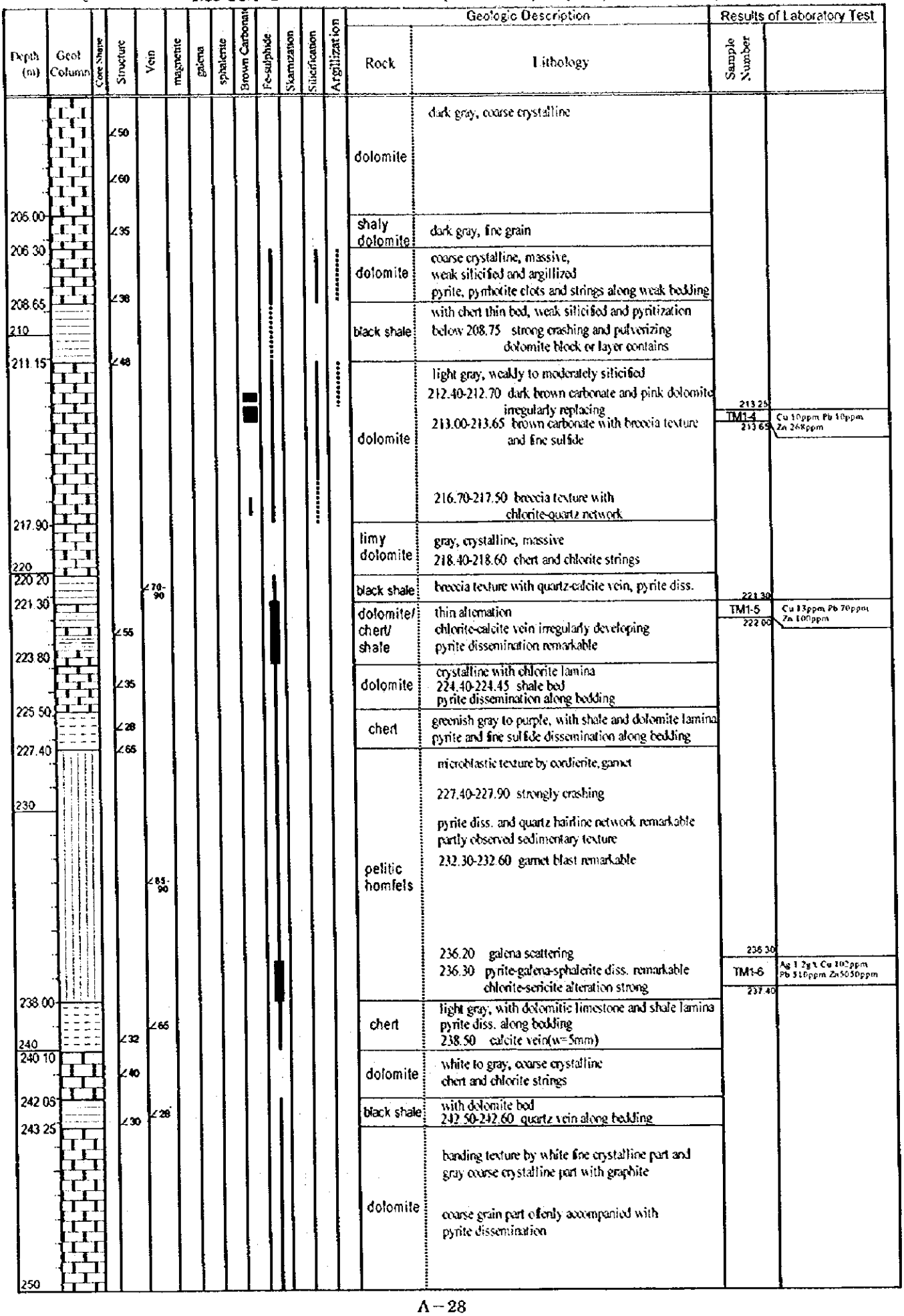
Mae Sariang, Thailand **MJTM-1** (Scale 1/200) (3/5) (Depth: 100m - 150m)



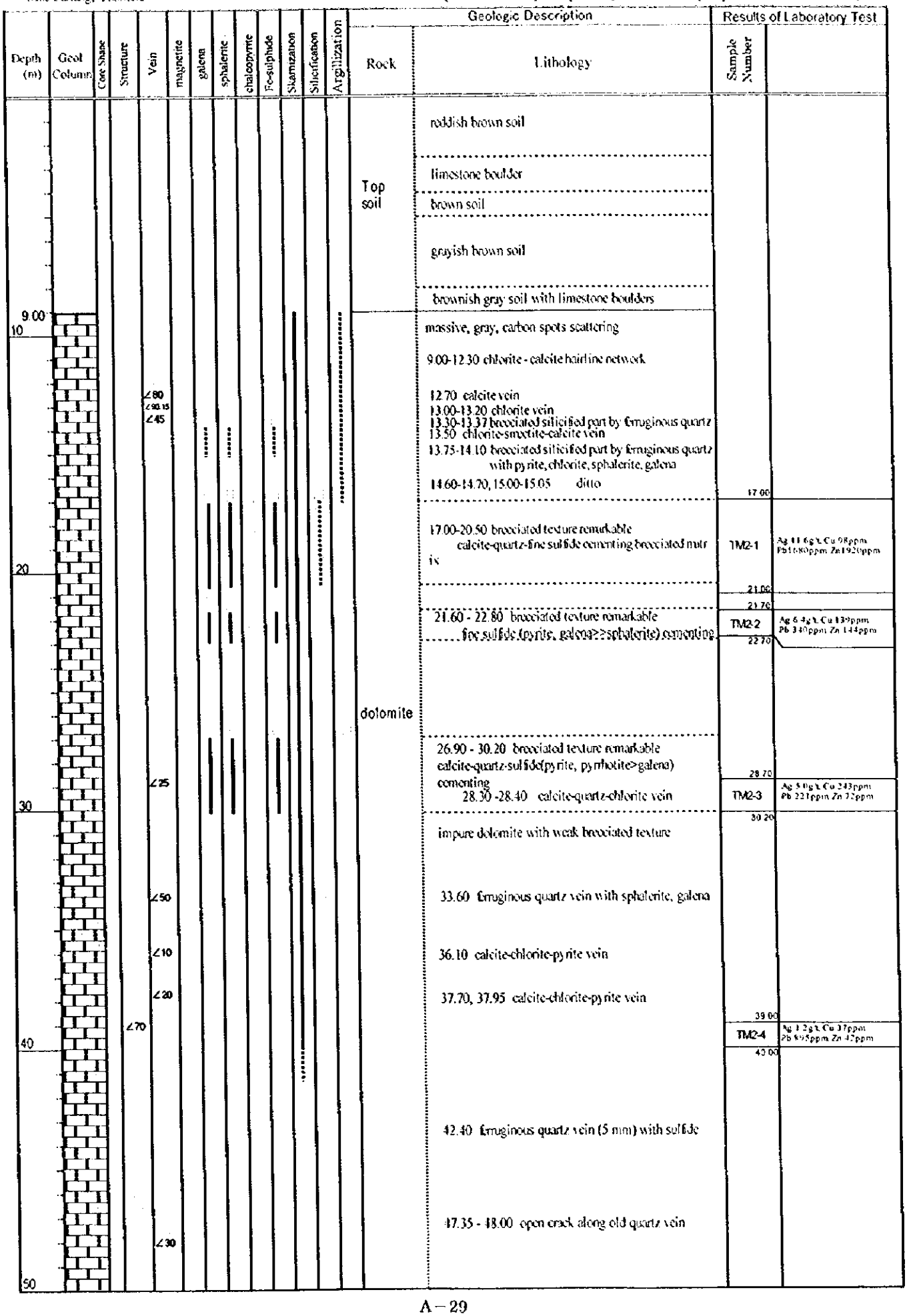
Mae Sariang, Thailand **MJTM-1** (Scale 1/200) (4/5) (Depth: 150m - 200m)



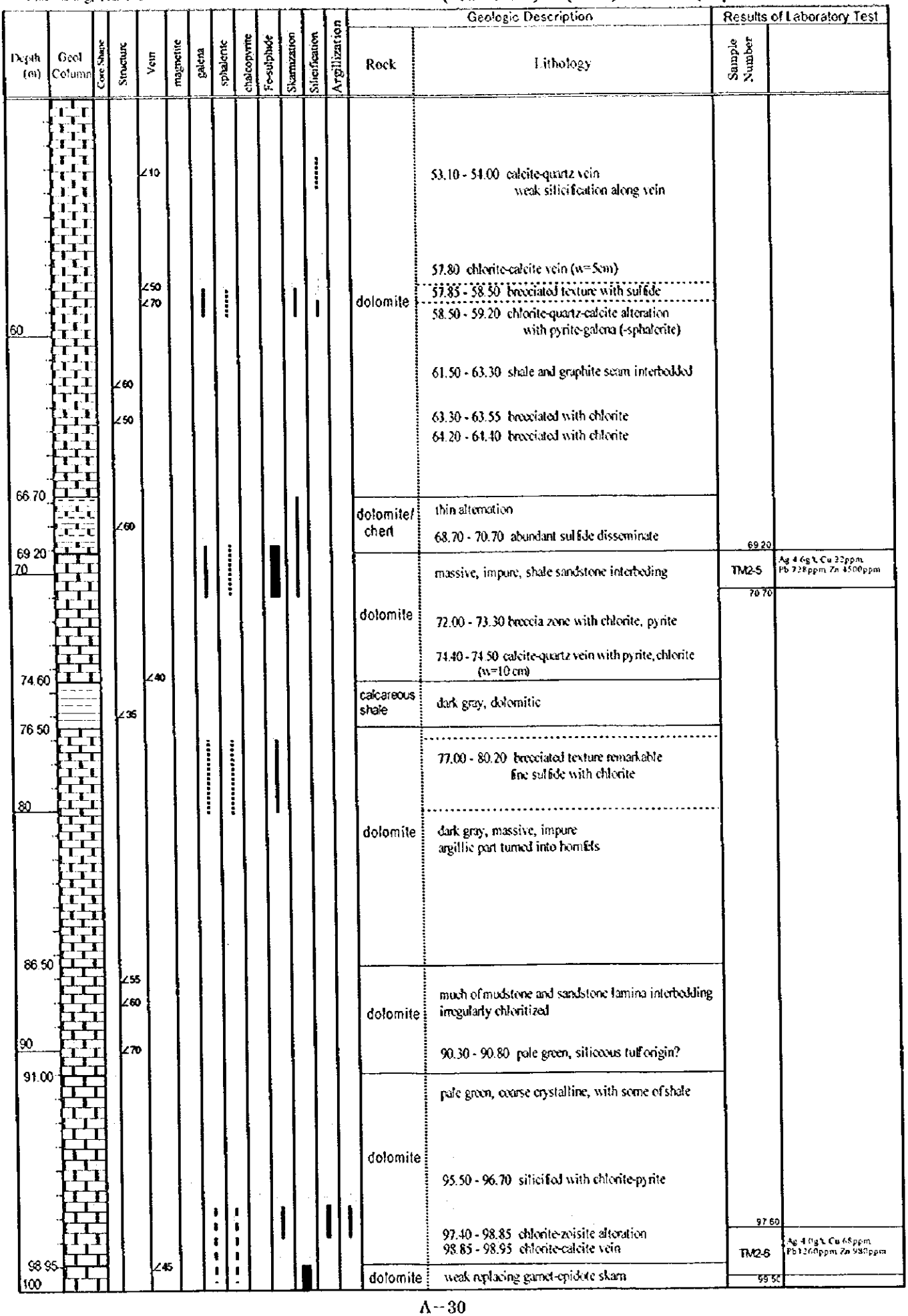
Mae Sariang, Thailand **MJTM-1** (Scale 1/200) (5/5) (Depth: 200m - 250m)



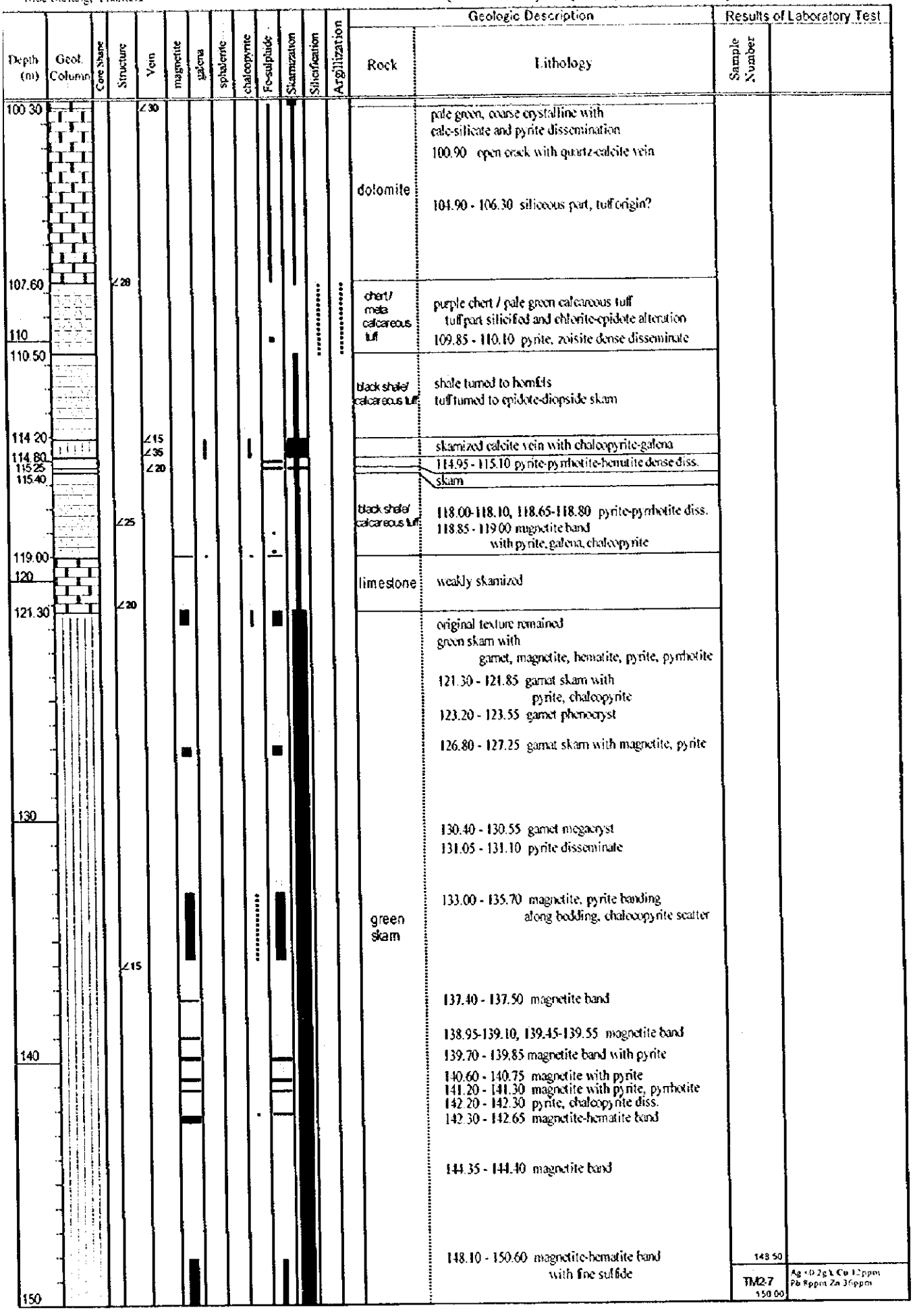
Mae Sariang, Thailand **MJTM-2** (Scale 1/200) (1/7) (Depth: 0m - 50m)



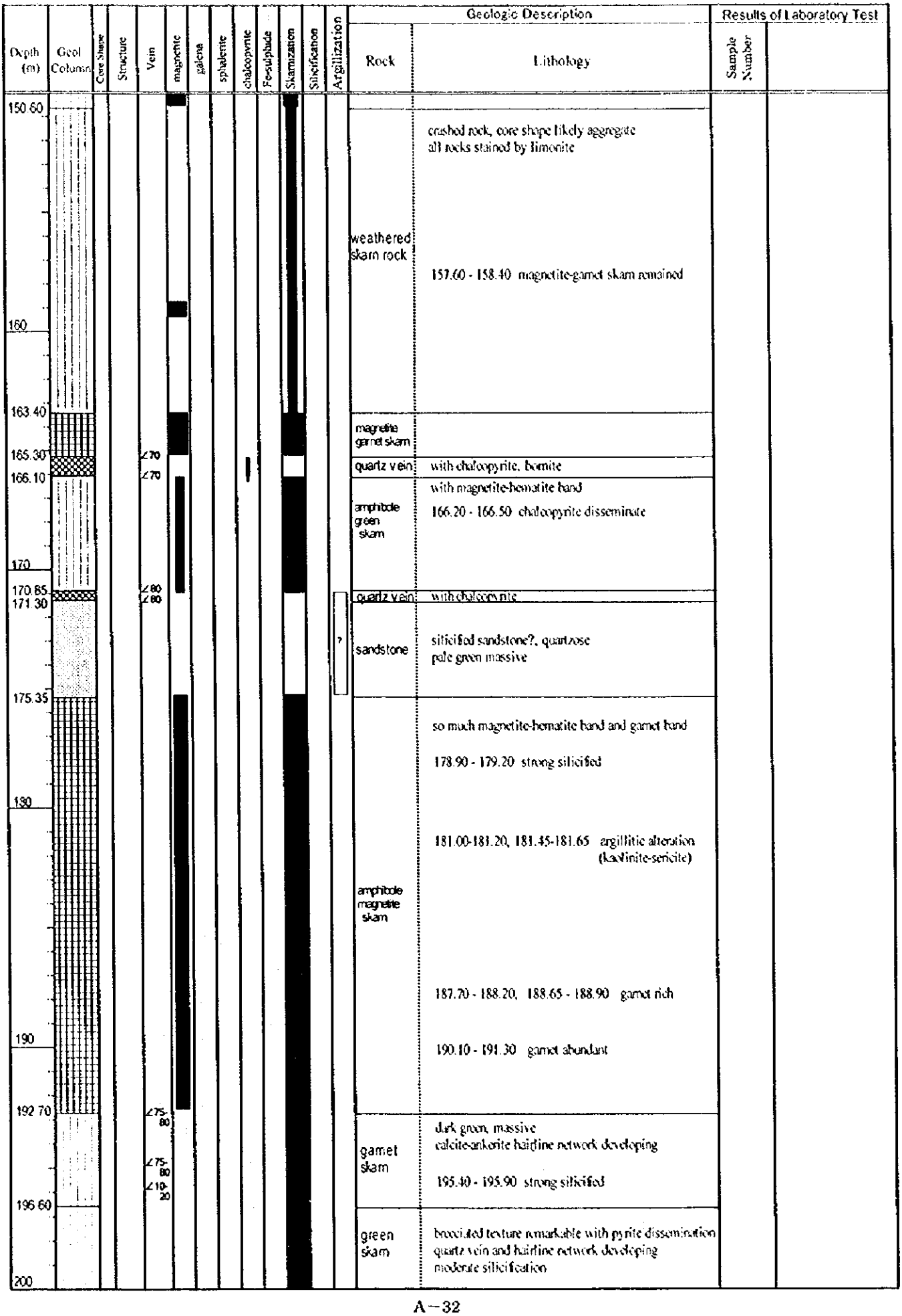
Mae Sariang, Thailand **MJTM-2** (Scale 1/200) (2/7) (Depth: 50m - 100m)



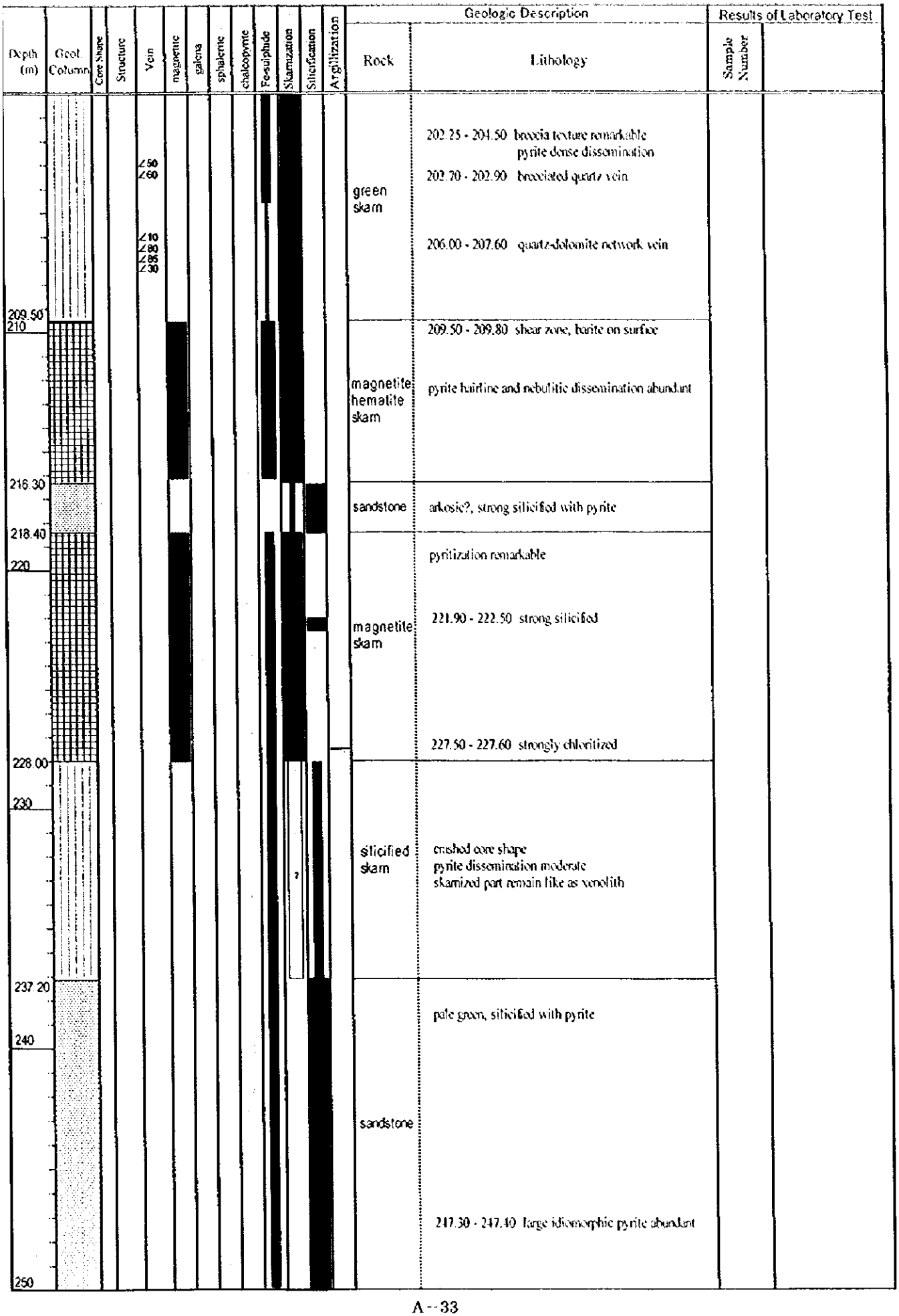
Mae Sariang, Thailand **MJTM-2** (Scale 1/200) (3/7) (Depth: 100m - 150m)



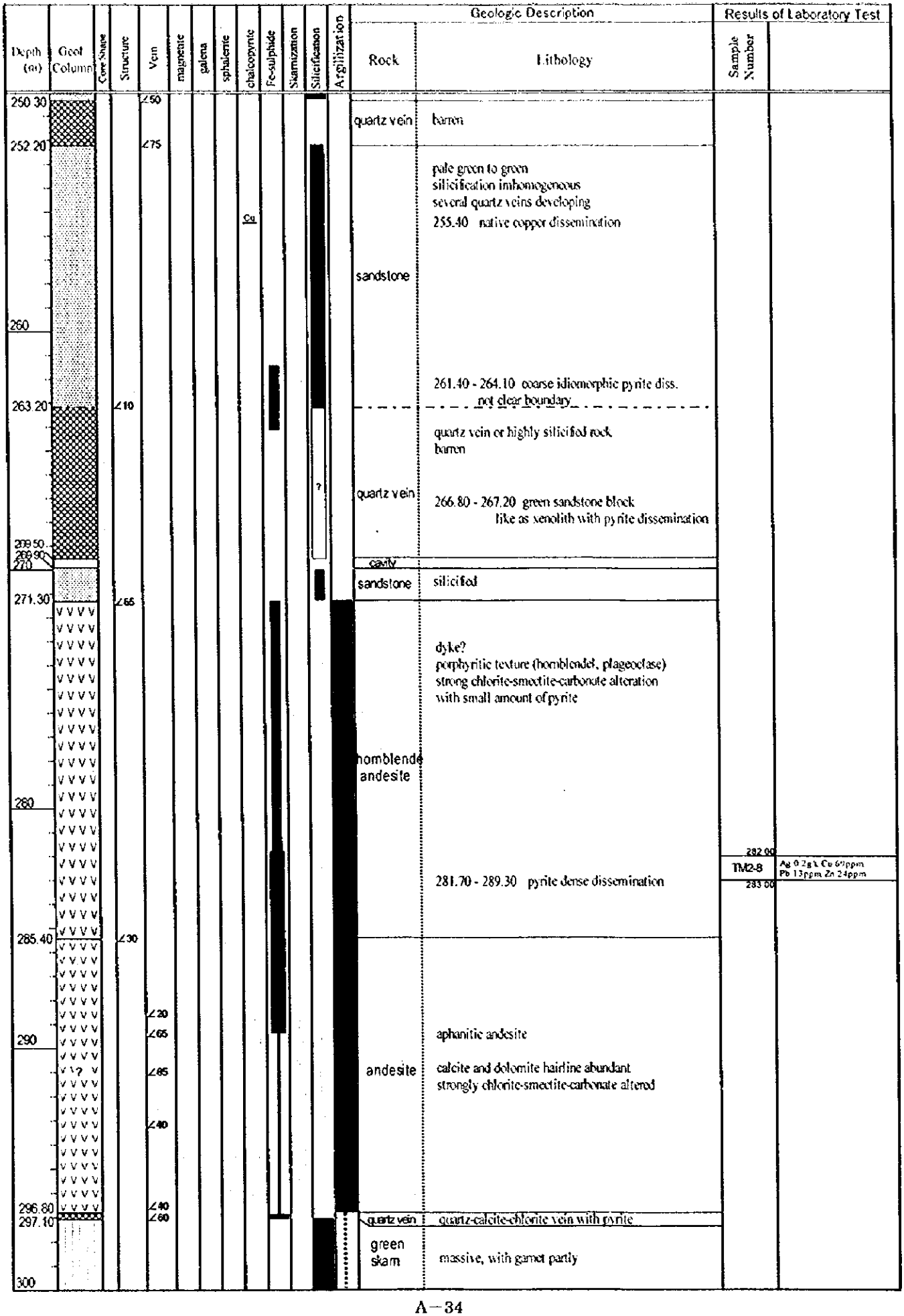
Mae Sariang, Thailand **MJTM-2** (Scale 1/200) (4/7) (Depth: 150m - 200m)



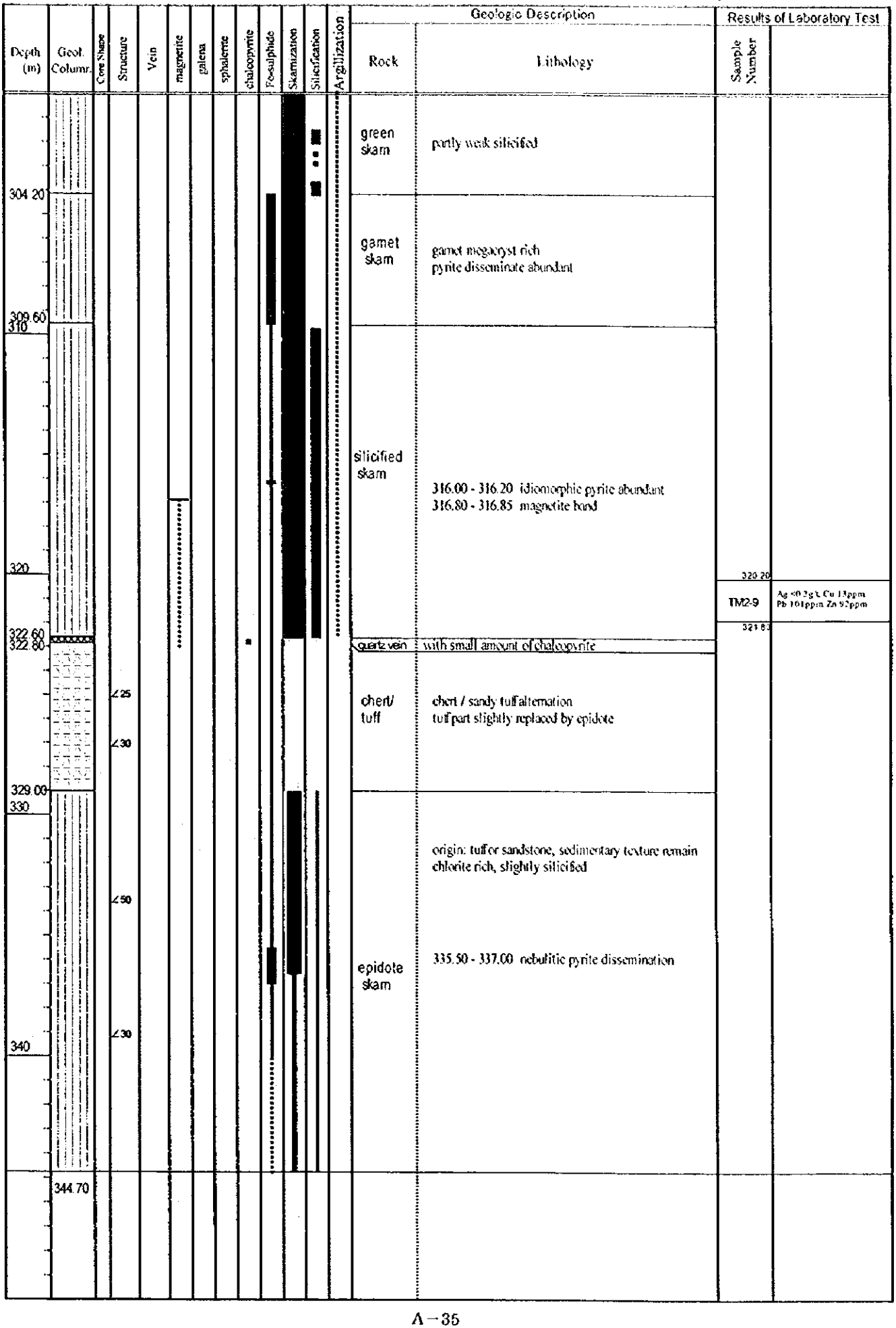
Mae Sariang, Thailand **MJTM-2** (Scale 1/200) (5/7) (Depth: 200m - 250m)



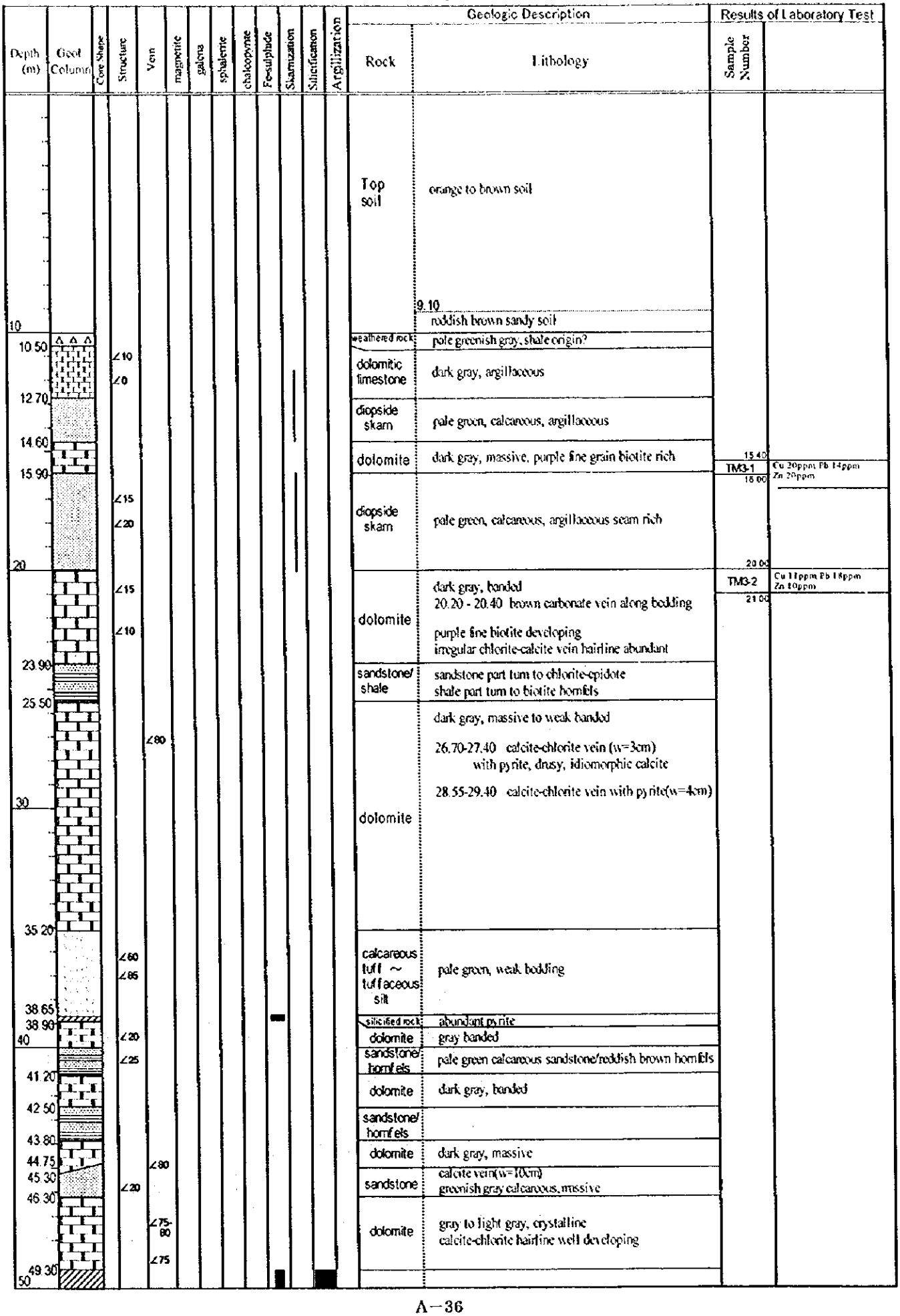
Mae Sariang, Thailand **MJTM-2** (Scale 1/200) (6/7) (Depth: 250m - 300m)



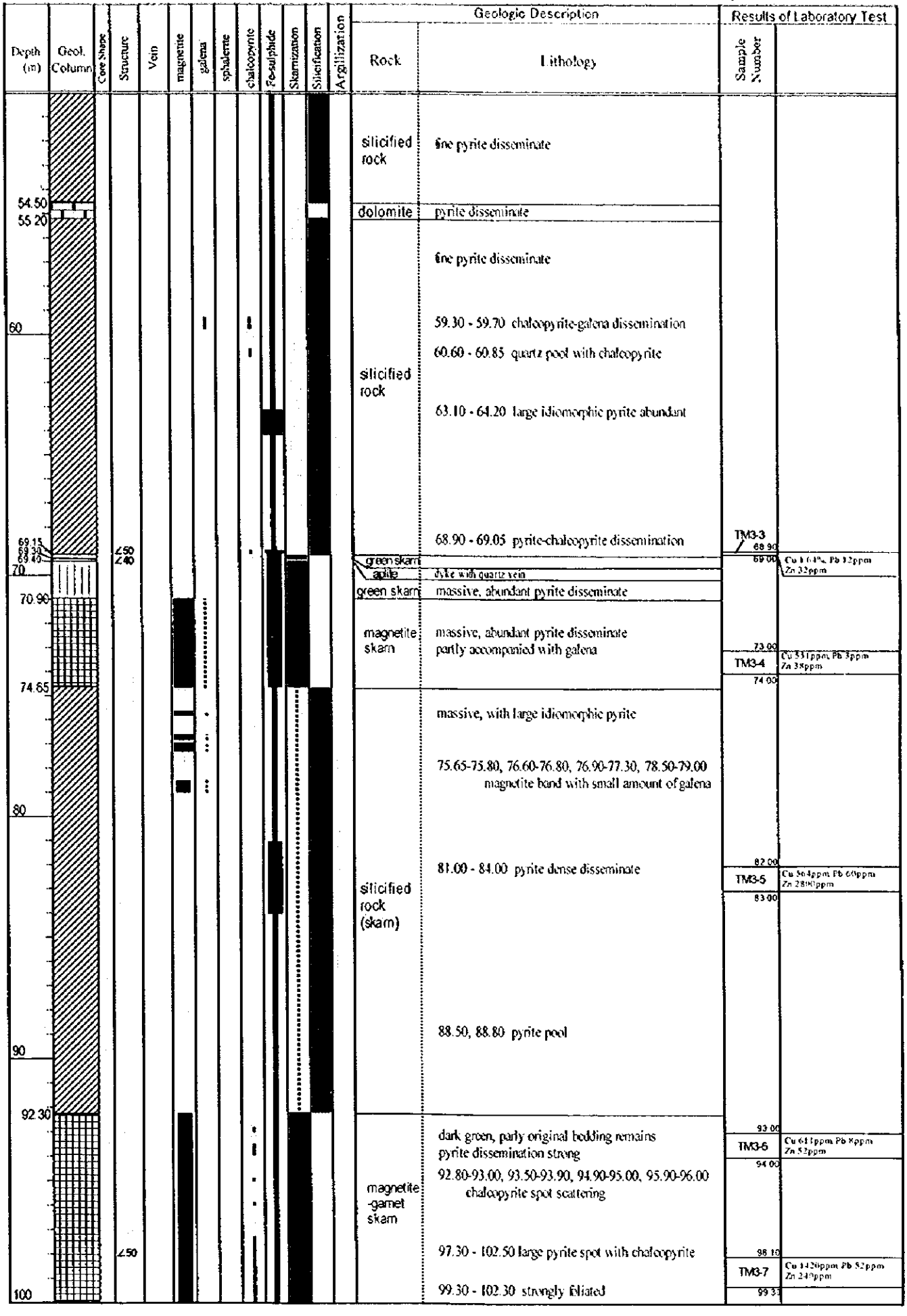
Mae Sariang, Thailand **MJTM-2** (Scale 1/200) (7/7) (Depth: 300m - 344.70m)



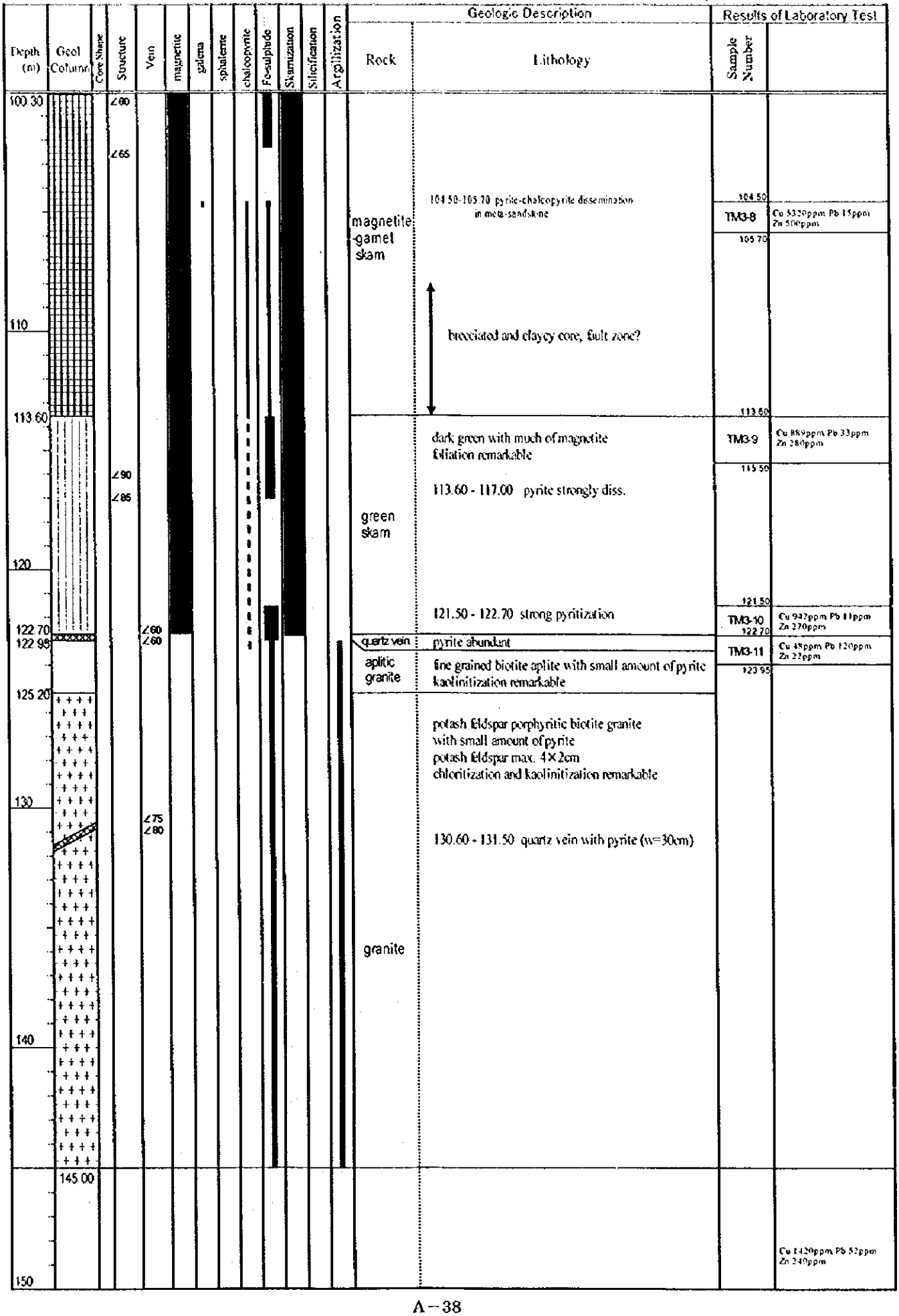
Mae Sariang Thailand **MJTM-3** (Scale 1/200) (1/3) (Depth: 0m - 50m)



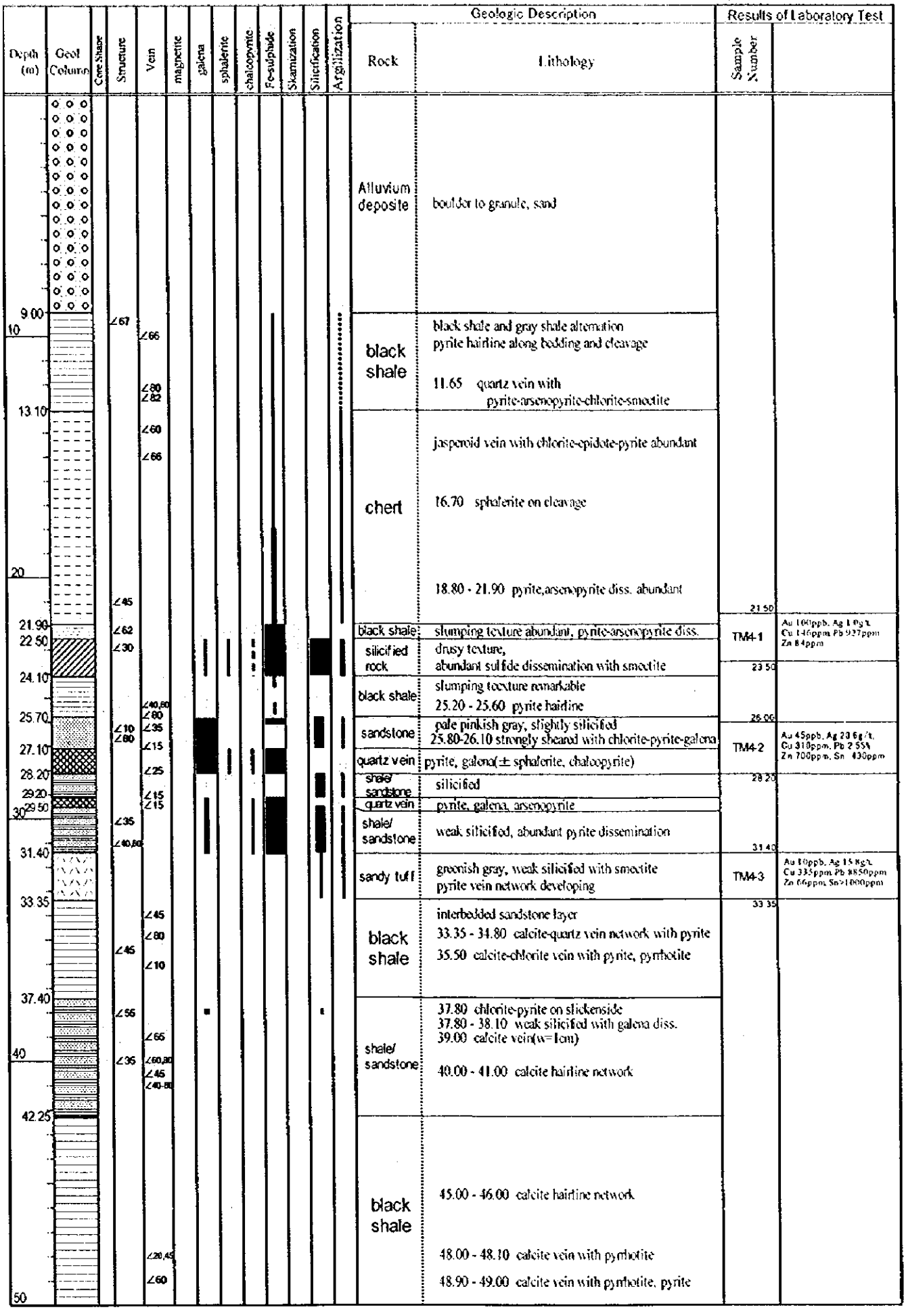
Mae Suriang Thailand **MJTM-3** (Scale 1/200) (2/3) (Depth: 50m - 100m)



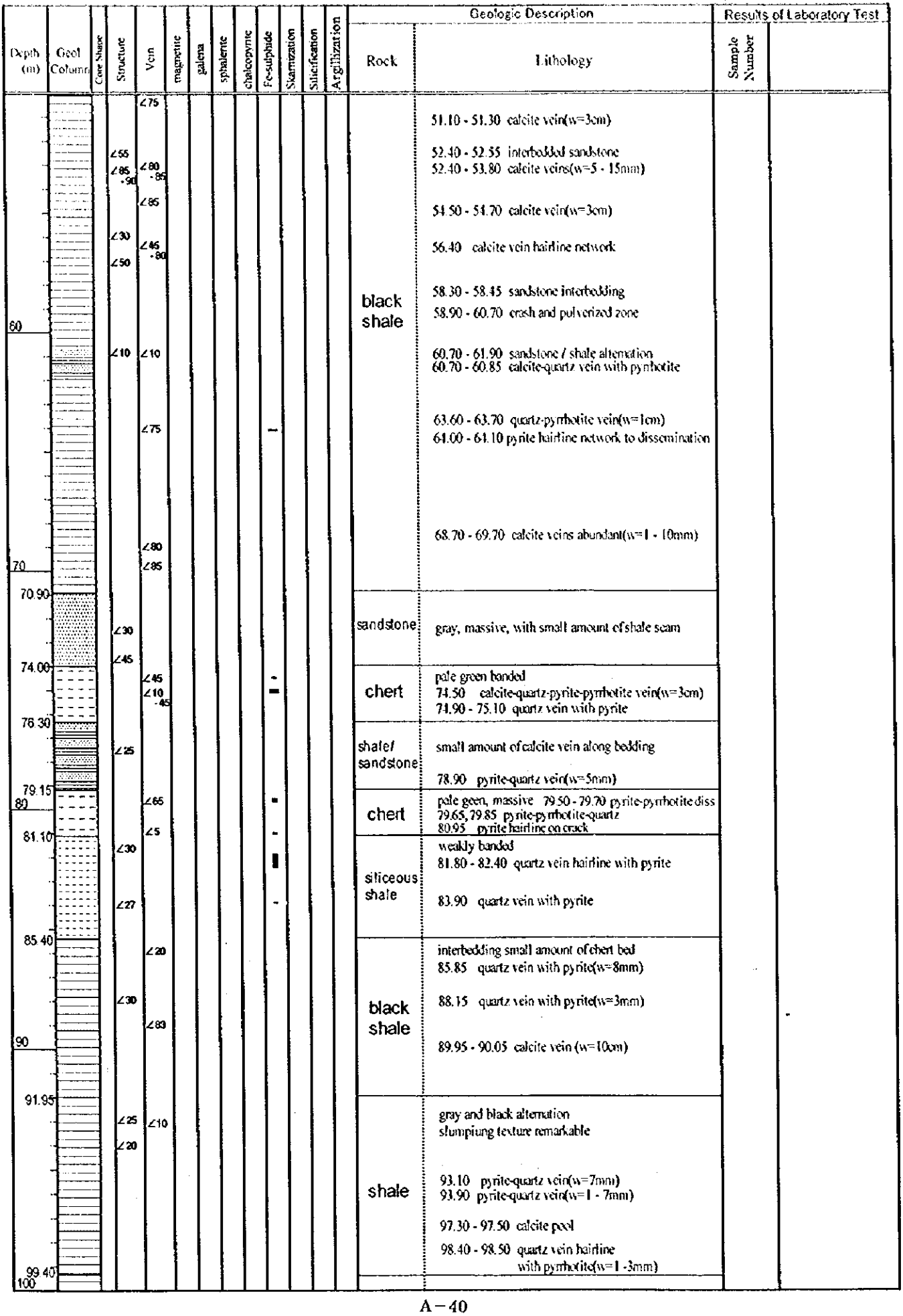
Mae Sariang Thailand **MJTM-3** (Scale 1/200) (3/3) (Depth: 100m - 145.00m)



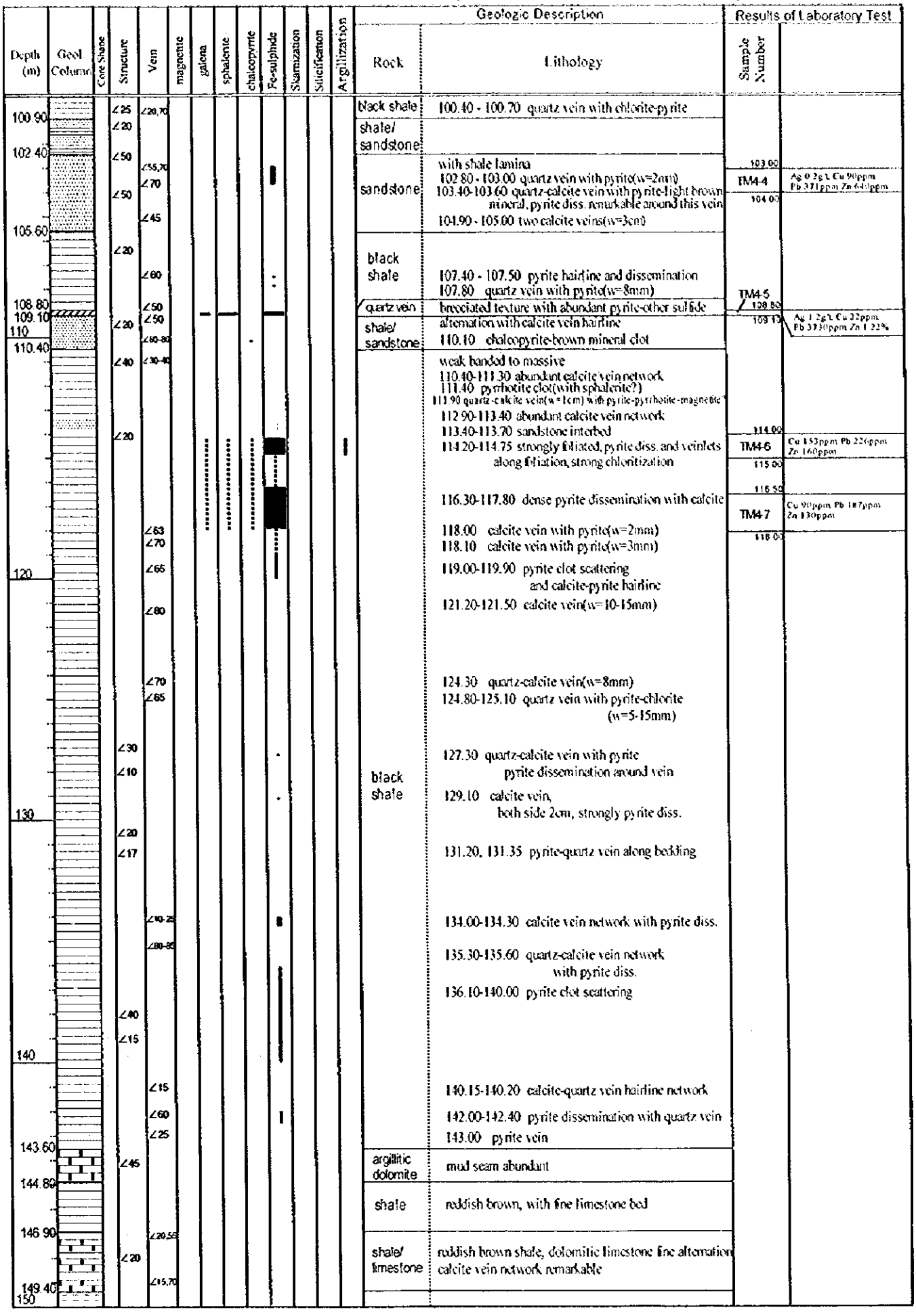
Mae Sariang Thailand **MJTM-4** (Scale 1/200) (1/5) (Depth: 0m - 50m)



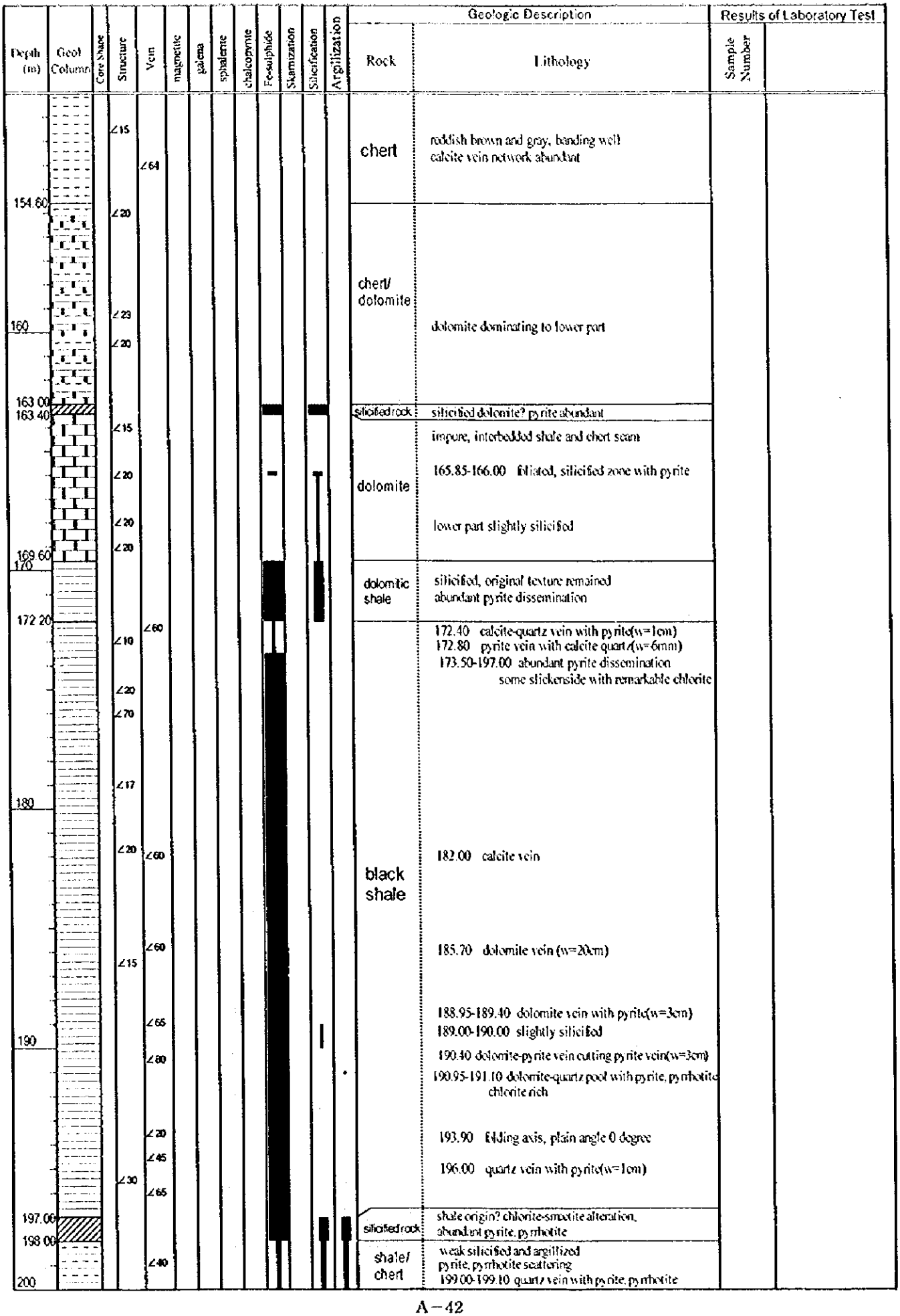
Mae Sariang Thailand **MJTM-4** (Scale 1/200) (2/5) (Depth: 50m - 100m)



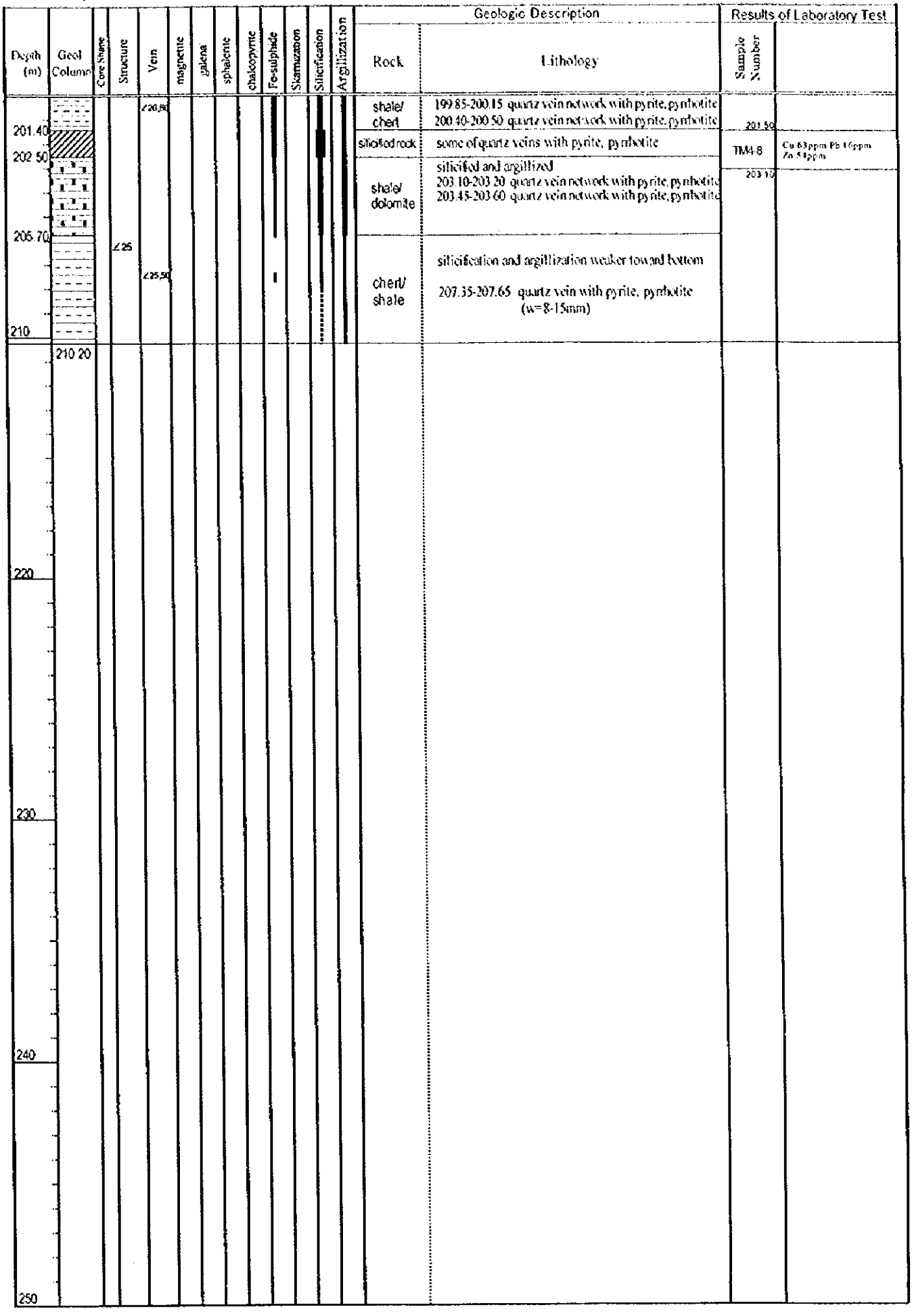
Mae Sariang, Thailand **MJTM-4** (Scale 1/200) (3/5) (Depth: 100m - 150m)



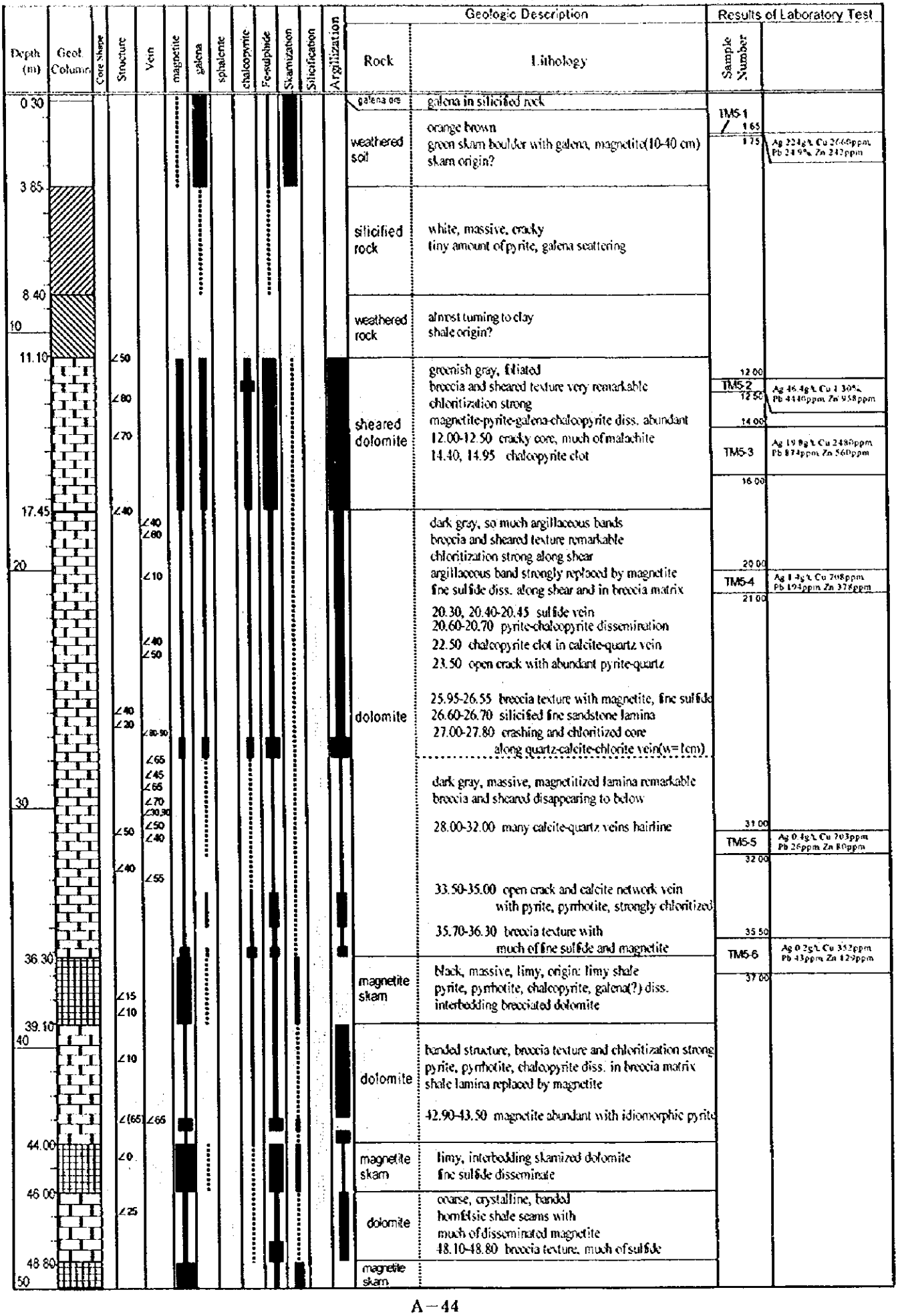
Mae Suriang Thailand **MJTM-4** (Scale 1/200) (4/5) (Depth: 150m - 200m)



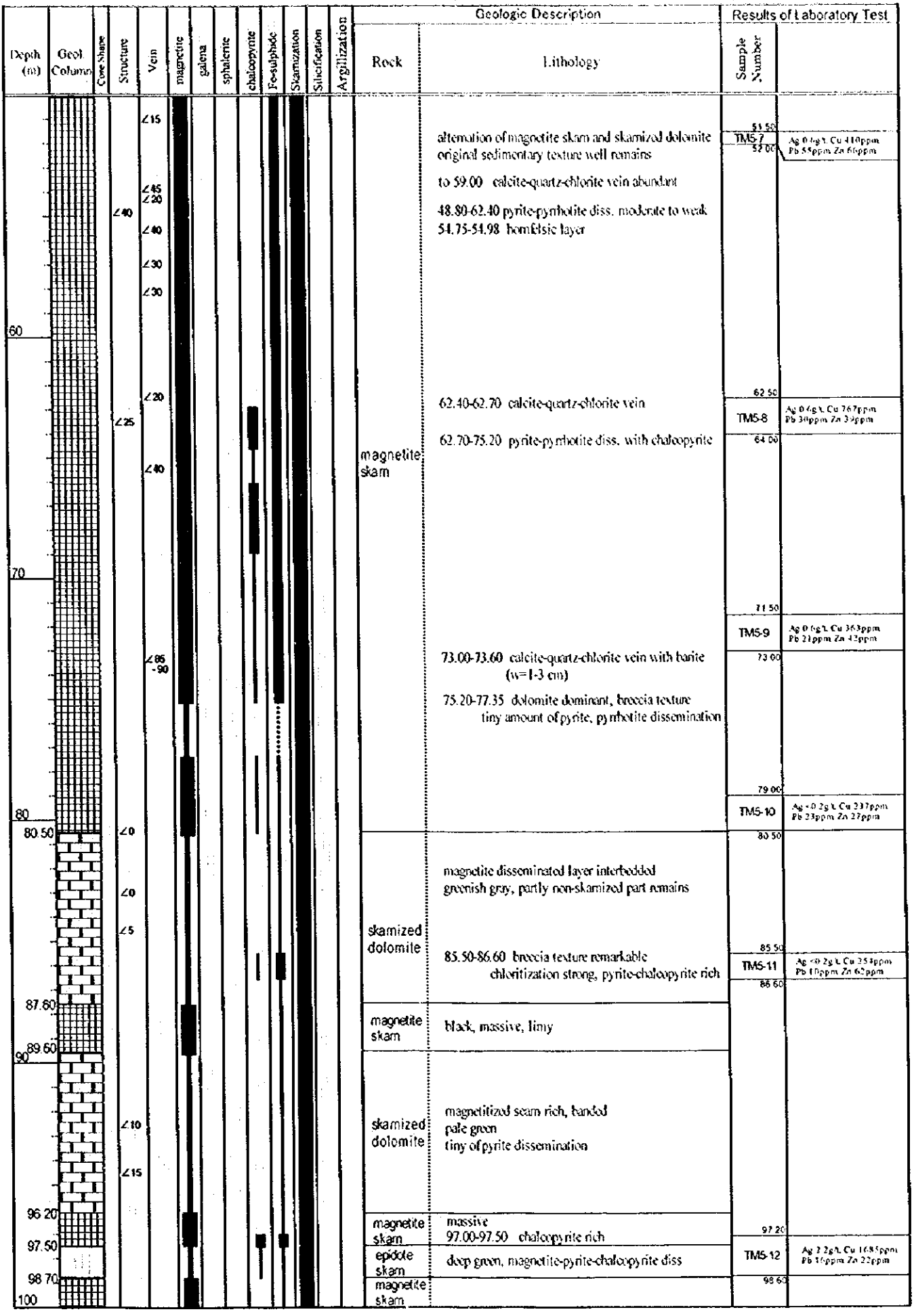
Mae Suriang, Thailand **MJTM-4** (Scale 1/200) (5/5) (Depth: 200m - 250m)



Mae Suring Thailand　　*MJTM-5*　　(Scale 1/200)　(1/2)　　(Depth: 0m - 50m)



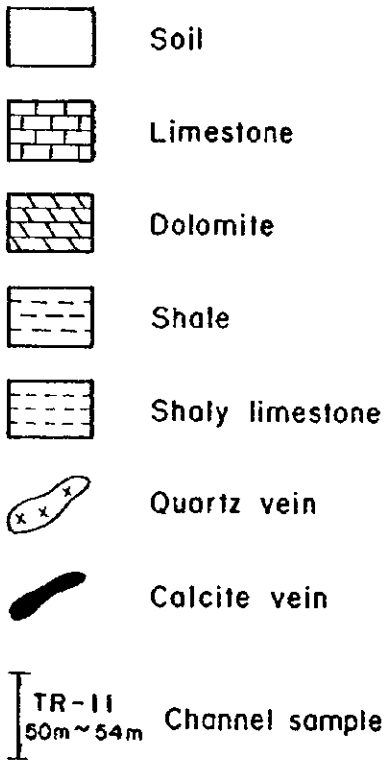
Mae Suriang Thailand **MJTM-5** (Scale 1/200) (2/2) (Depth: 50m - 100m)

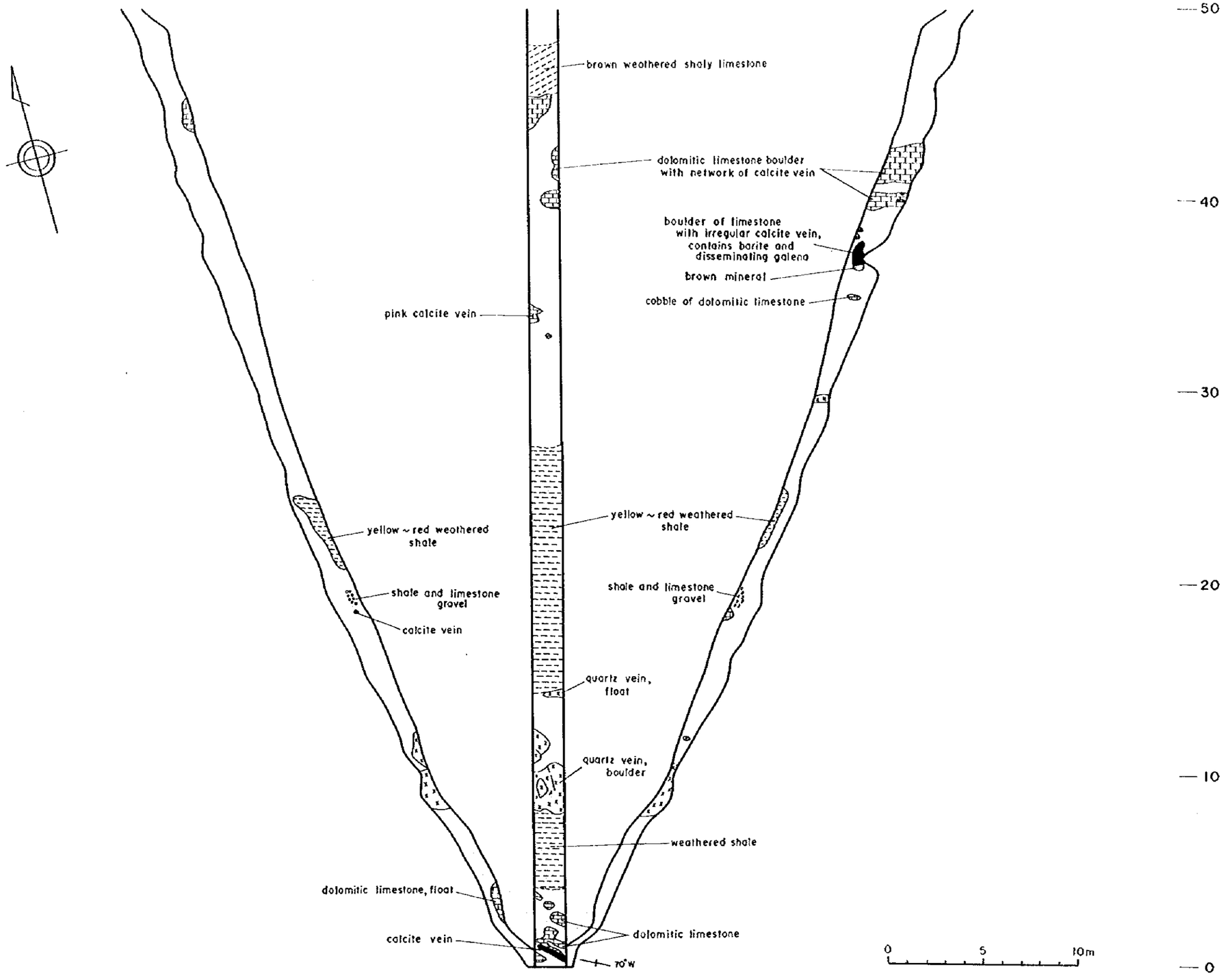


Appendix 13 Sketch of Trenching survey

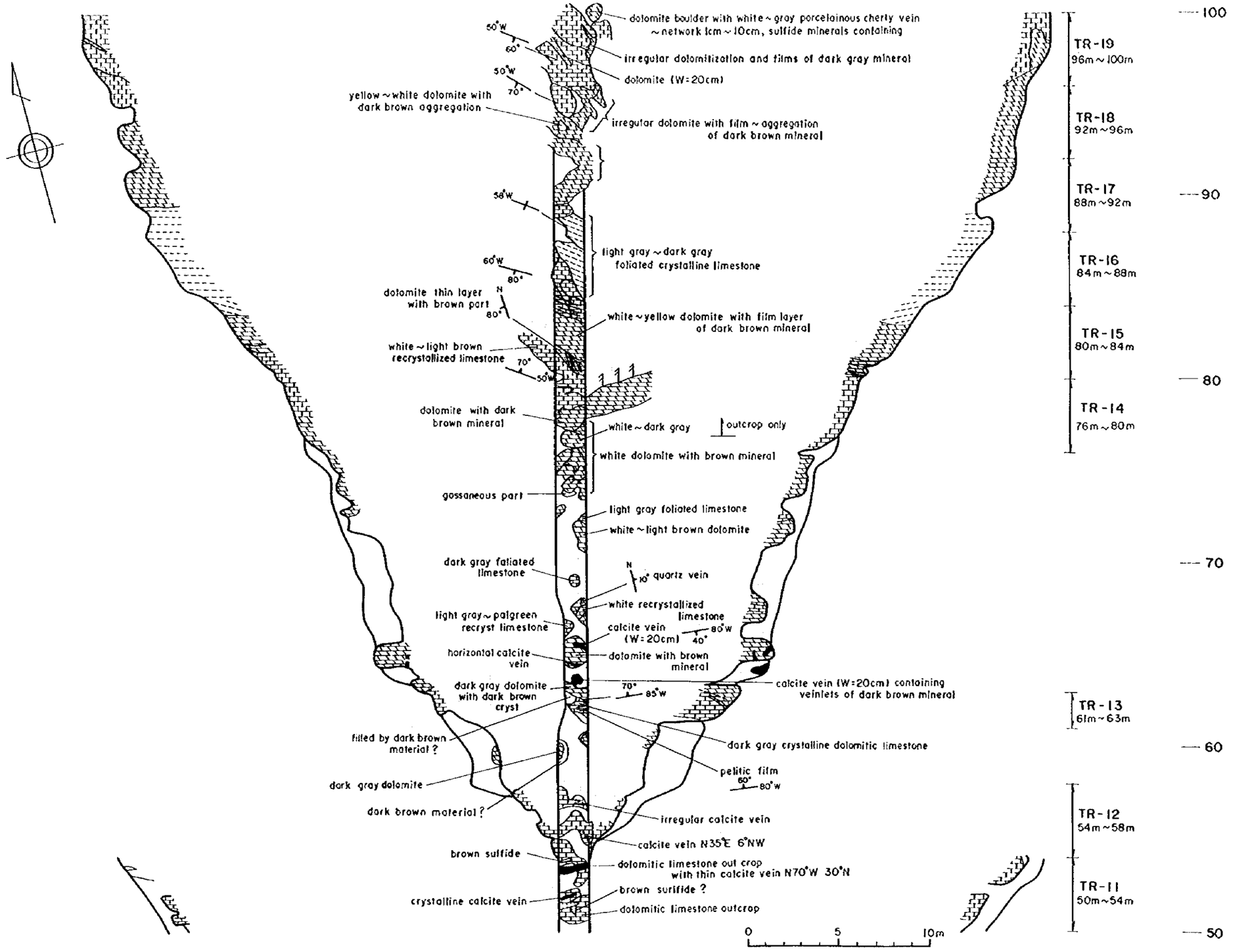
(Scale 1/200)

LEGEND

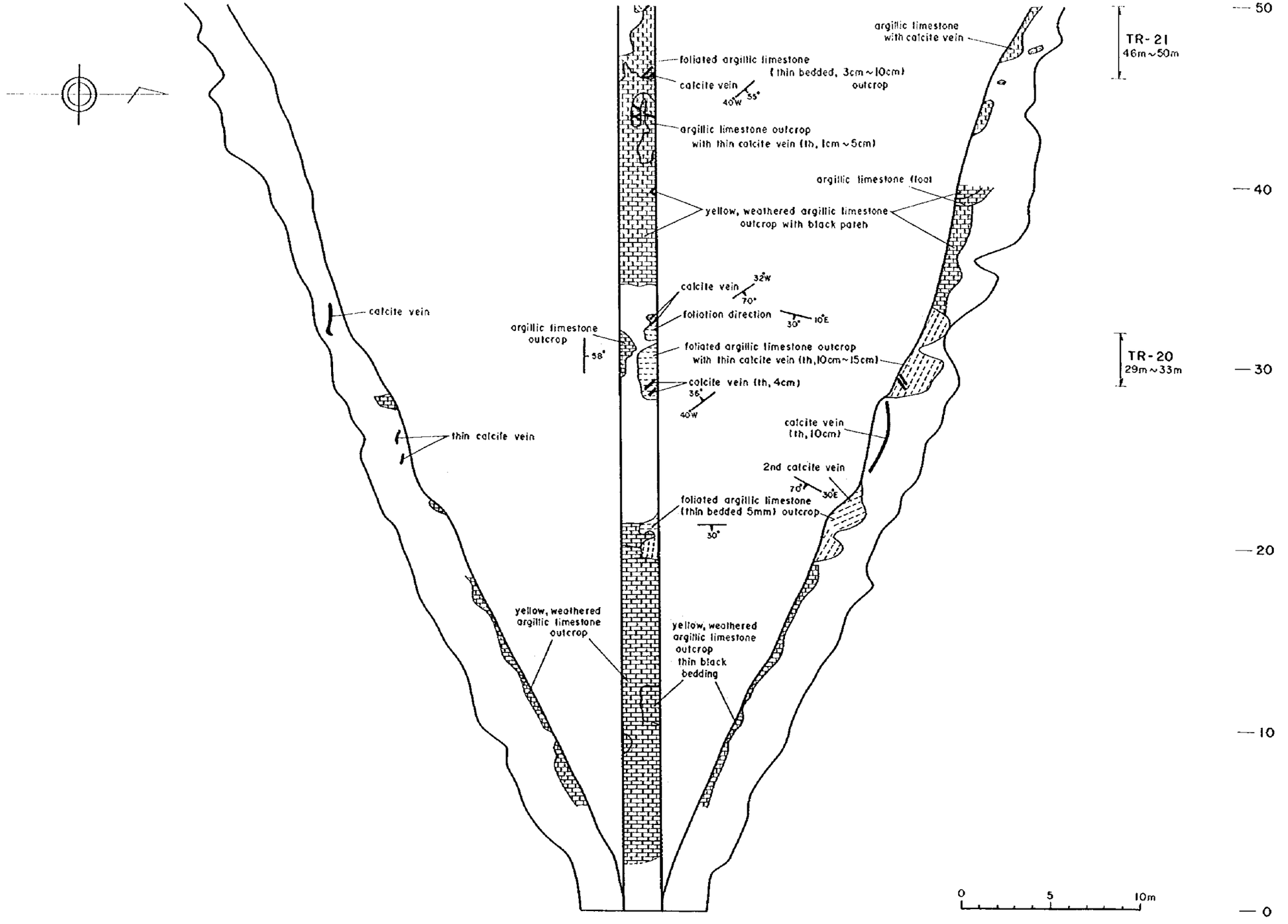




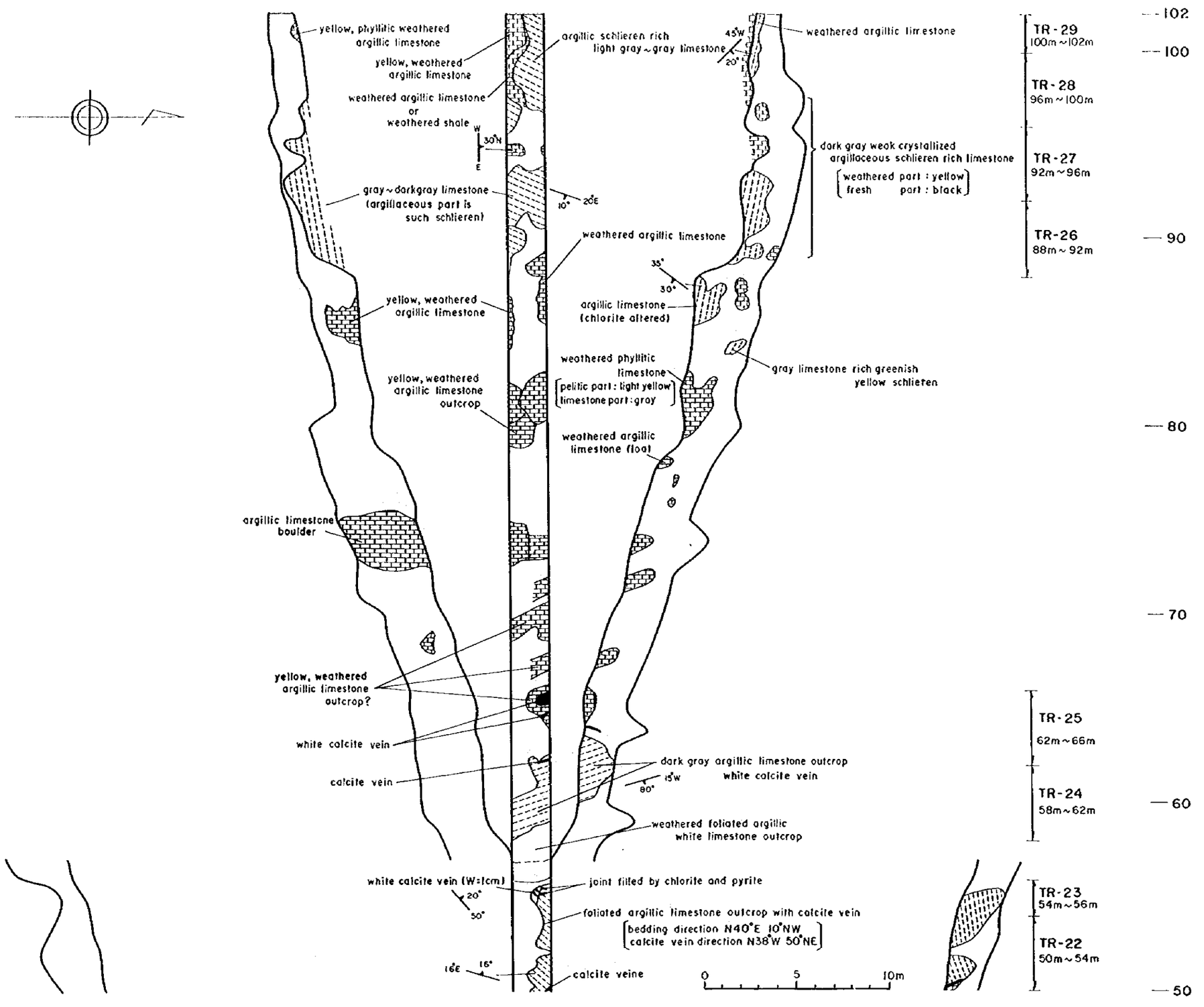
Trench - I (0m - 50m)



Trench - 1 (50m - 100m)



Trench-2 (0m - 50m)



Trench - 2 (50m - 102m)

Appendix 14 Homogenized Temperature and Salinity of Fluid Inclusion

No.	Sample No.	Locality	Description	Mineral	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	MJTM-1 68.60-68.65	Dong Noi area		Quartz	155	191	159	153	280																			
					2.2	2.1	2.1	1.0	2.4																			
2	MJTM-2 28.30-28.40	Dong Noi area		Quartz				330				113																
					0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1																
3	MJTM-2 252.30-252.40	Dong Noi area		Quartz	179	199	182	169	196	176	176	155	210	186	192	199	202	204	173	236	225	220	224	222				
																				1.1	1.2	10.1	7.6	3.2				
4	MJTM-3 60.60-60.70	Dong Noi area		Quartz	194	183	189	183	182	189	166	162	183	189	182	181	181	165	171	195	195	185						
					10.5	8.9		11.7	0.8		7.7												12.6					
5	MJTM-3 122.80-122.91	Dong Noi area		Quartz	176	173	175	174	176	175	177	176	201	202	194	186	171	165	184	184								
					1.0	1.0	1.2	1.0	1.0	1.0	1.2	1.2	1.2	1.2	1.2	1.0	1.0	1.0	1.0	1.0								
6	MJTM-3 122.80-122.91	Dong Noi area		Quartz	129	174	176																					
					1.0	1.2	1.0																					
7	MJTM-4 103.40-103.45	I-4 area		Quartz	114	101	103	105	108	114	110	168	113															
8	MJTM-4 202.10-202.30	I-4 area		Quartz	325	187	316	236	318	81	258	275	226	244	249	271	273	268	306	>340	339	275						
																			0.0	4.7	0.0	0.7						
9	MJTM-5 31.15-31.20	Dong Noi area		No fluid inclusions for measurement																								
10	MJTM-5 73.00-73.50	Dong Noi area		Gypsum		broken 250°C			broken 250°C																			
					0.0	0.0	0.1	0.0	0.0																			
11	DJ-13	Dong Noi area		Calcite	176	175	138	141	143	143																		
12	DKR-01	Dong Noi area		Quartz	182	153	147	142	186	155	153	153	159	232	176	191												
					0.7	0.7	0.7	0.7	0.7	0.5	0.7	0.5	0.7	0.7	0.5	0.7												
13	JR-001	Southern I-4		Quartz	212	292	310	216	287																			
					0.7	0.8	0.7	0.8	0.7																			
14	MM-02	Huai Wak		Quartz	188	168	157	304	161	177	154			200	263	208	211	218	211	307	275		298	241	239	344	273	
								0.1	1.5	1.5	0.0	6.2	6.0	0.5	6.0							15.3	19.7	18.2	13.6	6.2	2.9	3.2
15	MM-06	Huai Wak		No fluid inclusions for measurement																								
16	TR1-97	Dong Noi area		Quartz	171	169	168	155	169	169	191	187	258	187	199													

Upper: homogenized temperature unit:°C

Lower: salinity unit: wt% NaCl equivalent

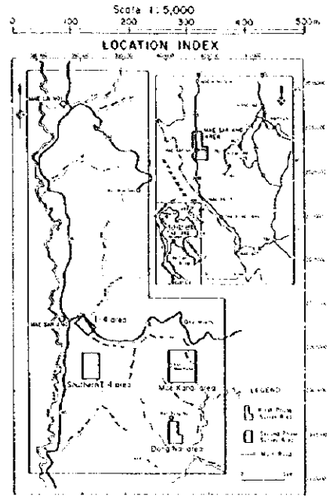
Appendix 15 Result of Stable Isotope Analysis

	Sp. No.	Description	Locality	$\delta^{13}C_{PDB}$ (‰)	$\delta^{18}O_{PDB}$ (‰)	$\delta^{18}O_{SMOW}$ (‰)
1	AR-011	muddy limstone, honfelsic	Pha Deang, Mae Sod mine	+1.4	−12.3	+18.2
2	AR-013	muddy limstone	Pha Deang, Hua Long mine	+0.9	−10.0	+20.6
3	AR-015	grey recrystalline limestone	Tak Mining	+2.0	−6.2	+24.5
4	AR-009	beside of barite vein, white massive limestone	Chamrat barite mine	−2.1	−22.0	+8.2
5	AR-033	grey recrystalline massive limestone	Dong Noi area	−1.3	−14.1	+16.3
6	BR-032	light green banded marble	Dong Noi area	+1.0	−15.3	+15.1
7	AR-041	recrystallized calcite in cavity	I-4 area	−4.1	−5.8	+24.9
8	BR-047	dark grey banded limestone	I-4 area	−2.5	−13.0	+17.5
9	DR-028	light brown banded marble	I-4 area	−2.9	−11.1	+19.4
10	DJ-09	muddy dolomitic limestone	Dong Noi area	−2.7	−10.3	+20.3
11	DM-12	crystalline limestone	Dong Noi area	−0.4	−14.0	+16.4
12	MJ-04	muddy dolomitic limestone	Mae Kanai area	−1.8	−12.3	+18.2
13	MMR-04	calc-silicate rock	Mae Kanai area	−14.7	−19.8	+10.4
14	MMR-13	muddy limstone	Mae Kanai area	−0.8	−23.9	+6.3
15	MJTM-1	crystalline dolomite	MJTM-1 60.40-60.45	−4.1	−23.3	+6.9
16	MJTM-2D	impure dolomite	MJTM-2 18.00-18.10	−2.1	−11.6	+19.0
17	MJTM-2S	skarnized dolomite	MJTM-2 130.00-130.10	−4.4	−20.7	+9.6
18	MJTM-3	impure dolomite with hornfelsic seam	MJTM-3 15.00-15.20	−3.4	−15.7	+14.7
19	MJTM-4	massive dolomite	MJTM-4 104.50-104.60	−2.3	−18.5	+11.8

PL - 1

MINERAL EXPLORATION OF MAE SARIANG
OF

Geologic map and profile in Dong Noi area



JAPAN INTERNATIONAL COOPERATION AGENCY
METAL MINING AGENCY OF JAPAN

MARCH 1999

97 99 00 01 97

96 96

95 95

A A'

B B'

Dai Dong Luang

MJTM-1 MJTM-2 MJTM-3 MJTM-5

Trench No.1 Trench No.2

G Os Ol a CB Qv Fe

LEGEND

1. Sedimentary rocks

Quaternary	Q	alluvium
Ordovician	Ol	limestone
	Os	shale
Cambrian	CB	sandstone (quartz arenite)

2. Igneous rocks

Triassic	G	biotite granite
	V	andesite dike

3. Geologic symbols

- Fault
- Fault (inferred)
- Strike and dip
- MJTM-1 Drill hole
- Trench No.1 Trench survey
- A — A' Profile line

4. Mineral occurrence

- Pb Galena float
- Fe Gossaneous float
- Qv Quartz boulders
- Dolomitization
- Skarnization

4. Mineral occurrence

- Pb — Galena float
- Fe — Gossaneous float
- Qz — Quartz boulders
- Dolomitization
- Skarnization

94 99 00 01 94

Os Ol G CB

MJTM-1 MJTM-2 MJTM-3 MJTM-5 Trench No 2

A A′ B B′ C C′

West East North South

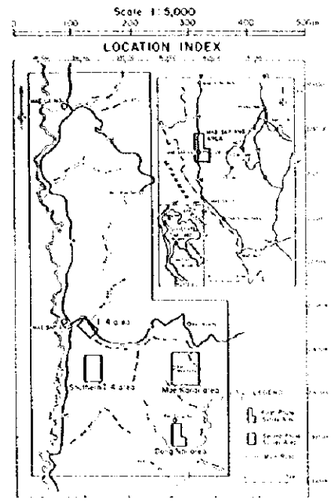
1200m 1100 1000 900 800 700

1 : 5,000

0 100 200 300 400 500m

M'NERAL EXPLORATION OF MAE SARIANG
OF

Locality map of Rock samples in Dong Noi area



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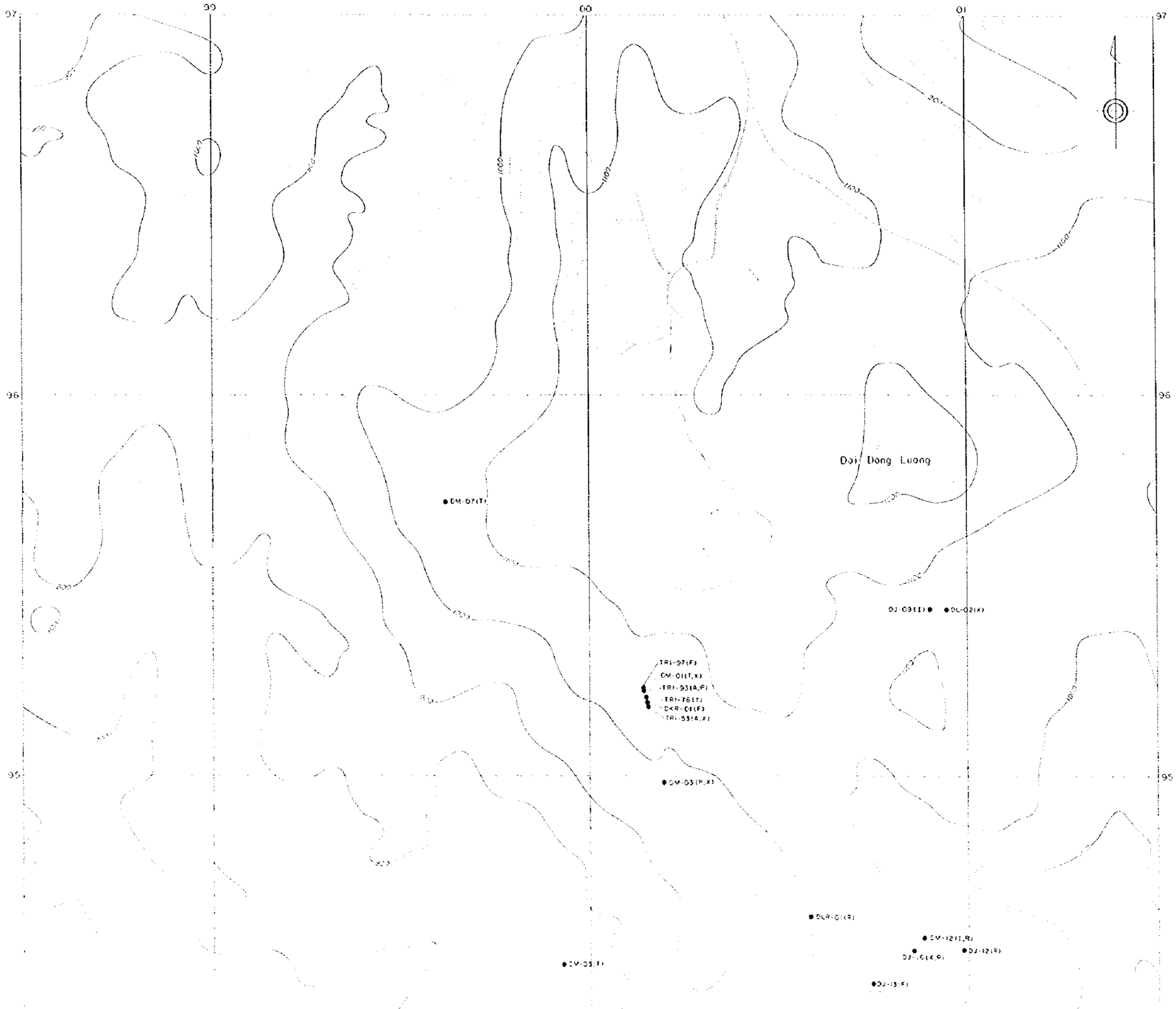
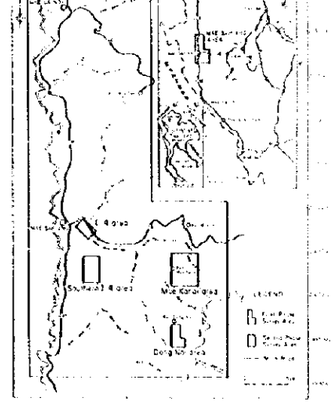


LEGEND

Rock Sample ● DM-01 (A, P, T, X, I, F, R)

- A : Ore Analysis
- P : Polished Section
- T : Thin Section
- X : X-ray Diffraction Test
- I : Stable Isotope Analysis (δC, δO)
- F : Fluid Inclusion Test
- R : Resistivity and Chargeability Test



JAPAN INTERNATIONAL COOPERATION AGENCY
METAL MINING AGENCY OF JAPAN

MARCH 1999

Doi Dong Luang

DM-07(T)
DJ-09(T)
DL-02(X)
TRI-97(F)
DM-01(T,X)
TRI-93(A,P)
TRI-76(T)
DKR-01(F)
TRI-53(A,X)
DM-03(P,X)
DKR-01(R)
DM-05(T)
DM-12(I,R)
DJ-16(X,R)
DJ-12(R)
DJ-13(F)
DJ-14(X)
DD-03(T,S)

LEGEND

Rock Sample ● DM-01 (A,P,T,X,I,E,R)

A : Ore Analysis
P : Polished Section
T : Thin Section
X : X-ray Diffraction Test
I : Stable Isotope Analysis (δC, δO)
F : Fluid Inclusion Test
R : Resistivity and Chargeability Test

99 00 01

95 94

1 : 5,000

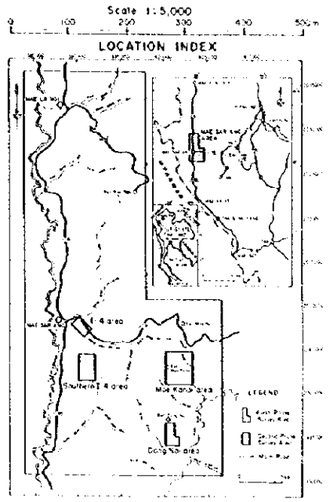
0 100 200 300 400 500m


Doi Khun Mae Kanai
Ban Mae Kanai
Ban Sam Lung
00
01
02
05
04
03
A
B
S-Ds
S-Dℓ
Os
Oℓ
G
Fe
Q
East
A'
B'
1100m
1000
900
800
700

PL - 3

MINERAL EXPLORATION OF MAE SARIANG
OF

Geologic map and profile in Mae Kanai area



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METAL MINING AGENCY OF JAPAN

MARCH 1999

LEGEND

1. Sedimentory rocks

Quaternary	a	alluvium
Devonian – Silurian	S-Dl	limestone
	S-Ds	sandstone
Ordovician	O-Ol	limestone
	O-Os	shale, sandstone

2. Igneous rocks

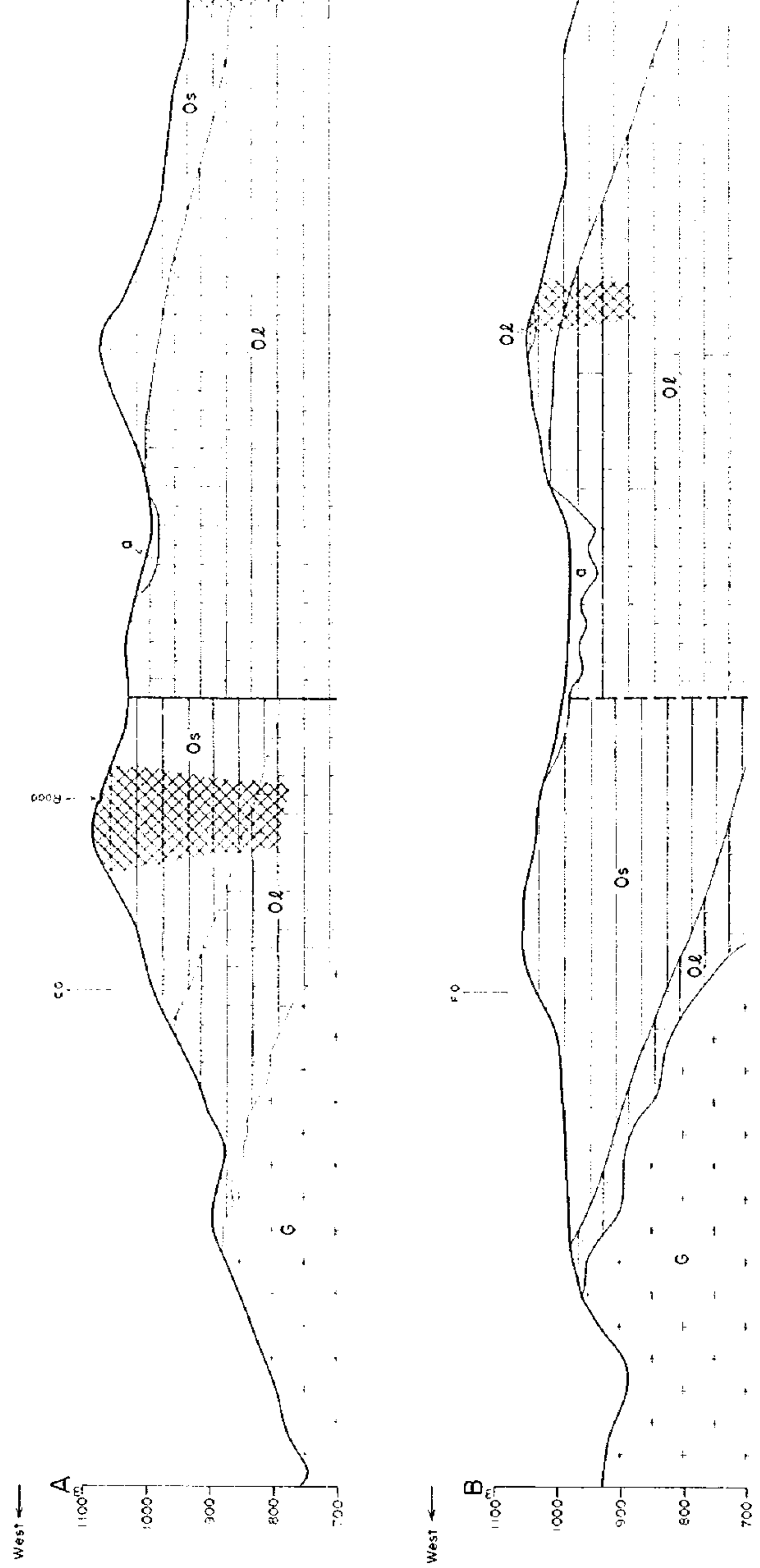
Triassic	G	biotite granite

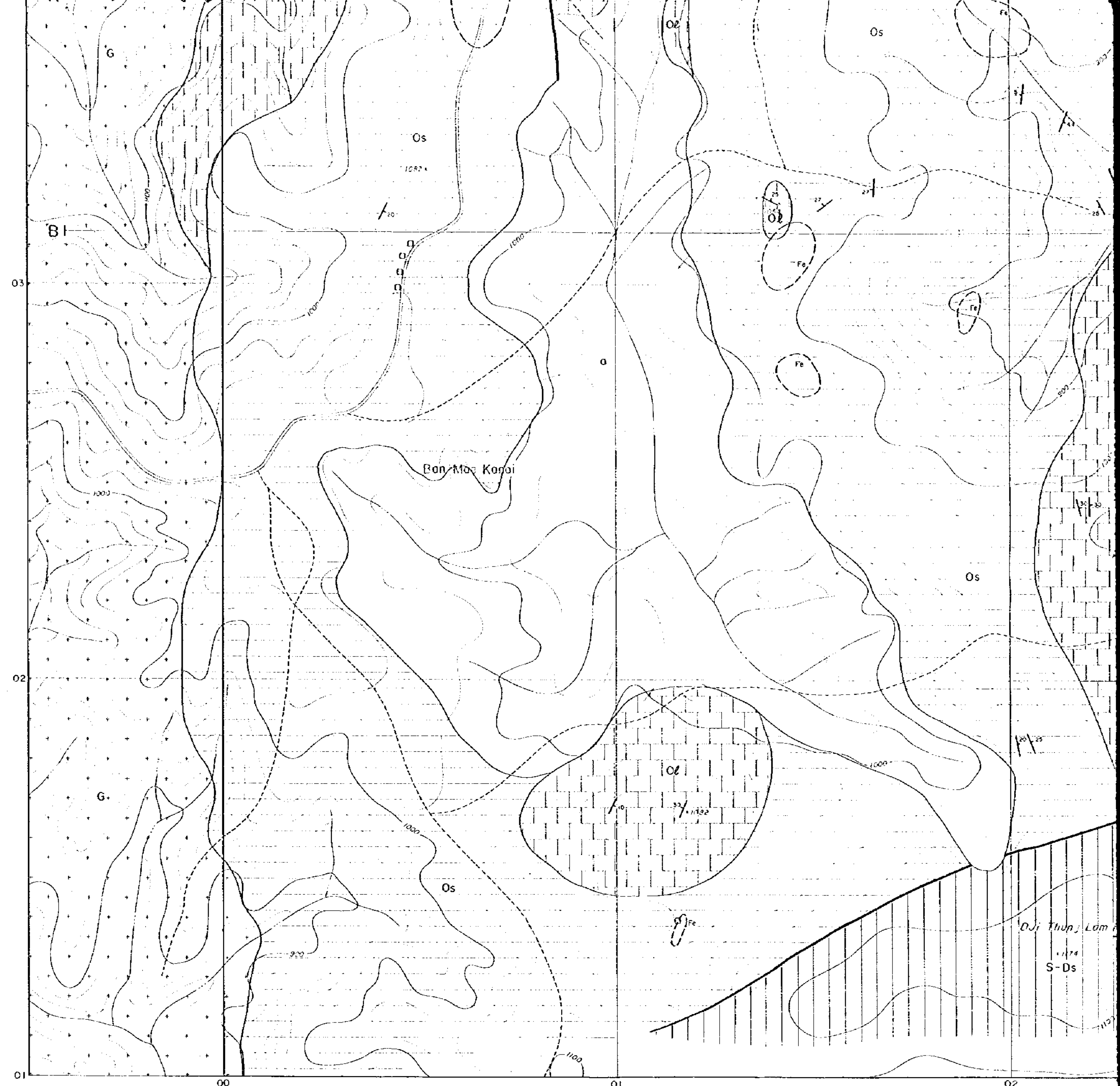
3. Geologic symbols

- Fault
- Strike and dip
- A—A' Profile line

4. Mineral occurrence

- calc – silicate rich part
- Fe gossaneous zone
- magnetite float
- sulfide mineralization


West
A
B
Os
Oℓ
G
a
1100
1000
900
800
700


Ban Mac Kanai
Os
Oℓ
G
a
Fe
S-Ds
B
00
01
02
03
1000
900
1100

LEGEND

1. Sedimentary rocks

Quaternary	a	alluvium
Devonian – Silurian	S-Dℓ	limestone
	S-Ds	sandstone
Ordovician	Oℓ	limestone
	Os	shale, sandstone

2. Igneous rocks

Triassic	G	biotite granite

3. Geologic symbols

- Fault
- Strike and dip
- A—A' Profile line

4. Mineral occurrence

- calc - silicate rich part
- Fe gossaneous zone
- magnetite float
- sulfide mineralization

Ban Mae Kamai

Doi Thung Lom Phu

1174

S-Ds

Os

Oℓ

a

B'

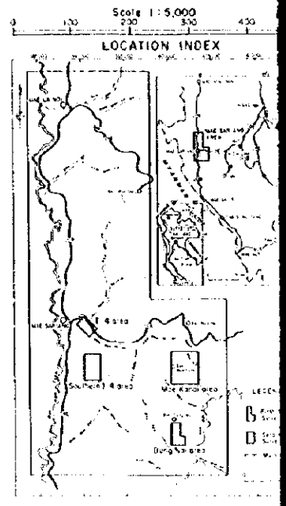
1 : 5,000

0 100 200 300 400 500 m

00 01 02 03

MINERAL EXPLORATION OF MAE
OF

Locality map of Rock samples in Mae



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MARCH 1999

Doi Khun Mae Kanai

Ban Sam Lung

Ban Mae Kanai

Huai Mae Ha

LEGEND

Rock Sample ● MMR-01(A,P,T,X,I,F

A : Ore Analysis

P : Polished Section

T : Thin Section

X : X-ray Diffraction Test

I : Stable Isotope Analysis (δC, δO)

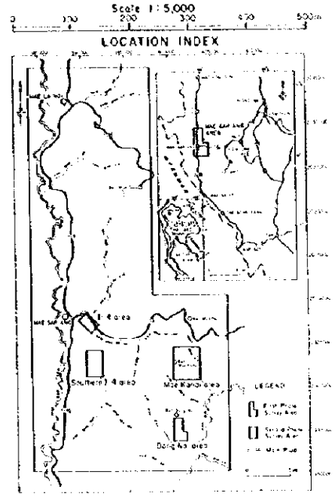
F : Fluid Inclusion Test

R : Resistivity and Chargeability Test

PL - 4

MINERAL EXPLORATION OF MAE SARIANG
OF

Locality map of Rock samples in Mae Kanai area



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00 01 02 03 04 05

Ban Sam Lung

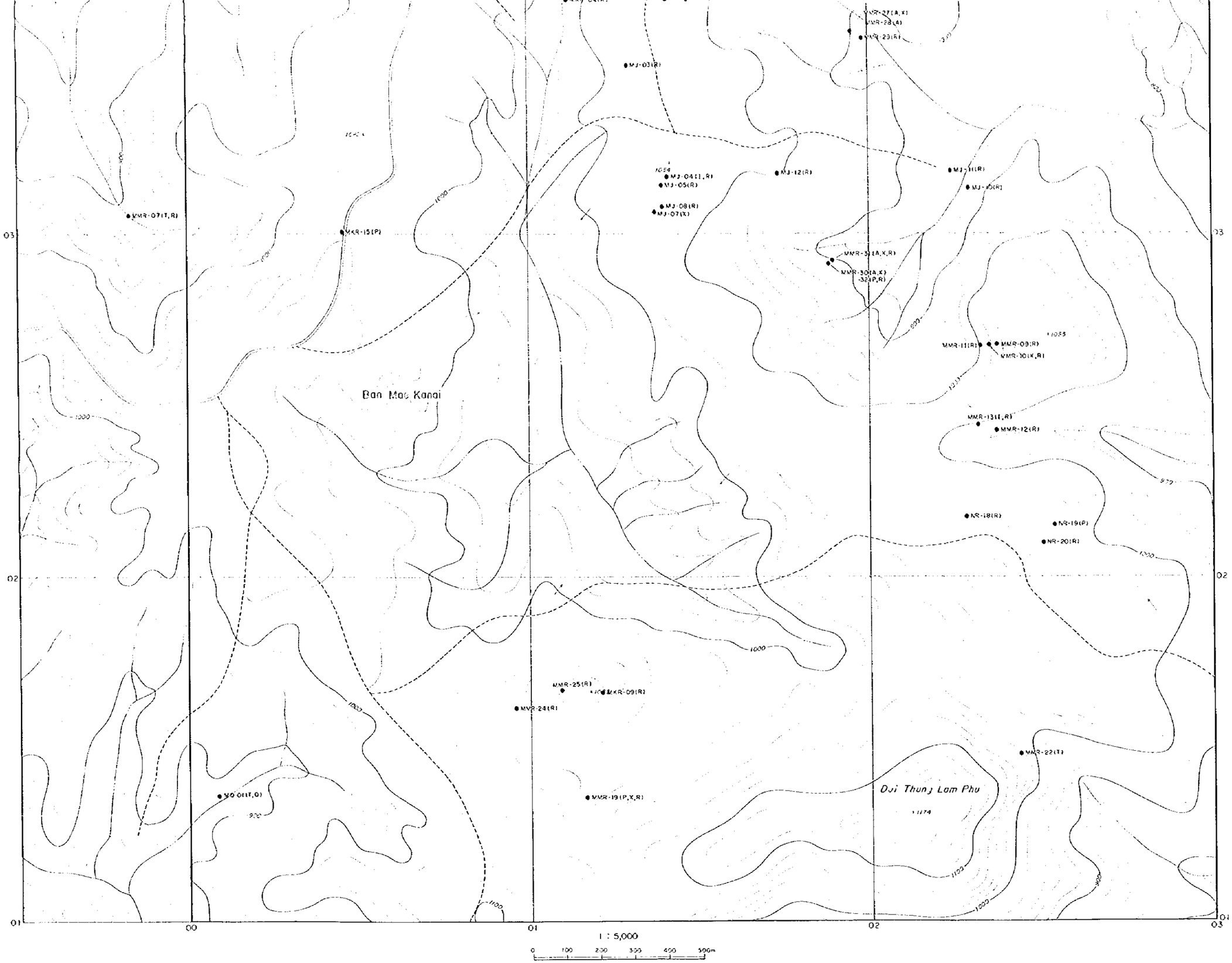
Ban Mae Kanai

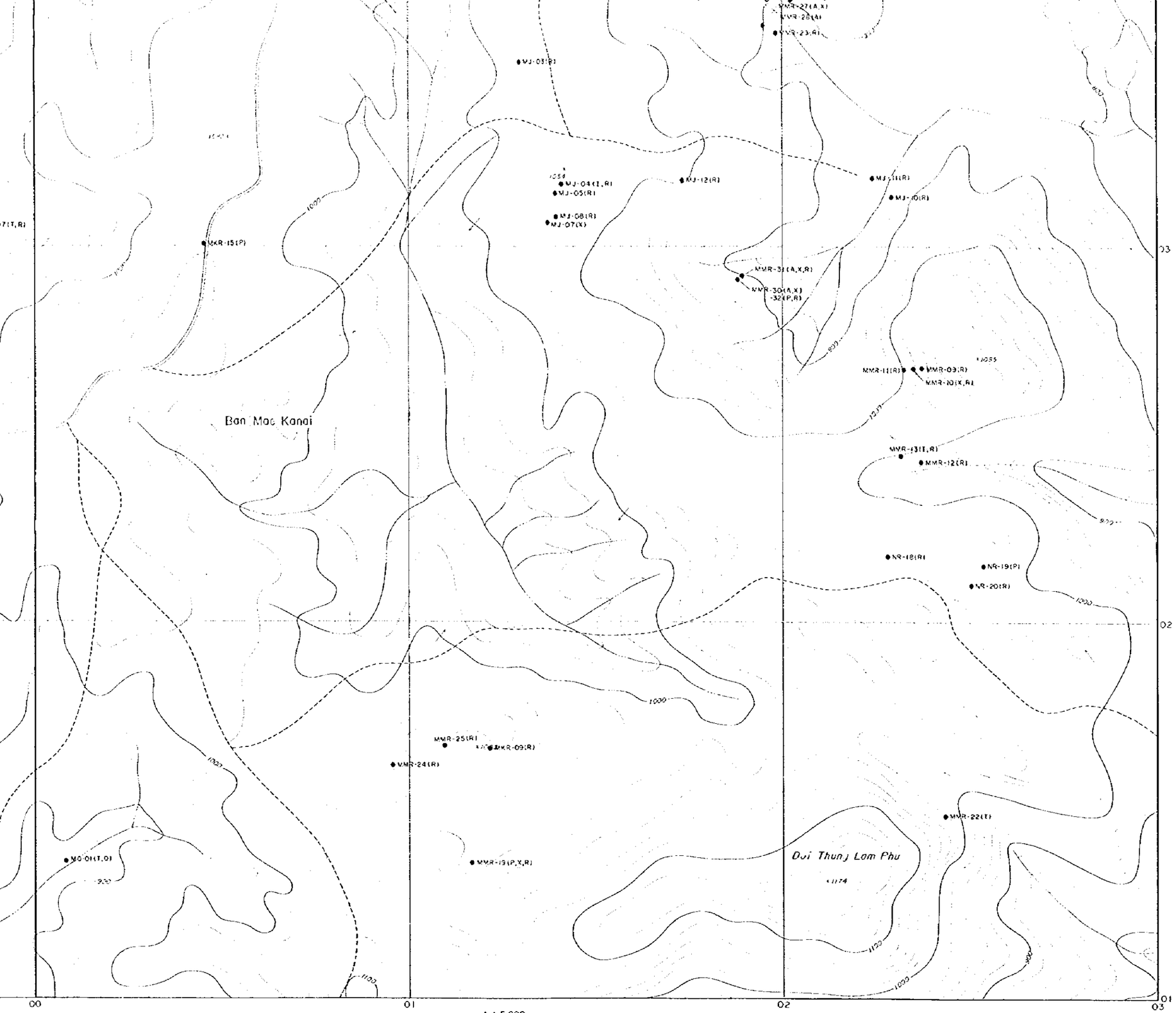
MJ-13(R)
MKR-04(R)
MJ-03(P)
MKR-15(P)
MJ-04(T,R)
MJ-05(R)
MJ-08(R)
MJ-07(X)
MJ-12(R)
MJ-11(R)
MJ-10(R)
MMR-15(R)
MMR-26(A,X)
MMR-27(A,X)
MMR-28(A)
MMR-29(R)
MMR-31(A,X,R)
MMR-30(A,X)
-32(P,R)
MMR-11(R)
MMR-09(R)
MMR-10(X,R)
MMR-13(T,R)
MMR-12(R)
MJ-02(R)
MMR-03(T,R)
MMR-04(T,F,R)
MMR-05(T)
MJ-01(R)
MJ-07(T,R)
Mae Ho

LEGEND

Rock Sample ● MMR-01 (A,P,T,X,I,F,R)

A : Ore Analysis
P : Polished Section
T : Thin Section
X : X-ray Diffraction Test
I : Stable Isotope Analysis (δC, δO)
F : Fluid Inclusion Test
R : Resistivity and Chargeability Test


LEGEND
Rock Sample ● MMR-01(A,P,T,X,I,F,R)
A : Ore Analysis
P : Polished Section
T : Thin Section
X : X-ray Diffraction Test
I : Stable Isotope Analysis (δC, δO)
F : Fluid Inclusion Test
R : Resistivity and Chargeability Test
Ban Mac Kanai
Doi Thung Lam Phu
MMR-01(T,R)
MKR-15(P)
MJ-03(R)
MJ-04(I,R)
MJ-05(R)
MJ-08(R)
MJ-07(X)
MJ-12(R)
MJ-11(R)
MJ-10(R)
MMR-27(A,X)
MMR-28(A)
MMR-29(R)
MMR-5(A,X,R)
MMR-30(A,X)
-32(P,R)
MMR-11(R)
MMR-09(R)
MMR-10(X,R)
MMR-13(I,R)
MMR-12(R)
NR-18(R)
NR-19(P)
NR-20(R)
MMR-25(R)
MKR-09(R)
MMR-24(R)
MMR-19(P,X,R)
MMR-22(T)
MMR-01(T,O)
1:5,000
0 100 200 300 400 500m



LEGEND

Rock Sample ● MMR-01(A,P,T,X,I,F,R)

A : Ore Analysis

P : Polished Section

T : Thin Section

X : X-ray Diffraction Test

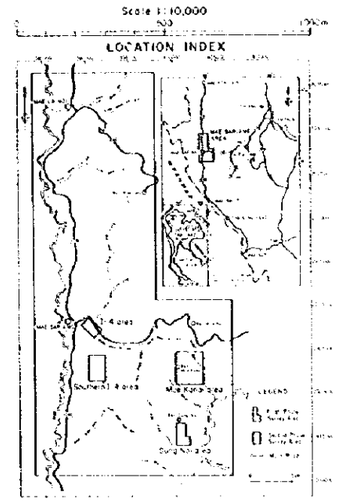
I : Stable Isotope Analysis (δC, δO)

F : Fluid Inclusion Test

R : Resistivity and Chargeability Test

MINERAL EXPLORATION OF MAE SARIANG
OF

Geologic map and profile in I-4 and Southern I-4 area



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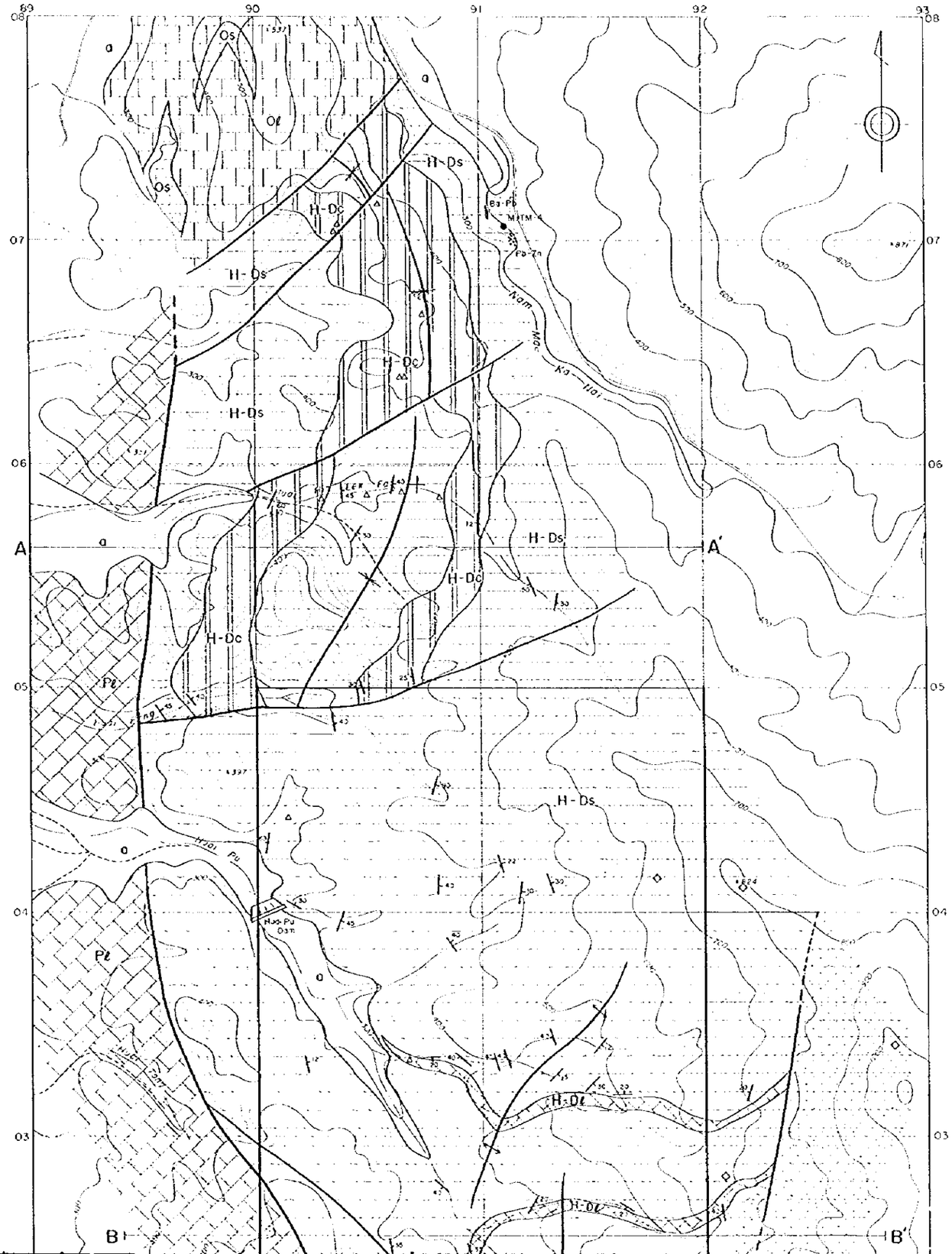
MARCH 1999



LEGEND

1. Sedimentary rocks

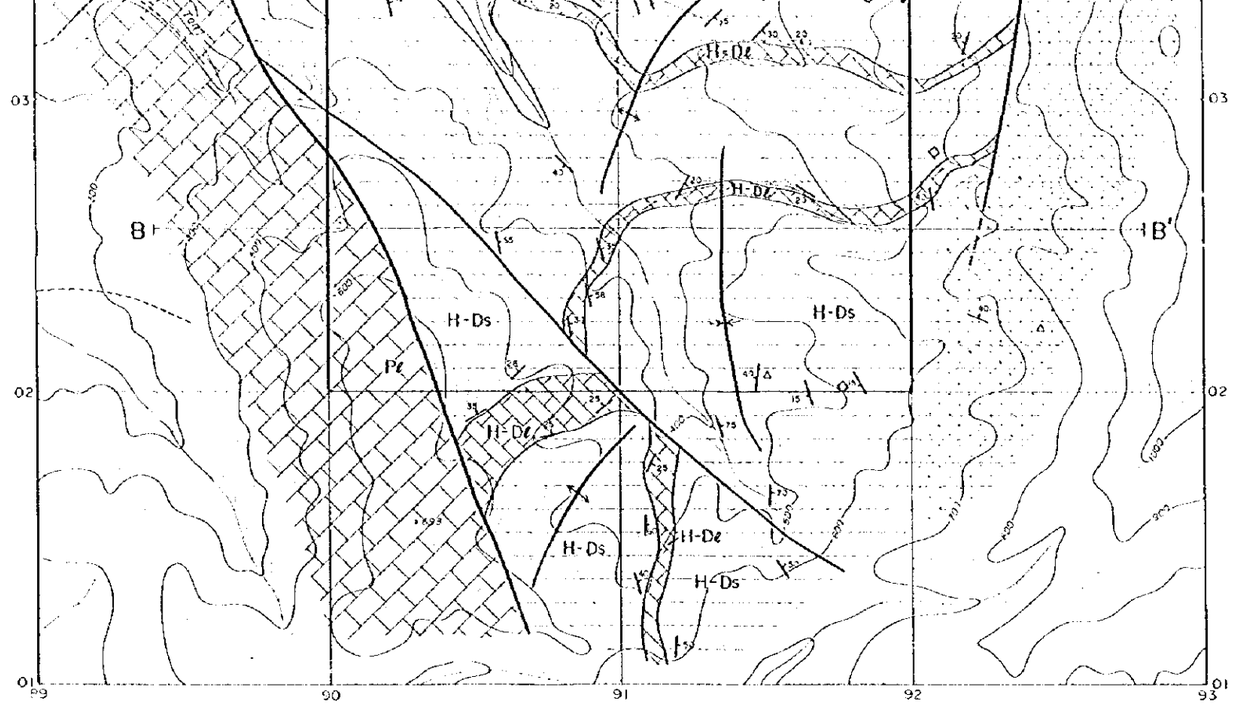
Quaternary	a	alluvium
Permian	Pℓ	limestone
Carboniferous – Devonian	H-Ds	shale, sandstone
	H-Dc	chert
	H-Dℓ	limestone/chert alternation
Ordovician	Oℓ	limestone
	Os	shale, sandstone

2. Geologic symbols

- Fault
- Fault (inferred)
- Syncline
- Anticline
- Strike and dip
- Hornfels
- MAESARIANG-4 Drill hole
- A — A' Profile line

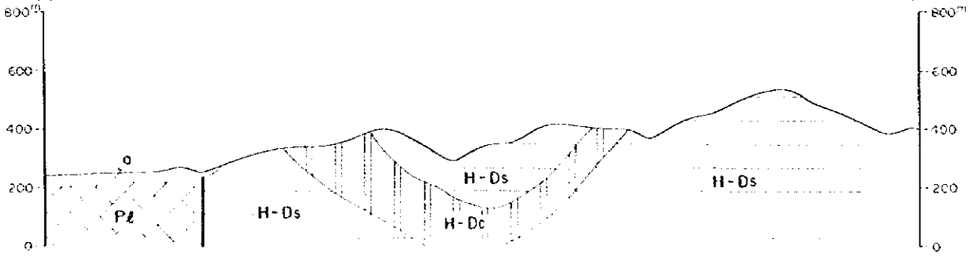
3. Mineral occurrence

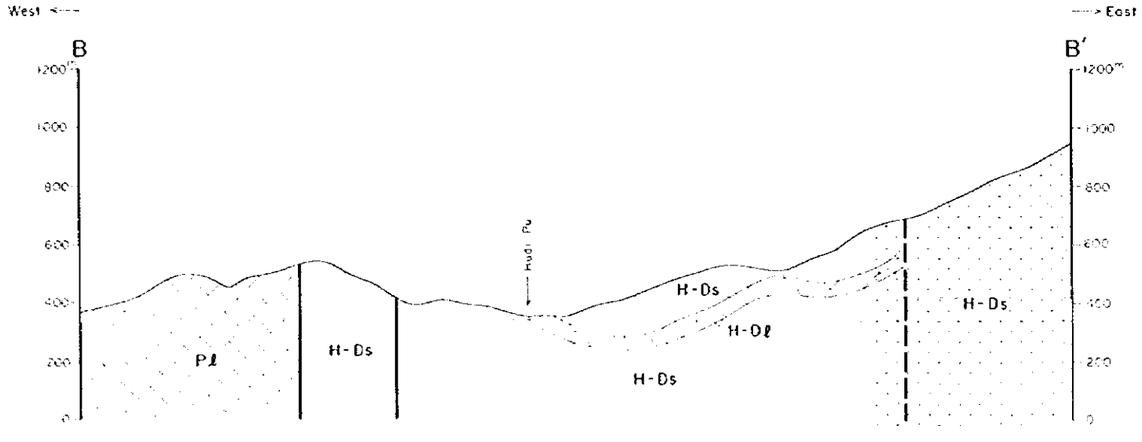
- Pb-Zn galena-sphalerite outcrop
- Ba galena float
- quartz veinlets



3. Mineral occurrence

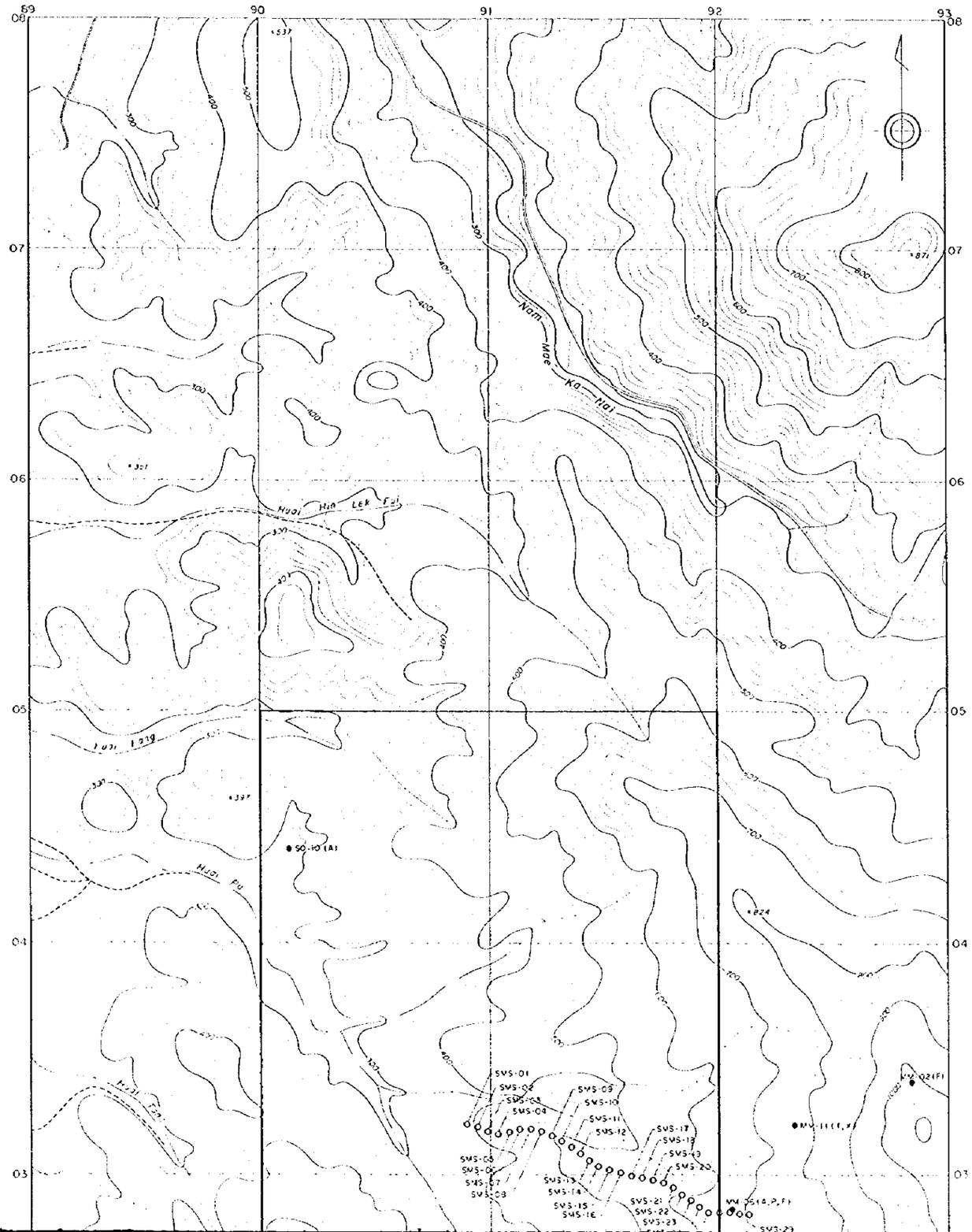
- Pb-Zn — galena-sphalerite outcrop
- △ — barite±galena float
- ◇ — quartz veinlets





1 : 10,000

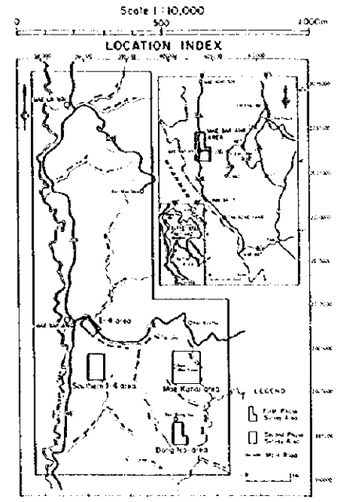
0 500 1000m



PL-6

MINERAL EXPLORATION OF MAE SARIANG
OF

Locality map of Rock samples in I-4 and Southern I-4 area



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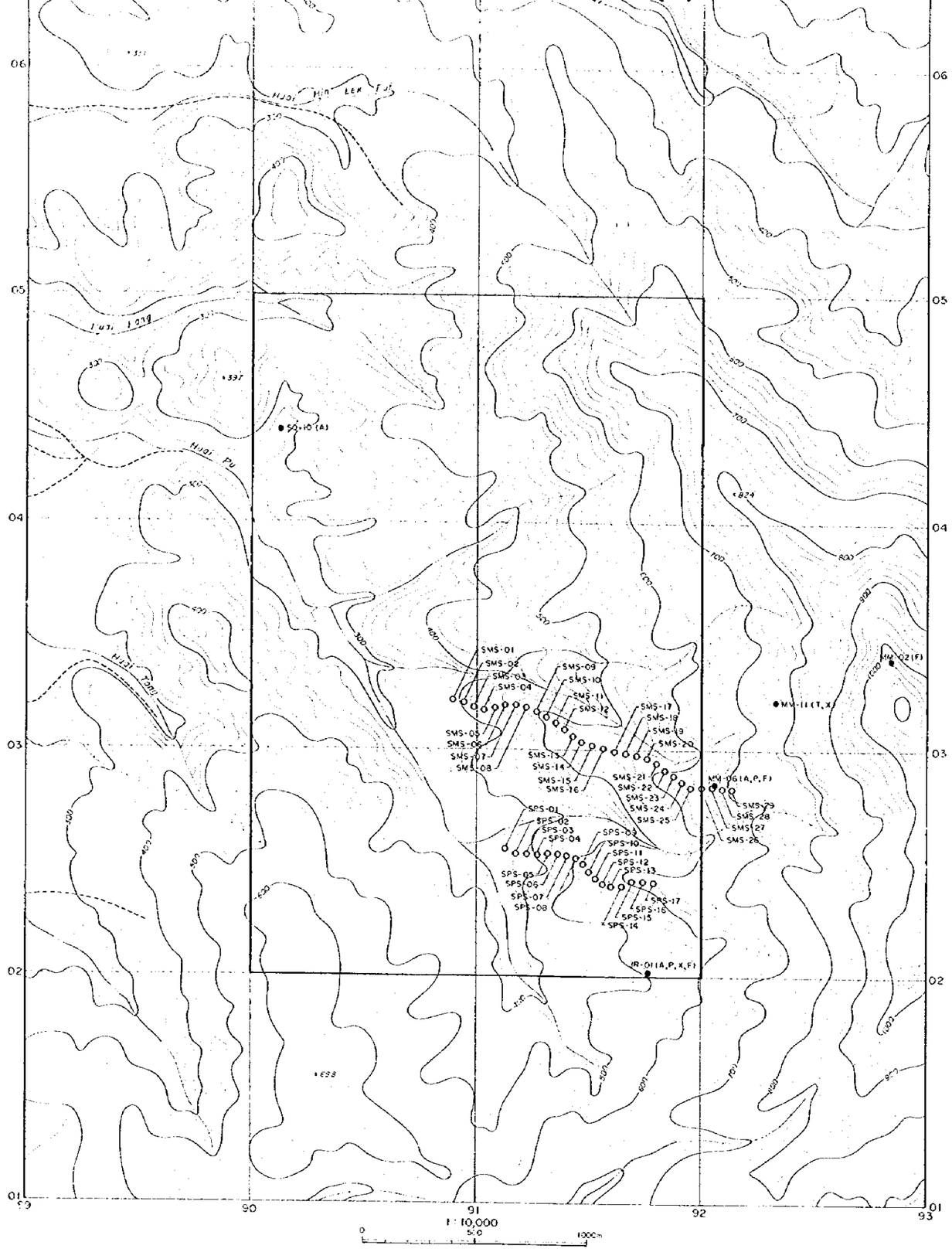
MARCH 1999

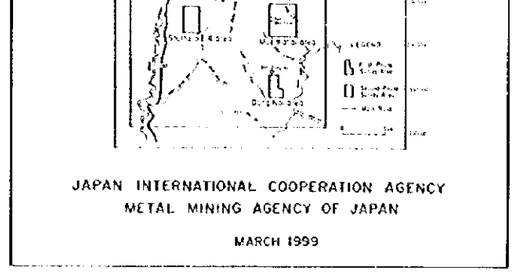
LEGEND

Rock Sample ● JR-01 (A, P, T, X, I, F, R)

A : Ore Analysis
P : Polished Section
T : Thin Section
X : X-ray Diffraction Test
I : Stable Isotope Analysis (δC, δO)
F : Fluid Inclusion Test
R : Resistivity and Chargeability Test

Soil Sample ○ SMS-01





LEGEND

Rock Sample ● JR-01 (A, P, T, X, I, F, R)

- A : Ore Analysis
- P : Polished Section
- T : Thin Section
- X : X-ray Diffraction Test
- I : Stable Isotope Analysis (δC, δO)
- F : Fluid Inclusion Test
- R : Resistivity and Chargeability Test

Soil Sample ○ SMS-01