マレイシア

テカイ河水力発電開発計画調査

報 告 書

第IV巻 地質図面集

1983年 9月

国際協力事業団

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はしがき

日本国政府は、マレイシア国政府の要請に基づき、同国パハン州において早急に開発することが望まれているテンブリン川支流テカイ川の水力発電開発計画のフィージビリティ調査を行うこととなり、その実施を国際協力事業団に委託した。事業団はこの水力発電計画の重要性を考慮し、1981年3月1日から1982年12月15日まで、高比良敬一氏を団長とする各分野の専門家から成る調査団をマレイシアに派遣し、同国政府関係機関の協力を得て現地調査を実施した。

本報告書は、現地調査及び収集した資料に基づき、帰国後調査検討を行い、その成果を取りまとめたものである。本報告書が、マレイシアの電源開発に寄与するとともに、同国と日本との経済交流及び友好親善の一助となれば誠に喜ばしい次第である。

終わりに、今回の調査の実施に当たられた団員各位に謝意を表するとともに、熱意ある支援と協力を賜いたマレイシア国政府関係機関の方々、ならびに外務省、通商産業省及び在マレイシア日本国大使館の関係者各位に対し、この機会に心より感謝の意を表わすものである。

1983年8月

国際協力事業団

総裁　有田圭輔

LIST OF APPENDICES

4. GEOLOGY OF THE UPPER SITE

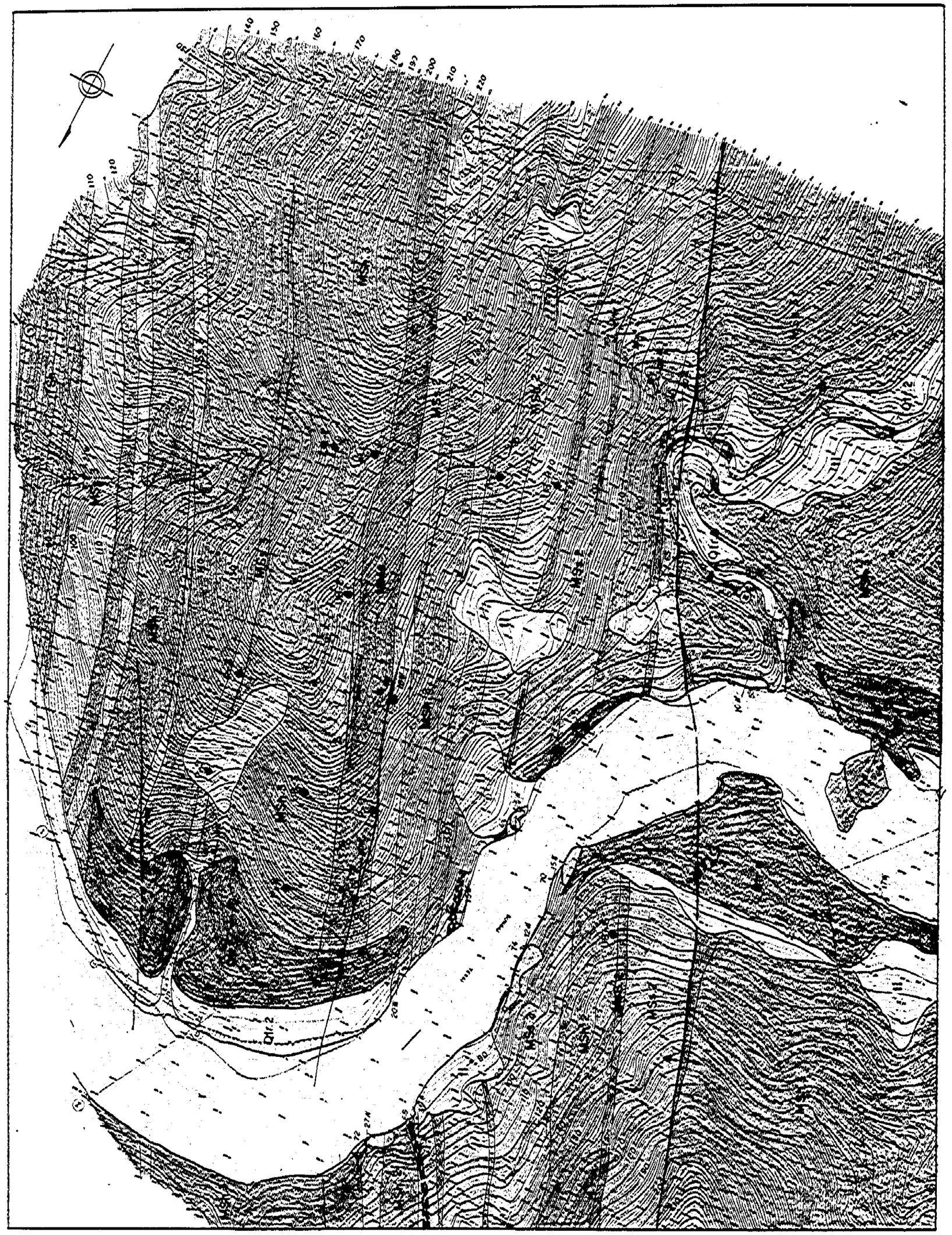
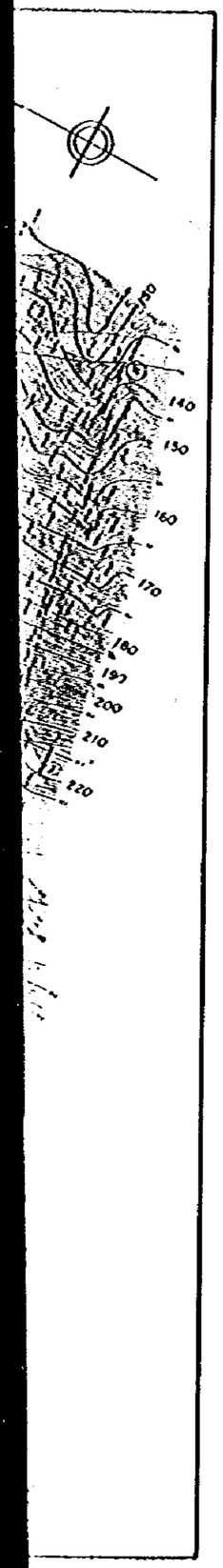


Fig. 4.1 LITHOLOGIC MAP OF UPPER TEKAI BORROW AREA (SITE.A)



LEGEND

GEOLOGICAL AGE		COLOR	SYMBOL	FORMATION	LITHOLOGY
CENOZOIC	QUATERNARY		r	River Bed Deposits	Mainly quartz sand including gravel and silt.
			ll	Talus Deposits	Mainly breccia including sand and clay.
			Qtr.2	Terrace Deposits	Mainly quartz sand including gravel and silt containig organic material.
			Qtr.1		Mainly clayey sand and silt including gravel.
MESOZOIC	LOWER CRETACEOUS		TSh	Termus Redbeds	Reddish/Purplish-red shale interbedded with mudstone.
			TSs		Fine quartzose sandstone.
	UPPER JURASSIC		MSh.3	Mongking Sandstone	Purplish shale and Purplish red shale interbedded with greyish shale and yellow ocher mudstone.
			MSs.3		Mainly quartzose sandstone and sandstone interbedded with shale.
			MMs		Mainly yellow octer mudstone. interbedded with light grey shale or siltstone.
			MSh.2		Mainly greyish shale and greenish shale interbedded with siltyshale and mudstone.
			MsS.2		Shaly sandstone and fine sandstone.
			MSs.2		Predominantly quartzose sandstone and sandstone interbedded with shaly sandstone and shale.
			Mfs		Mainly fine sandstone interbedded with shaly sandstone and shale.

Strike and dip of stratum.

Strike and dip of fault.

Landslide concavity.

Fractured zone.

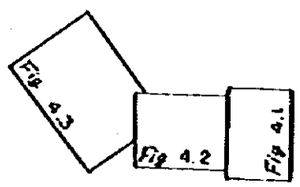
Anticline and folding fault.

UB-1~UB-6 Borehole point and borehole No. carried out in 1982.

P-1 ~ P-9 Test pitting point and pit No. carried out in 1982.

SCALE 1 : 2,500

0 50 100m




MSs 2
MSs
Il
Qtr-2
UD-9
UD-1
UD-6
UD-2
UD-10
UD-11
MSs 2
Qtr-1

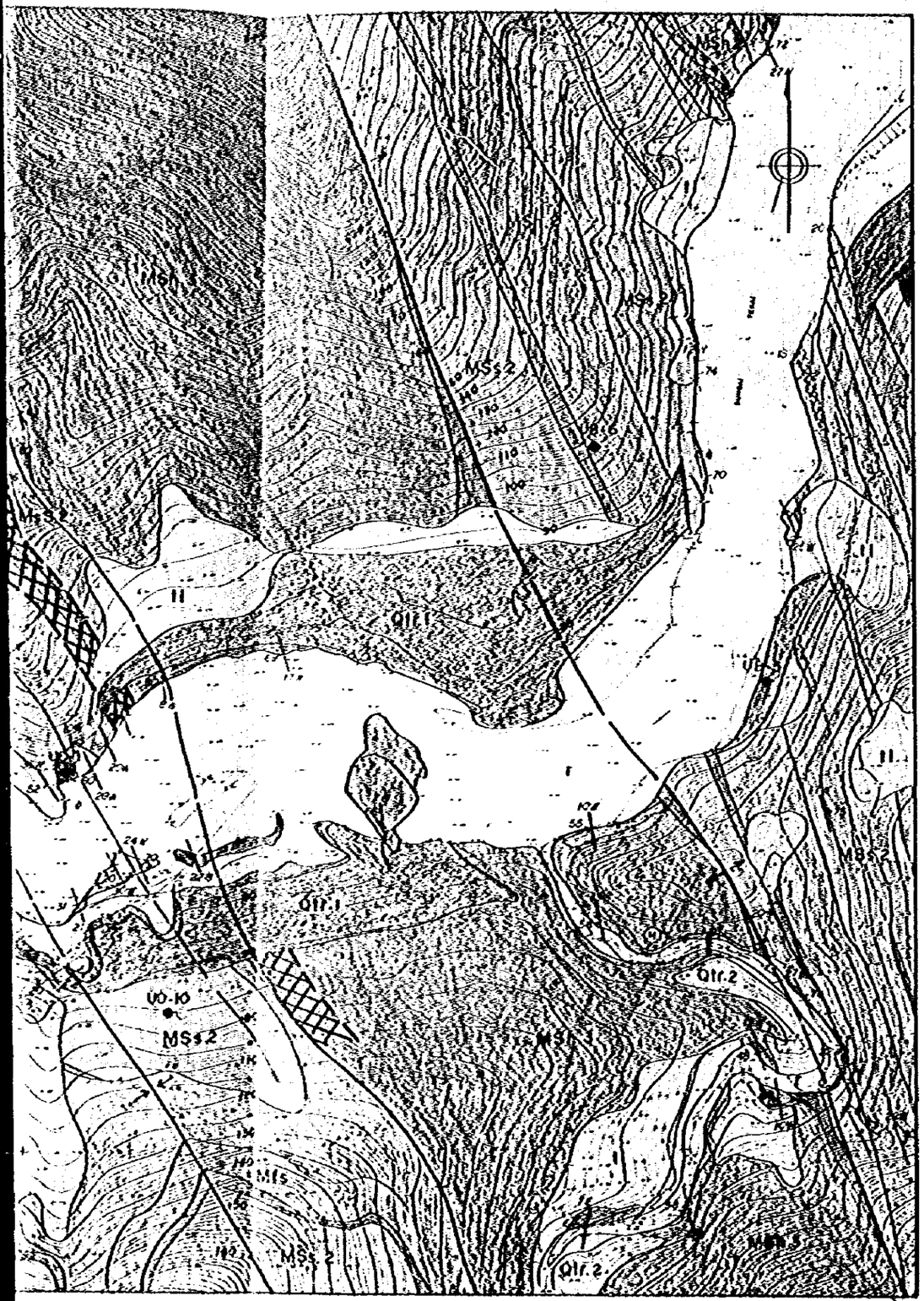


Fig. 4.2 LITHOLOGIC MAP OF UPPER TEKAI DAM SITE

LEGEND

GEOLOGICAL AGE		COLOR	SYMBOL	FORMATION	LITHOLOGY
CENOZOIC	QUATERNARY		r	River Bed Deposits	Mainly quartz sand including silt and
			tl	Talus Deposits	Mainly breccia including sand and c
			Qtr.	Terrace Deposits	Mainly fine sand. including silt and g containing organic material.
			Qtr. 1		Mainly gravel and sand containing organic material.
MESOZOIC	UPPER JURASSIC		MSh.3	Mongking Sandstone	Purplish shale interbedded with grey and yellow ocher mudstone.
			MMs		Mainly yellow ocher mudstone interbedded with greyish shale.
			MSh.2		Mainly greyish shale interbedded with silty shale and m
			MsS.2		Shaly sandstone.
			MfS		Mainly fine sandstone interbedded with shaly sandstone c
			MSs.2		Predominantly quartzose sandstone and interbedded with shale, silty shale an
			MsS.1		Shaly sandstone interbedded with s
			MSh.1		Dark grey shale.
			Ma I.1		Alternation of sandstone and shale
			MSs.1		Predominantly quartzose sandstone an interbedded with shale

Strike and dip of stratum.

Anticline (⟶ plunging)

Syncling.

Fault.

Fractured zone.

Landslide concavity.

UD-1 ~ UD-18 Borehole point and bareh

U-1 ~ U-5 Borehole point and bareh

SCALE 1 : 2,500

0 50 100m

Fig. 4.2 LITHOLOGIC MAP OF UPPER TEKAI DAM SITE

LEGEND

GEOLOGICAL AGE		COLOR	SYMBOL	FORMATION	LITHOLOGY
CENOZOIC	QUATERNARY		r	River Bed Deposits	Mainly quartz sand including silt and gravel.
			tl	Talus Deposits	Mainly breccia including sand and clay.
			Qtr.	Terrace Deposits	Mainly fine sand. including silt and gravel containing organic material.
			Qtr. 1		Mainly gravel and sand containing organic material.
MESOZOIC	UPPER JURASSIC		MSh.3	Mangking Sandstone	Purplish shale interbedded with greyish shale and yellow ocher mudstone.
			MMs		Mainly yellow ocher mudstone interbedded with greyish shale.
			MSh.2		Mainly greyish shale interbedded with silty shale and mudstone.
			MsS.2		Shaly sandstone.
			MfS		Mainly fine sandstone interbedded with shaly sandstone and shale.
			MSs.2		Predominantly quartzose sandstone and sandstone interbedded with shale, silty shale and conglomerate
			MsS.1		Shaly sandstone interbedded with shale.
			MSh.1		Dark grey shale.
			Ma1.1		Alternation of sandstone and shale.
			MSs.1		Predominantly quartzose sandstone and sandstone interbedded with shale.

Strike and dip of stratum.

Anticline (→ plunging)

Syncling.

Fault.

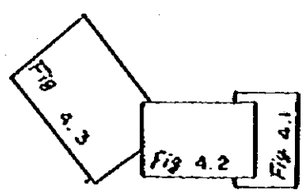
Fractured zone.

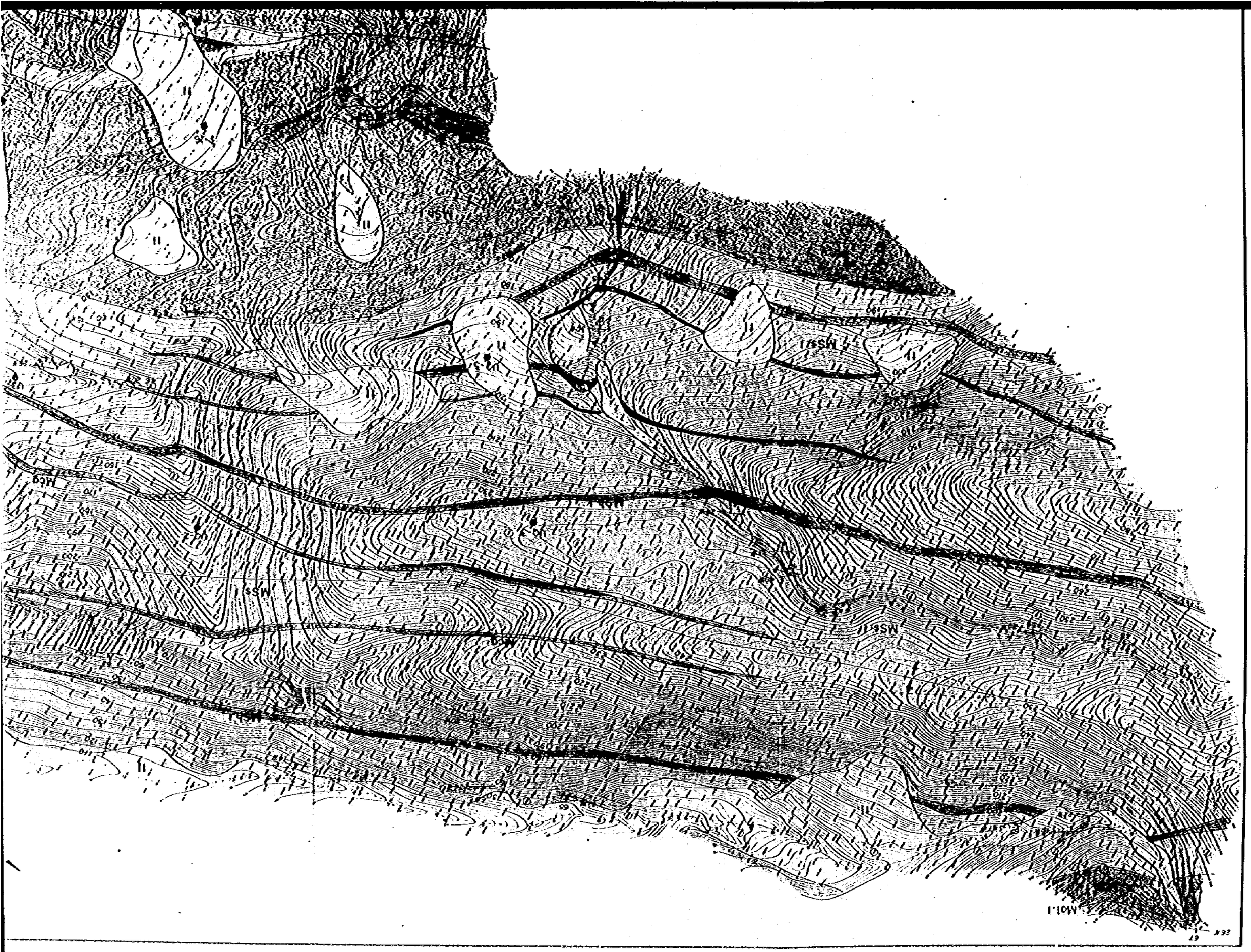
Landslide concavity.

UD-1 ~ UD-18 ● Borehole point and borehole No. carried out in 1982.

U-1 ~ U-5 ■ Borehole point and borehole No. carried out in 1982.

SCALE 1/2,500





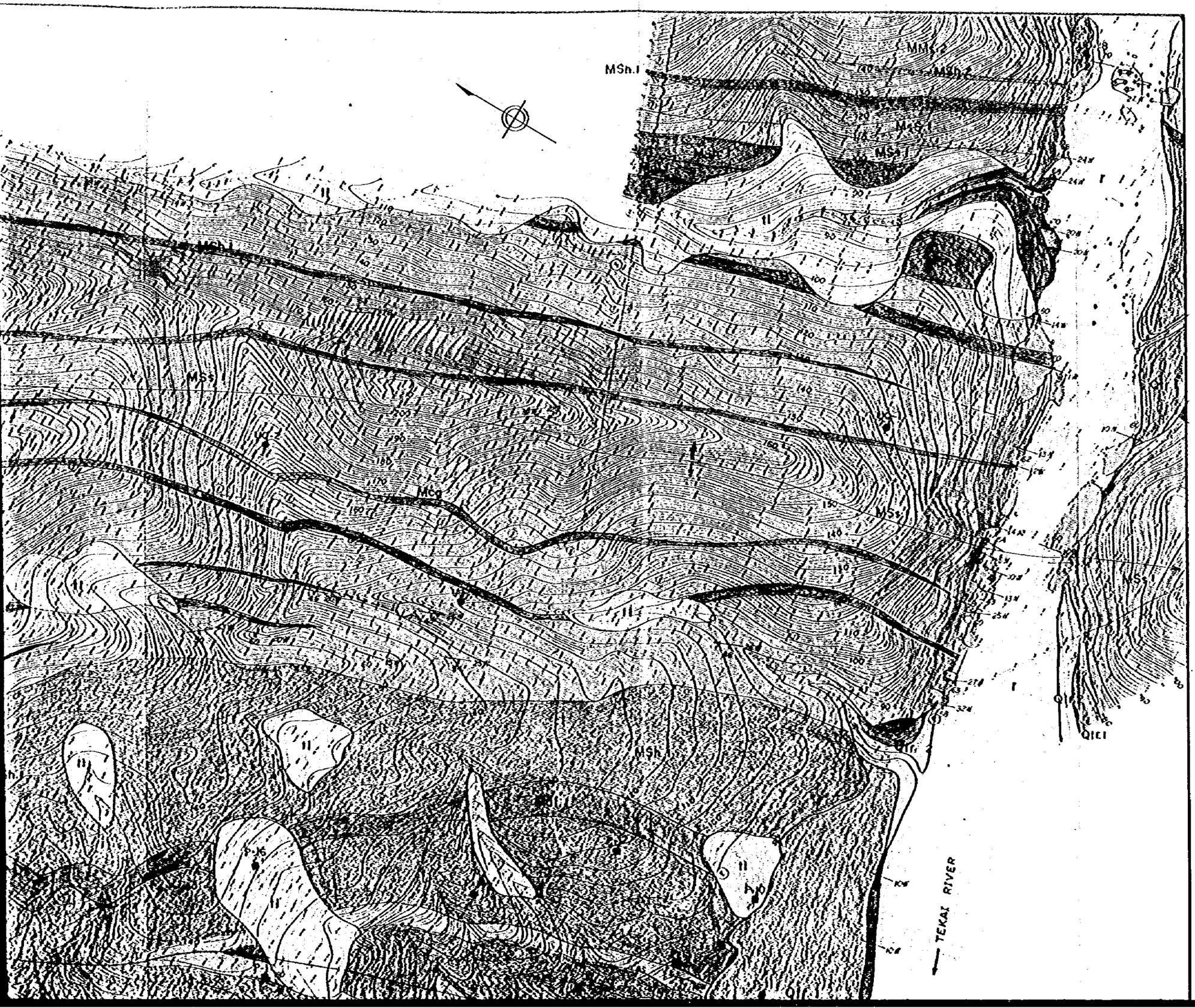


Fig. 4.3 LITHOLOGIC MA

GEOLOGICAL AGE		COLOR	SYM
CENOZOIC	QUATERNARY		r
			tl
			Q1r
			Q1r
MESOZOIC	UPPER JURASSIC		MS
			MS
			Ms
			Mc
			MS
			Mc
			MS

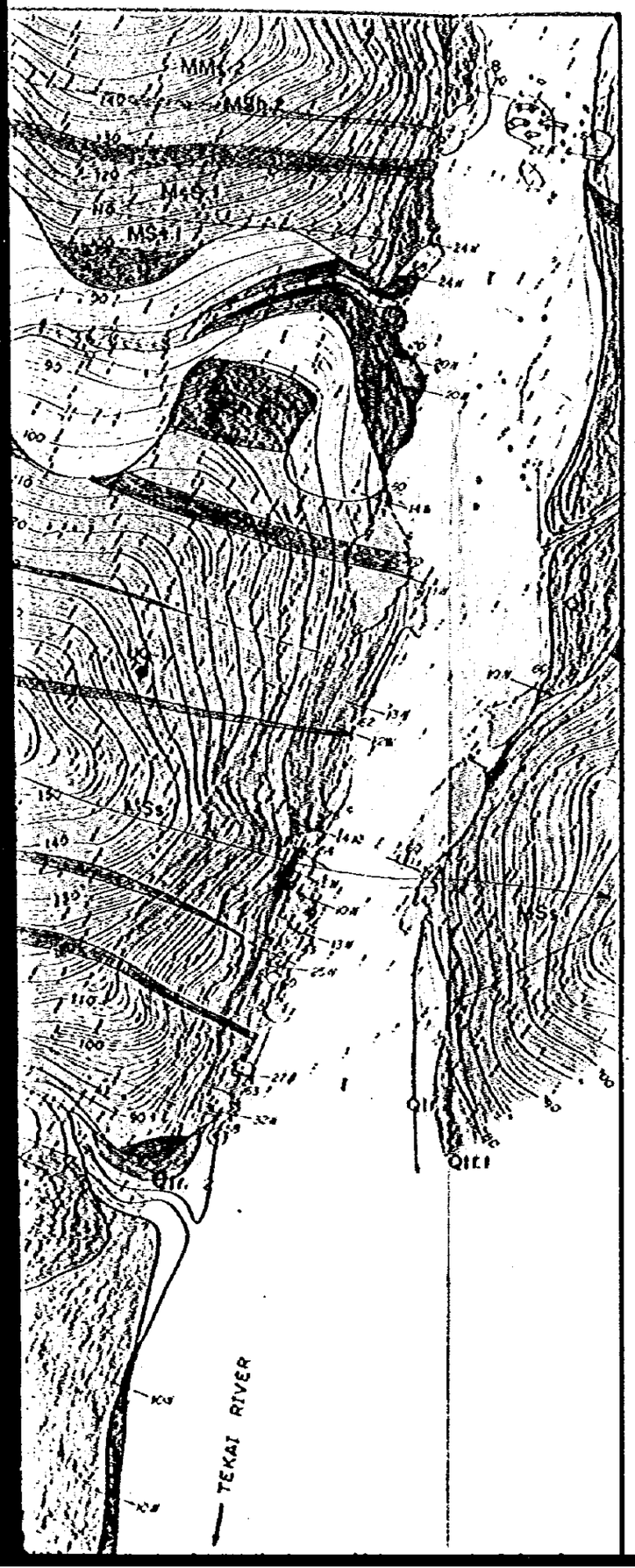


Fig. 4.3 LITHOLOGIC MAP OF UPPER TEKAI QUARRY AND BORROW AREA (SITE. B)

LEGEND

GEOLOGICAL AGE		COLOR	SYMBL	FORMATION	LITHOLOGY
CENOZOIC	QUATERNARY		r	River Bed Deposits	Mainly quartz sand including silt and gravel.
			tl	Talus Deposits	Mainly breccia including clay and silty sand.
			Qtr. 2	Terrace Deposits	Mainly fine sand and clayey sand containing organic material.
			Qtr. 1		Sand and clayey sand with basal gravel.
MESOZOIC	UPPER JURASSIC		MSh.2	Mangking Sandstone	Greyish shale.
			MSs.2		Predominantly quartzose sandstone and sandstone. Interbedded with shale.
			MsS.1		Shaly sandstone interbedded with shale.
			Mal.1		Alternation of sandstone and shale.
			MSh.1		Dark grey shale interbedded with sandstone.
			Mcg		Conglomerate and coarse quartzose sandstone
			MSs.1		Predominantly quartzose sandstone and sandstone interbedded with conglomerate and shale.

Strike and dip of stratum

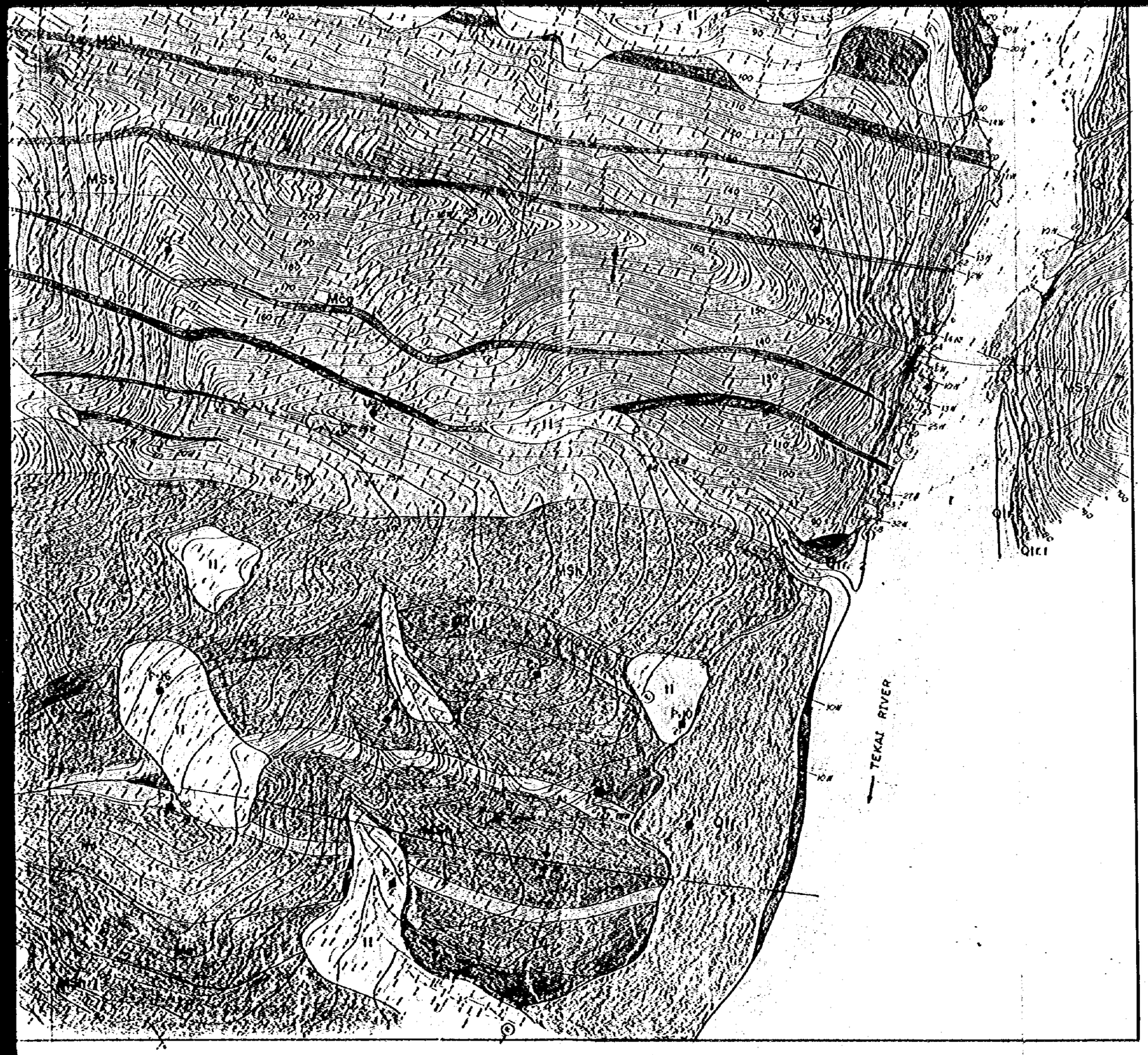
Anticline (⟶ plunging)

Syncline

Landslide concavity

LQ-1~LQ-5 Borehole point and borehole No. carried out in 1982


MQbl
MCg
MSs1
MSs
VO-3
VO-2
MQbk
MCg
MSs1
MSh
110
120
130
140
150
160
170
180
190
200
210
220
230
240



LEGE

GEOLOGICAL AGE		COLOR	SYMBL	FORMATION
CENOZOIC	QUATERNARY		r	River Bed Deposit
			ll	Talus Depos
			Qlr. 2	Terrace Deposit
			Qlr. 1	
MESOZOIC	UPPER JURASSIC		MSh.2	Mangking Sandstone
			MSs.2	
			MsS.1	
			Mal.1	
			MSh.1	
			Mcg	
			MSs.1	

Strike and

Anticline

Syncline

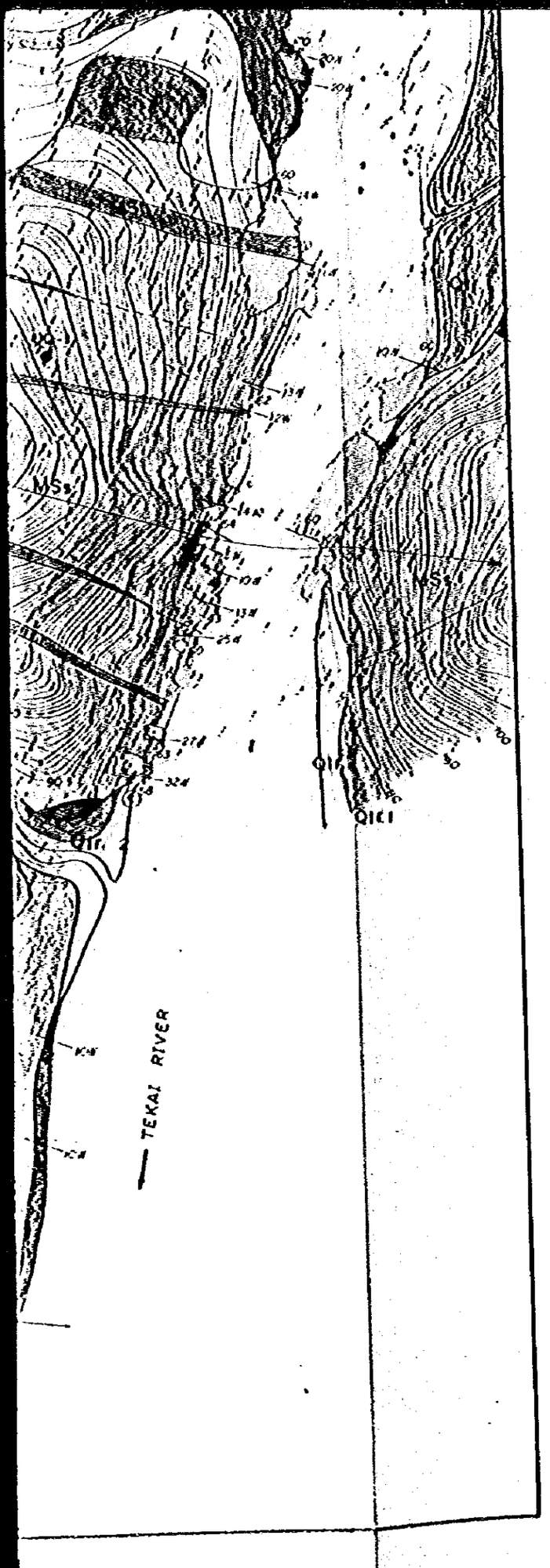
Landslide

LQ-1 ~ LQ-5 UD-13 Borehole p

P-10 ~ P-17 Test pittin

SCALE 1 : 2,500

0 50 100m



LEGEND

GEOLOGICAL AGE		COLOR	SYMBL	FORMATION	LITHOLOGY
CENOZOIC	QUATERNARY		r	River Bed Deposits	Mainly quartz sand including silt and gravel.
			tl	Talus Deposits	Mainly breccia including clay and silty sand.
			Qlr. 2	Terrace Deposits	Mainly fine sand and clayey sand containing organic material.
			Qlr. 1		Sand and clayey sand with basal gravel.
MESOZOIC	UPPER JURASSIC		MSh.2	Mangking Sandstone	Greyish shale.
			MSs.2		Predominantly quartzose sandstone and sandstone. interbedded with shale.
			MsS.1		Shaly sandstone interbedded with shale.
			Mal.1		Alternation of sandstone and shale.
			MSh.1		Dark grey shale interbedded with sandstone.
			Mcg		Conglomerate and coarse quartzose sandstone
			MSs.1		Predominantly quartzose sandstone and sandstone interbedded with conglomerate and shale.

Strike and dip of stratum

Anticline (——→plunging)

Syncline

Landslide concavity

LQ-1~LQ-5 UC-18 Borehole point and borehole No.carried out in 1982

P-10 ~ P-17 Test pitting point and pit No.carried out in 1982

SCALE 1 : 2,500

0 50 100m