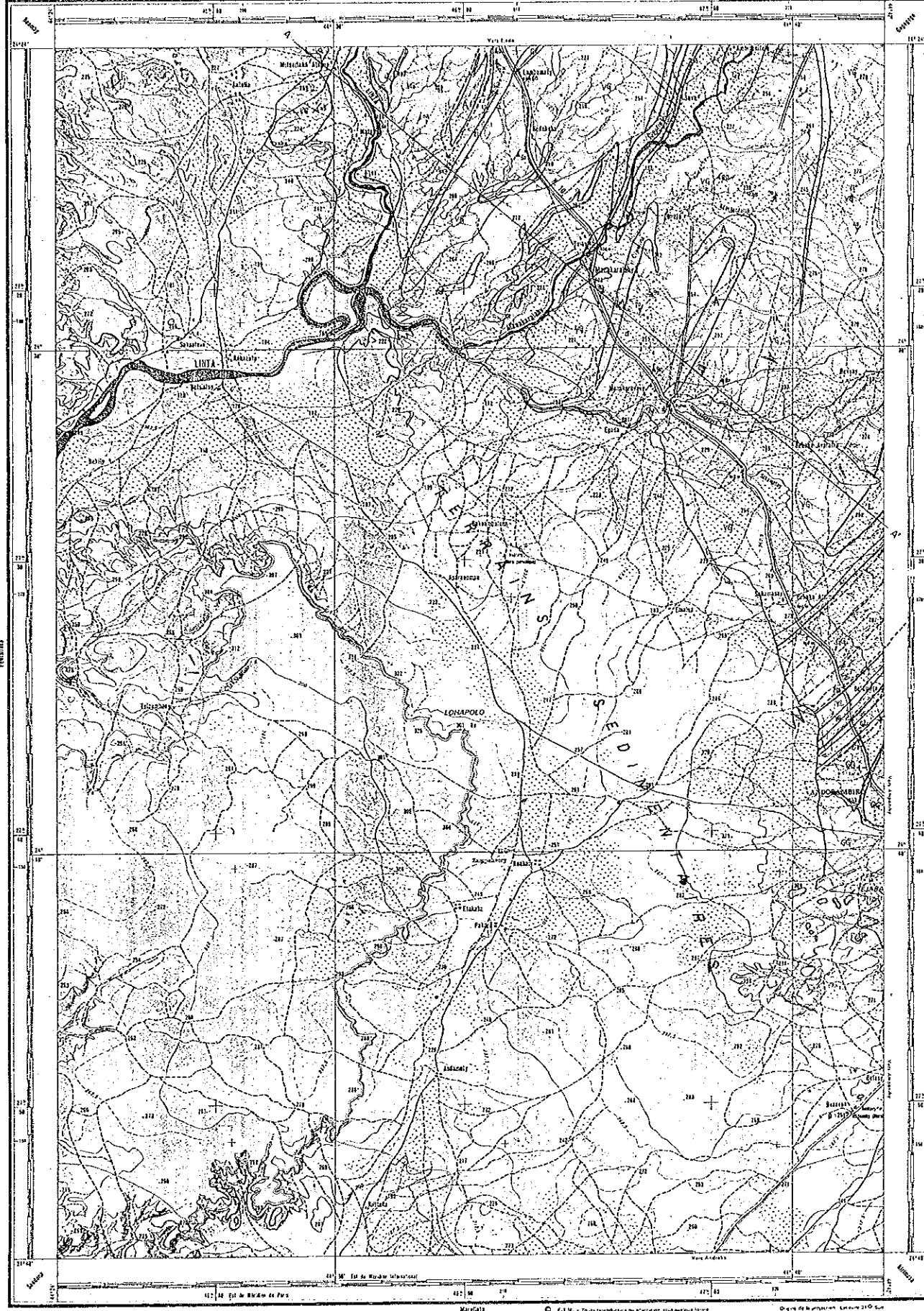


FEUILLE F-61
CARTE TOPOGRAPHIQUE AU 1:100 000

MANAKARALAHY

Mise à jour des limites administratives en 1992

PROVINCE DE TULÉAR
RÉGION DE TULÉAR
S. P. MANAKARALAHY
1 - C. ALGÈRE
2 - C. ALGERIE
3 - C. ALGERIE
4 - C. ALGERIE
5 - C. ALGERIE



Scale 1:100,000
Echelle 1:100,000

PL. 3-1-1

THE MINERAL EXPLORATION
IN
THE SOUTHERN AREA
THE DEMOCRATIC REPUBLIC OF MADAGASCAR
(PHASE I)
GEOLOGICAL MAP AND PROFILE
OF THE MANAKARALAHY DISTRICT (1)

1-61 Manakarahy
1-62 Ampangaha
1-63 Franckoa
1-64 Bekato
1-65 Ambohibo
1-66 Mahaly
1-67 Extra
1-68 Tranomaro
1-69 Antranomaro
2-61 Basamakajana du Sud
1-67 Sainte Lucie
1-67 Fort Dauphin (Ilfanana)

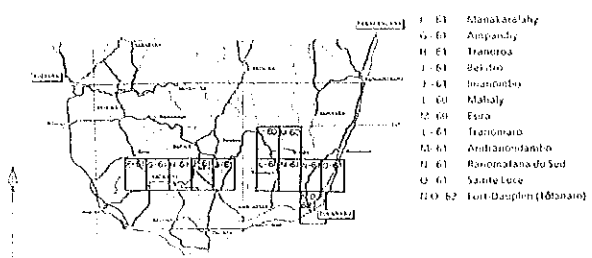
JAPAN INTERNATIONAL COOPERATION AGENCY
METAL MINING AGENCY OF JAPAN
FEBRUARY 1992

Scale 1:100,000

LEGEND

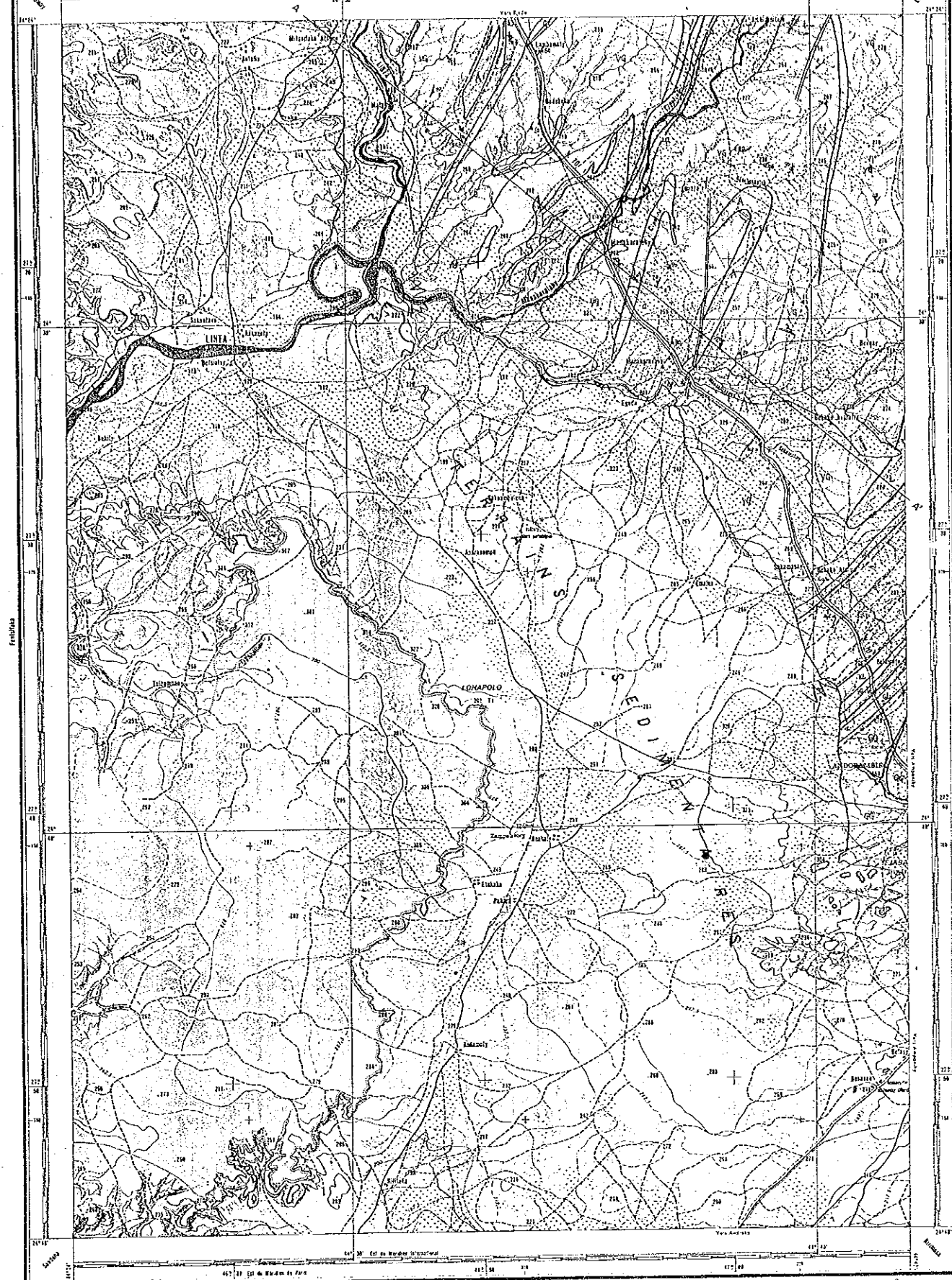
Quaternary	Alluvium				
Neogene	Andranoboseries, Mudstone, sandstone				
Recent igneous rocks	Basalt, dolerite, dike	Rhyolite dike	Microgranite	Microsyenite	
Old igneous rocks	Granite dike	Granite	Gabbro		
	Labradorite	Serpentine	Orthogneiss		
	Augen gneiss	Granite gneiss	Porphyritic granite		
	Concordant granite	Granite complex	Alkali granite		
	Amphibole granite	Stratiform granite, migmatitic granite			
	Pyroxenite	Charnockite	Dunite		
Precambrian Crystalline Schist					
Common facies in different formations	Graphite	Quartzite	Marble	Amphibolite	
Volcanic System (Vohibory Group)	Gneiss	Leptinite			
Graphite System (Ampangaha Group)	Gneiss	Leptinite			
Andriomen System					
Ampangandava Group	Gneiss	Marble Bed, Gneiss, marble			
Isanumaro Group	Lambatra Bed, Leptinite	Ambe Bed, Gneiss, quartzite			
Fank-Daughin Group	Isiamaha Bed, Leptinite	Tranomaro Bed, Gneiss, marble, pyroxenite			
	Assakosmary Bed, Leptinite, quartzite, gneiss, pyroxenite				
	Leptinite, granulite, gneiss	Leptinite	Granitic rock		
Structural					
Dip < 45°	Dip > 45°	Vertical	Horizontal	Anticline	Syncline
Overturned anticline	Overturned syncline	Schistosity	Plunging axis	Visible fault	Presumed fault
Mylonite	Pegmatite	Quartz vein			
Zinc	Tunnel	Open pit			
Phlogopite	Muscovite	Quartz	Rhombohedral	Graphite	Graphite vein
Cu	Iron	Beryl	Tourmaline	Leucite	Althelyst
Chrysolite	Kaolin	Jasper	Apatite	Fluorite	Thorianite
Corundum	Alumina	Sapphire	Shaleite	Tantalite	Magnetite
Bauxite	Calcite	Pyrite	Pyrite, molybdenite		
Zircon	Monazite	Ilmenite	Zircon, Monazite sand		
Limestone	Quartz	Hot spring			

THE DEMOCRATIC REPUBLIC OF MADAGASCAR
 (PHASE 1)
 GEOLOGICAL MAP AND PROFILE
 OF THE MANAKARALAHY DISTRICT (1)



JAPAN INTERNATIONAL COOPERATION AGENCY
 METAL MINING AGENCY OF JAPAN
 FEBRUARY 1992

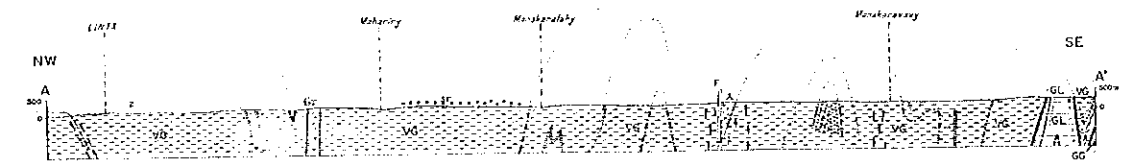
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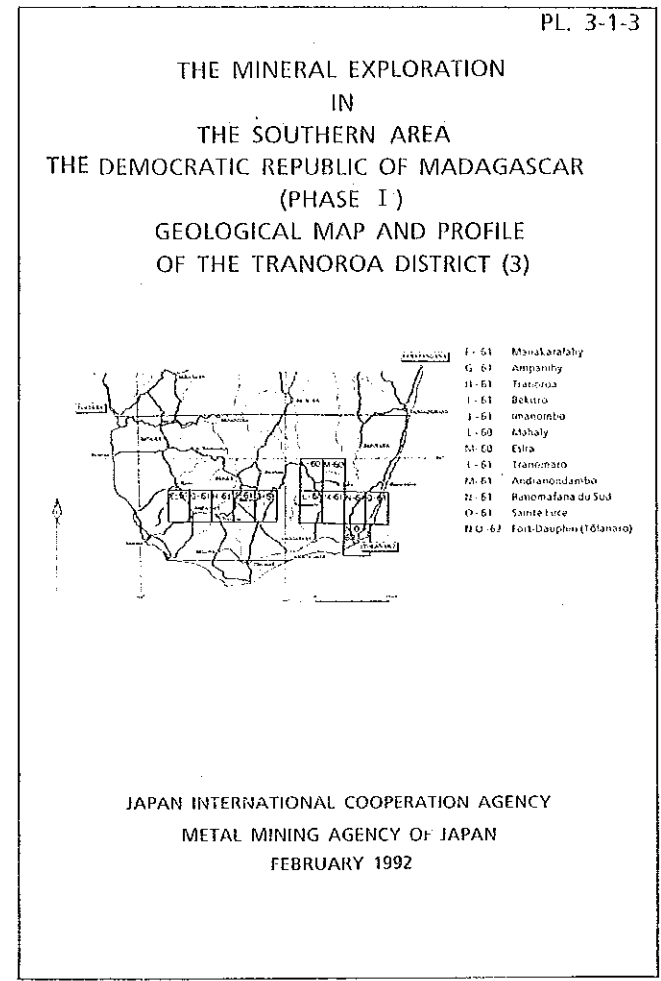
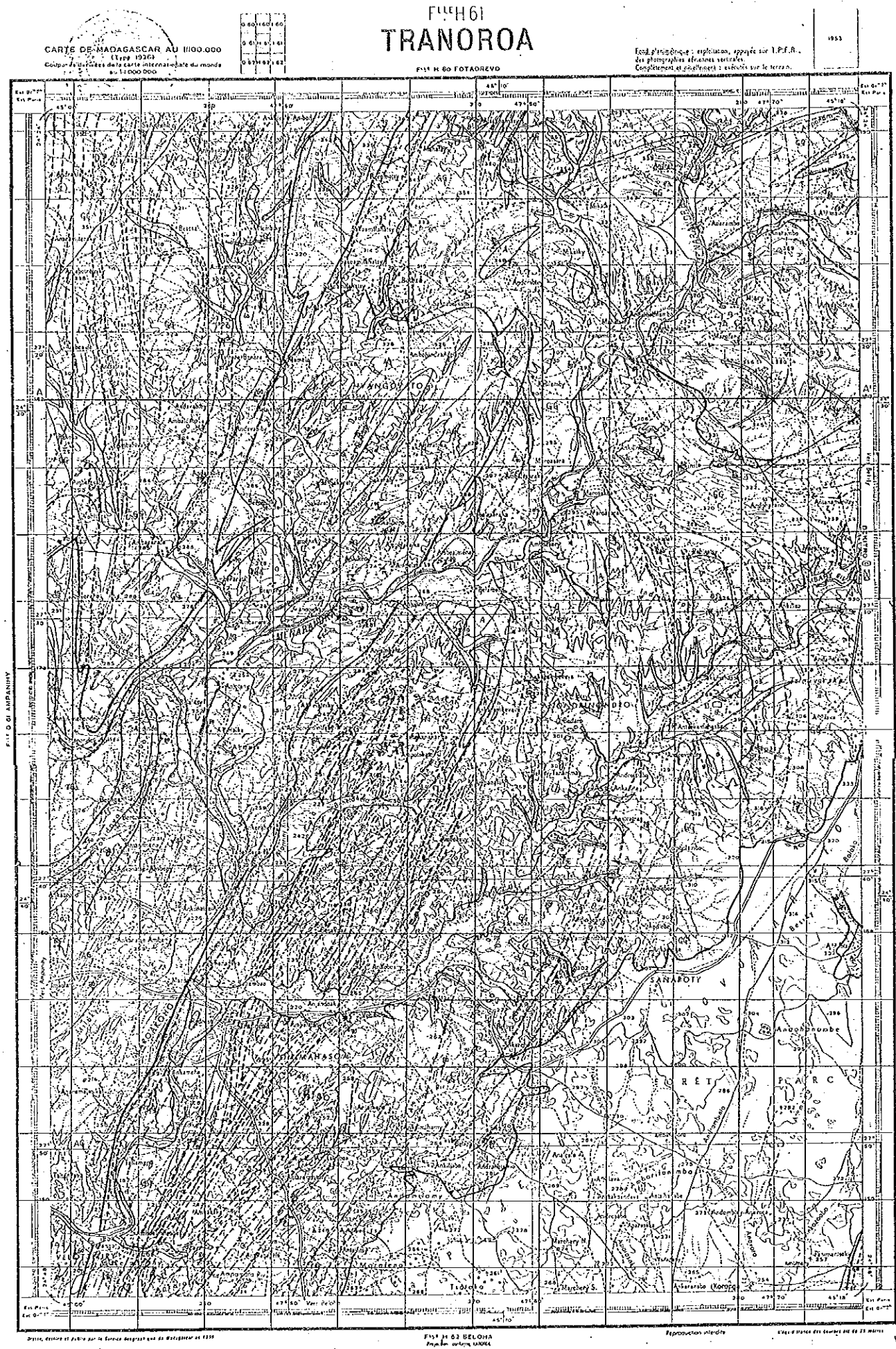


Échelle 1:100 000
 0 1 2 3 4 5 6 7 8 9 10
 Kilomètres

LEGEND

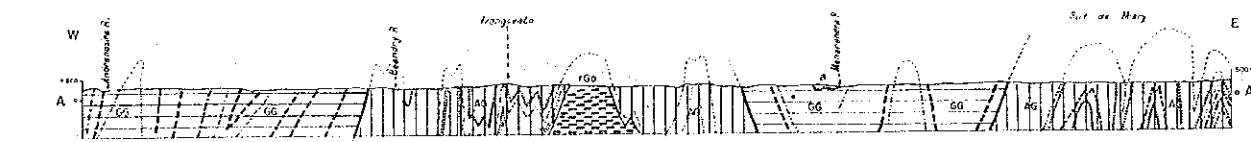
Hydrosphere	Atollum	Andranobato Series; Mudstone, sandstone	Rhyolite dike	Microgranite	Microsyenite
Recent igneous Rocks	Basalt, tholeiite dike	Granite dike	Granite	Gabbro	
Old igneous Rocks	Leucodiorite	Augen gneiss	Concordant granite	Amphibole gneiss	Pyroxenite
Pre-Cambrian Crystalline Schist	Common facies in different formations	Wahlohy System (Wahlohy Group)	Graphite System (Ampanahy Group)	Ampanahy Group	Androyen System
	Graphite	Gneiss	Gneiss	Gneiss	Leptinite
	Quartzite	Leptinite	Leptinite	Leptinite	Leptinite
	Staurolite	Amphibole	Marfely Bed, Gneiss, marble	Amre Bed, Gneiss, quartzite	Tranomamy Bed, Gneiss, marble, pyroxenite
	Amphibole	Leptinite, granulite, gneiss	Leptinite	Granitic rock	
Signs	Dip 45°	Dip > 45°	Vertical	Schistosity	Horizontal
	Overturned anticline	Overturned syncline	Flung gneiss	Visible fault	Presumed fault
	Mylonite	Pegmatite	Quartz vein		
	Mine	Tunnel	Open pit		
	Phlogopite	Muscovite	Quartz	Rose quartz	Graphite vein
	Cu	Zn	Beryl	Tourmaline	Euclase
	Chrysoberyl	Kaplin	Jasper	Apatite	Huonite
	Corundum	Allanite	Sapphire	Sheelite	Tantalite
	Bauxite	Cassiterite	Pyrite	Pyrite, molybdenite	Ilmenite
	Zircon	Monazite	Emerald-Zircon	Monazite sand	
	Limestone	Quarry	Hot spring		





LEGEND

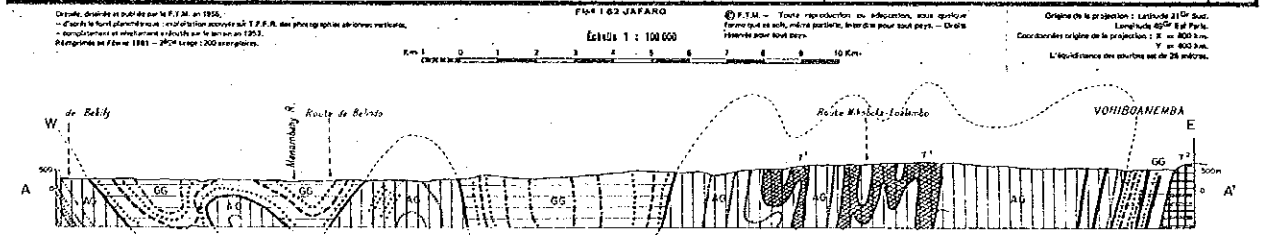
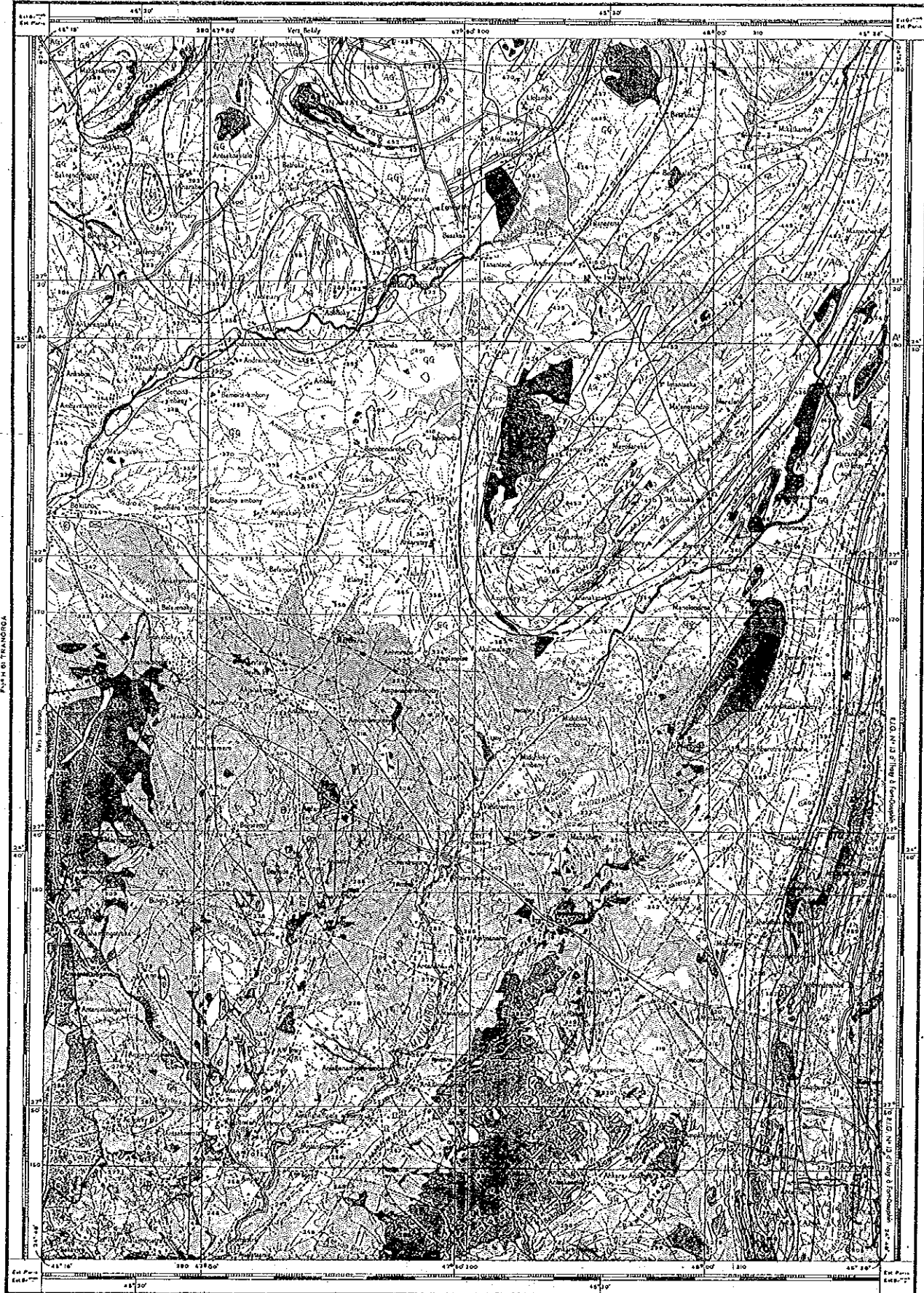
Quaternary	Q	Alluvium	Al					
Cenozoic	mp	Andranosoa Series: Mudstone, sandstone	AN					
Recent igneous rocks	Basalt-tolerite dike	Bt	Rhyolite dike	Rd	Microgranite	MP	Microsyenite	
Older igneous rocks	Granite dike	Gd	Granite	G	Gabbro	Gb		
	Labradorite	L	Serpentine	N	Orthogneiss	O		
	Augsengneiss	GyO	Granitic gneiss	Gy	Porphyritic granite	P		
	Concordant granite	GyC	Granitic complex	G	Alkali granite	Ak		
	Amogones Granite	AG	Stratiform granite, mylonitic granite	SG	Dunite	D		
	Pyroxenite	Px	Charnockite	Ch				
Pre-Cambrian Crystalline Schist								
Common facies in different formations	Graphite	G	Quartzite	Q	Marble	M	Amphibolite	A
Wohlbory System (Wohlbory Group)	Gneiss	VG	Leptinite	VL				
Graphitic System (Ampanany Group)	Gneiss	GG	Leptinite	GL				
Andriaman Group	Ampanandava Group	AG	Gneiss	MG	Mafely Bed, Gneiss, marble			
	Tranomaro Group	LL	Lakatsira Bed, Leptinite	AmG	Ambre Bed, Gneiss, quartzite			
	Antsaka Group	TL	Tsolomaha Bed, Leptinite	TrG	Tranomaro Bed, Gneiss, marble, pyroxenite			
	Fort Dauphin Group	AL	Antsaka Group Bed, Leptinite, quartzite, gneiss, pyroxenite	L	Leptinite, granulate, gneiss	Lgc	Leptinite	Lyg
Signs								
Dip < 45°	Dip > 45°	Vertical	Horizontal	Anticline	Syncline			
Overturned anticline	Overturned syncline	Schistosity	Plunging axis	Visible fault	Presumed fault			
Mylonite	Pegmatite	Quartz vein						
Mine	Tunnel	Open pit						
Phosphorite	Dolomite	Quartz	Rose quartz	Graphite	Graphite vein			
Cu	Mn	Beryl	Tourmaline	Euasite	Amethyst			
Chrysoberyl	Kaolin	Jasper	Apatite	Fluorite	Thorianite			
Corundum	Alumina	Sapphire	Steelite	Tantalite	Magnetite			
Bauxite	Cassiterite	Pyrite	Pyrite, molybdenite		Ilmenite			
Zinc	Mn-oxide	Ilmenite-Zinc-Mn-oxide sand						
Limestone	Quarry	Hot spring						



FEUILLE 161
CARTE TOPOGRAPHIQUE AU 1:100 000

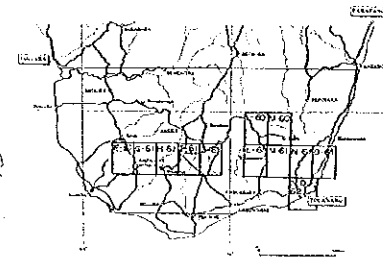
BEKITRO

Produit en République Malgache le 12/12/1988
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100 - FANTANAN'OLY



PL. 3-1-4

THE MINERAL EXPLORATION
IN
THE SOUTHERN AREA
THE DEMOCRATIC REPUBLIC OF MADAGASCAR
(PHASE I)
GEOLOGICAL MAP AND PROFILE
OF THE BEKITRO DISTRICT (4)



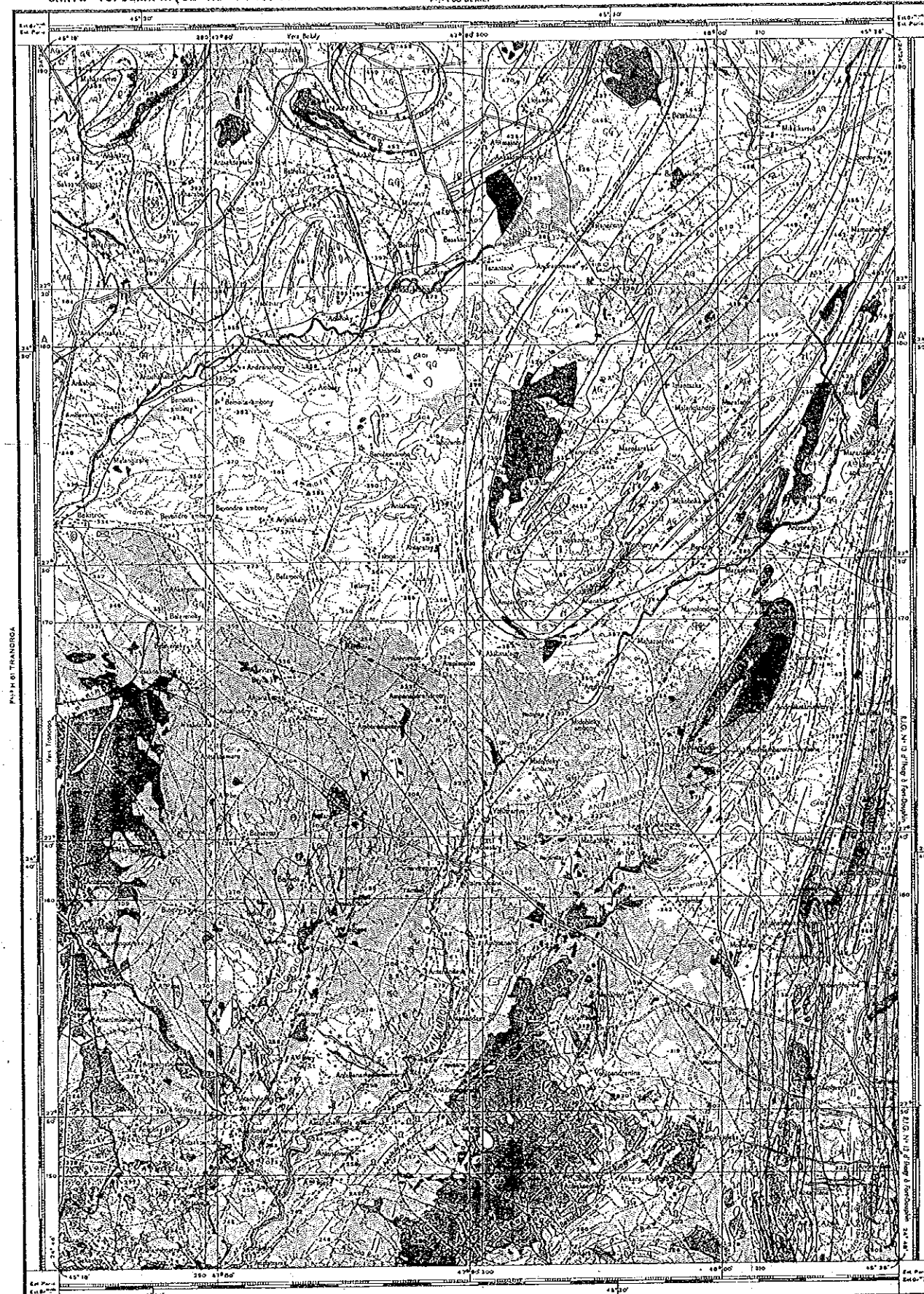
- 7-61 Manakalaby
- 8-61 Anjanfy
- 11-61 Francosa
- 1-61 Bekitro
- 3-61 Inanamiko
- 4-61 Mahaly
- 13-60 Evra
- 1-61 Transmaro
- 21-61 Andranondambo
- 21-61 Raimafana du Sud
- 03-61 Sainte Evre
- 11-62 Fort-Dauphin (Tolanaro)

JAPAN INTERNATIONAL COOPERATION AGENCY
METAL MINING AGENCY OF JAPAN
FEBRUARY 1992

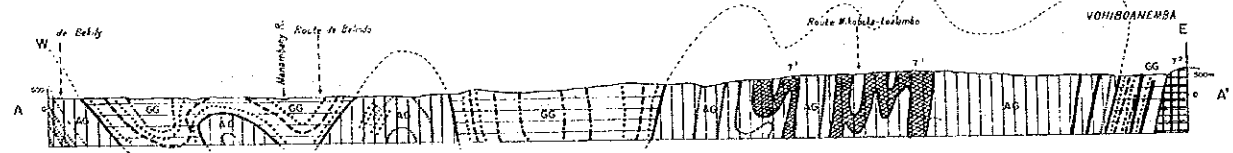
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LEGEND

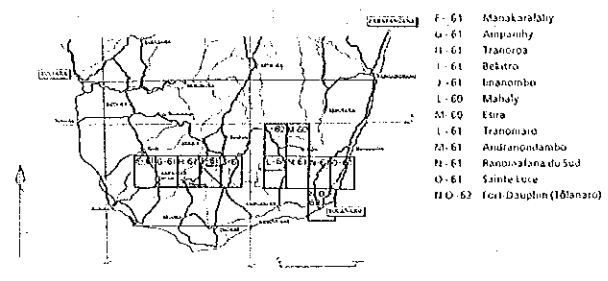
Quaternary	Alluvium	Recent Tertiary Rocks	Rhyolite dike	Microgranite	Microsyenite
Neogene	Andranobato Series: Mudstone, sandstone				
Old Tertiary Rocks	Granite dike	Granite	Gabbro		
	Labradorite	Serpentine	Orthogneiss		
	Augen gneiss	Granite gneiss	Porphyritic granite		
	Concordant granite	Granite complex	Alkali granite		
	Anosyennes Granite	Stratiform granite, migmatite granite			
	Pyroxenite	Charnockite	Dunite		
Precambrian Crustal Fine Schist					
Common facies in different formations	Graphite	Quartzite	Marble	Amphibolite	
Vohibory System (Vohibory Group)	Gneiss	Lepidinite			
Graphite System (Ampandava Group)	Gneiss	Lepidinite			
Androyen System					
Ampandava Group	Gneiss	Maficite Bed: Gneiss, marble			
Transmaro Group	Lantsisitra Bed: Lepidinite	Amb'e Bed: Gneiss, quartzite			
Fort-Dauphin Group	Tsamaha Bed: Lepidinite	Transmaro Bed: Gneiss, marble, pyroxenite			
	Anasakaniary Bed: Lepidinite, quartzite, gneiss, pyroxenite				
	Lepidinite, granulite, gneiss	Lepidinite	Granite rock		
Signs					
Dip < 45°	Dip > 45°	Vertical	Horizontal	Anticline	Syncline
Overturned anticline	Overturned syncline	Schistosity	Plunging axis	Visible fault	Presumed fault
Mylonite	Pegmatite	Quartz vein			
Mine	Tunnel	Open pit			
Phlogopite	Muscovite	Quartz	Rose quartz	Graphite	Graphite vein
Cu	Mn	Beryl	Tourmaline	Euxenite	Amethyst
Chrysothole	Kaolin	Naiper	Apatite	Fluorite	Thorianite
Corundum	Allanite	Sapphire	Sheelite	Tantalite	Magnetite
Bauxite	Cassiterite	Pyrite	Pyrite, molybdenite	Ulf	Ilmenite
Zircon	Monazite	Ilmenite-Zircon-Monazite sand			
Limestone	Quarry	Hot spring			



Échelle 1 : 100 000
 Origine de la projection : Longitude 48° 30' Est, Latitude 23° 00' Sud
 Longueur de la bande 100 km, Largeur de la bande 100 km
 Coordonnées géographiques de la projection : X = 400 km, Y = 400 km
 Le quadrangle des coordonnées est de 25 mètres



THE MINERAL EXPLORATION
 IN
 THE SOUTHERN AREA
 THE DEMOCRATIC REPUBLIC OF MADAGASCAR
 (PHASE I)
 GEOLOGICAL MAP AND PROFILE
 OF THE BEKITRO DISTRICT (4)



JAPAN INTERNATIONAL COOPERATION AGENCY
 METAL MINING AGENCY OF JAPAN
 FEBRUARY 1992

Scale 1:100,000

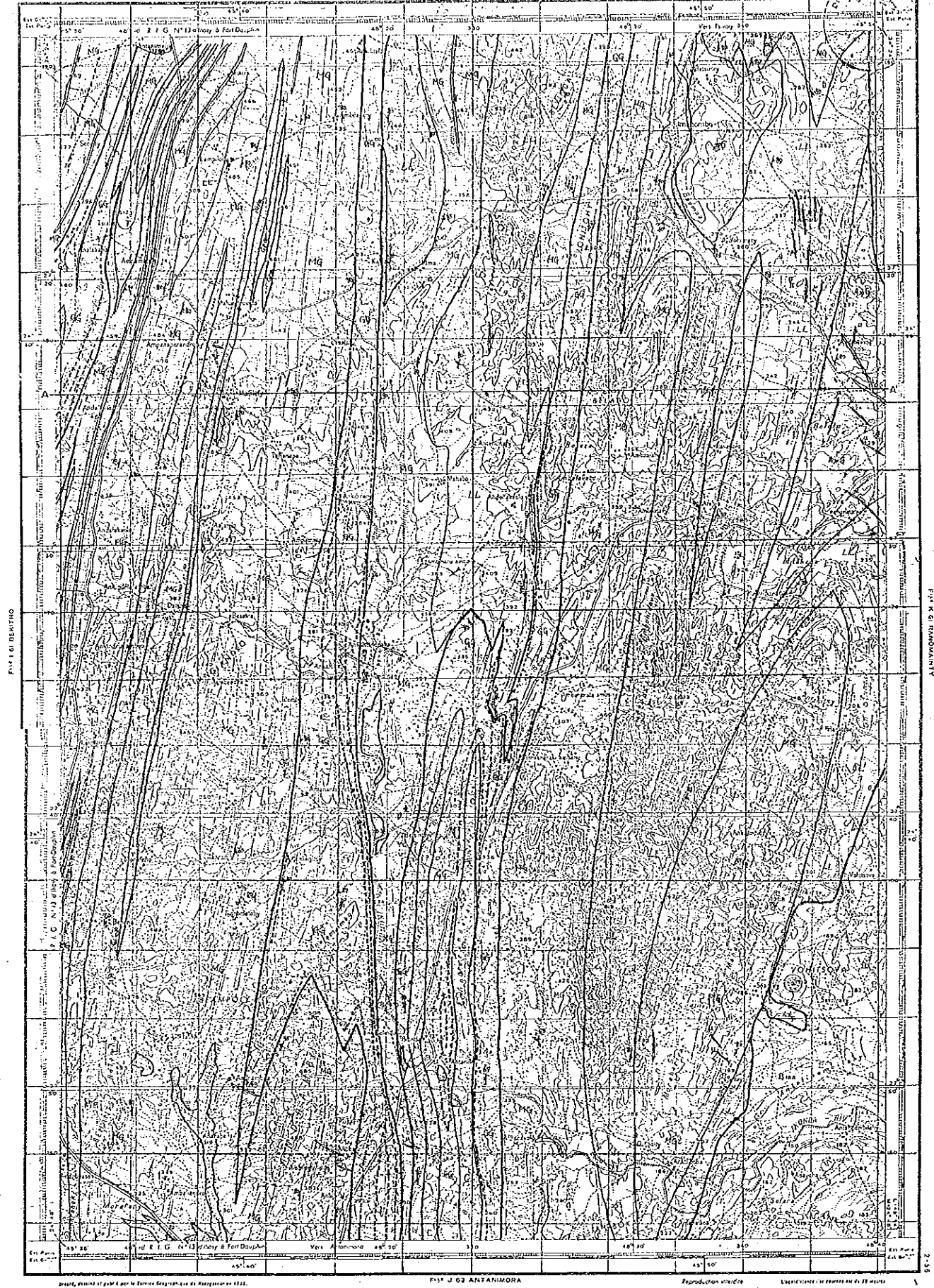
LEGEND

Hydrogen	Blank	Alluvium	Blank	Andranombo Series; Mudstone, sandstone	Blank	Basalt-Dolerite dike	Blank	Rhyolite dike	Blank	Microgranite	Blank	Microsyenite
Recent igneous rocks	Blank	Granite dike	Blank	Granite	Blank	Labradorite	Blank	Serpentine	Blank	Gabbro	Blank	Orthogneiss
Old igneous rocks	Blank	Augen gneiss	Blank	Granitic gneiss	Blank	Concordant granite	Blank	Granitic complex	Blank	Porphyritic granite	Blank	Alkali granite
	Blank	Anisygnies Granite	Blank	Stratiform granite, migmatitic granite	Blank	Pyroxenite	Blank	Charnockite	Blank	Dunite		
Pre-Cambrian Crystalline Schists	Blank	Graphite	Blank	Quartzite	Blank	Marble	Blank	Amphibolite				
Common facies in different formations	Blank	Gneiss	Blank	Leptinite								
Vehivavy System (Vahloany Group)	Blank	Gneiss	Blank	Leptinite								
Graphite System (Ampahy Group)	Blank	Gneiss	Blank	Leptinite								
Ampandrandava Group	Blank	Lentils-ira Bed, Leptinite	Blank	Mafley Bed; Gneiss, marble								
Isanomaro Group	Blank	Ty-lamaha Bed, Leptinite	Blank	Amibe Bed, Gneiss, quartzite								
Fort Dauphin Group	Blank	Antsakamary Bed; Leptinite, quartzite, gneiss, pyroxenite	Blank	Tranomaro Bed; Gneiss, marble, pyroxenite								
	Blank	Leptinite, granite, gneiss	Blank	Leptinite								
	Blank	Leptinite	Blank	Leptinite								
	Blank	Granitic rock										
Dips	Blank	Dip < 45°	Blank	Dip > 45°	Blank	Vertical	Blank	Horizontal	Blank	Anticline	Blank	Syncline
Overturned anticline	Blank	Overturned anticline	Blank	Schistosity	Blank	Plunging axis	Blank	Visible fault	Blank	Presumed fault		
Mylonite	Blank	Pegmatite	Blank	Quartz vein								
Idine	Blank	Tunnel	Blank	Open pit								
Phlogopite	Blank	Muscovite	Blank	Quartz	Blank	Rose quartz	Blank	Graphite	Blank	Amethyst		
Cu	Blank	Mn	Blank	Beryl	Blank	Tourmaline	Blank	Euxenite	Blank	Thorianite		
Chrysotile	Blank	Kaolin	Blank	Jasper	Blank	Apatite	Blank	Fluorite	Blank	Thorianite		
Corundum	Blank	Allanite	Blank	Sapphirine	Blank	Sheelite	Blank	Tantalite	Blank	Magnetite		
Bauxite	Blank	Cassiterite	Blank	Pyrite	Blank	Pyrite, molybdenite	Blank	Ilmenite				
Zircon	Blank	Monazite	Blank	Ilmenite	Blank	Zircon-Monazite sand						
Limestone	Blank	Quarry	Blank	Hot spring								

CARTE DE MADAGASCAR AU 1:100,000
 1:100,000
 Coupures dérivées de la carte internationale du monde
 au 1:500,000

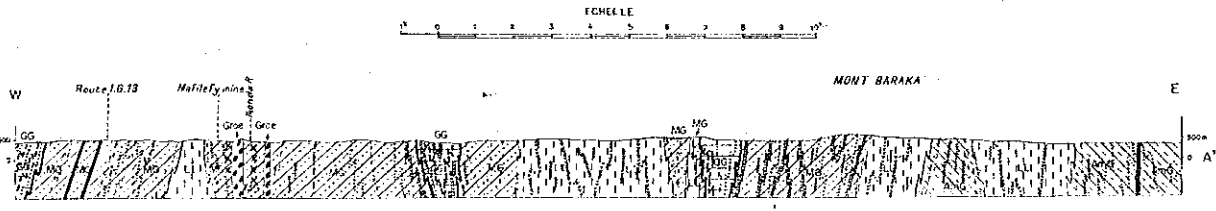
IMANOMBO
 F01 J 60 BERAKETA

Les photographies aériennes ont été prises par l'I.P.F.R.
 Les photographies aériennes ont été prises par l'I.P.F.R.
 Les photographies aériennes ont été prises par l'I.P.F.R.



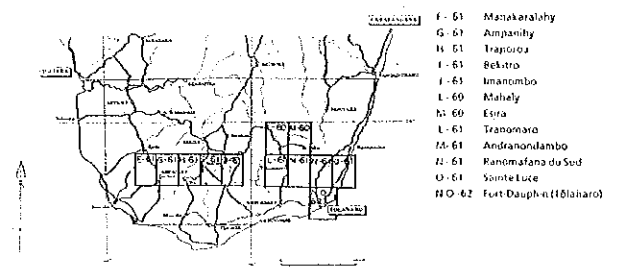
F01 J 60 BERAKETA

F01 J 60 BERAKETA



PL. 3-1-5

THE MINERAL EXPLORATION
 IN
 THE SOUTHERN AREA
 THE DEMOCRATIC REPUBLIC OF MADAGASCAR
 (PHASE I)
 GEOLOGICAL MAP AND PROFILE
 OF THE IMANOMBO DISTRICT (5)



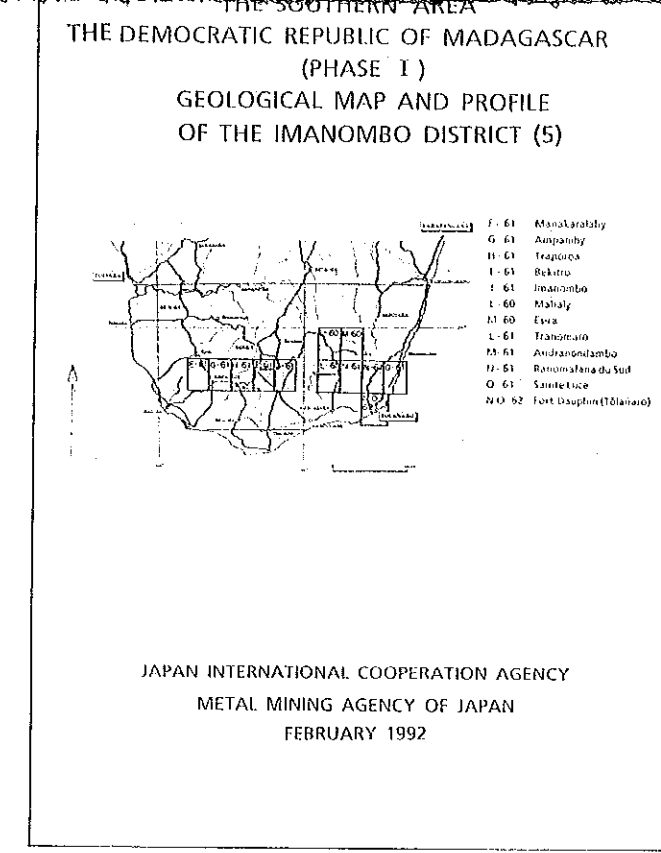
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- G-51 Ampahily
- H-51 Tropsora
- I-51 Bekato
- J-51 Imanombo
- K-51 Mahely
- L-51 Etra
- M-51 Tranomaro
- N-51 Andranondambo
- O-51 Ranomafana du Sud
- U-51 Sainte-Luce
- NO-62 Fort Dauphin (Tôlanaro)

JAPAN INTERNATIONAL COOPERATION AGENCY
 METAL MINING AGENCY OF JAPAN
 FEBRUARY 1992

Scale 1 : 100,000

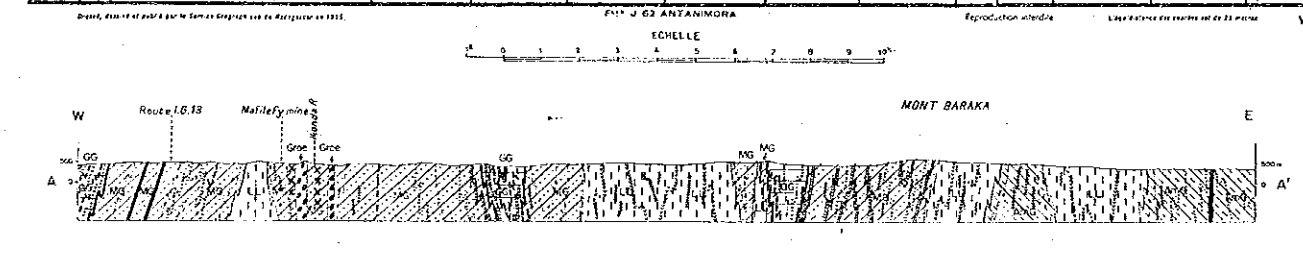
LEGEND

Holocene	Alluvium					
Neogene	Andranombo Series: Mudstone, sandstone					
Recent/Quaternary Rocks	Basalt-Dolerite dike	Rhyolite dike	Microgranite	Microsyenite		
Oligocene Rocks	Granite dike	Granite	Gabbro			
	Labradorite	Serpentine	Orthogneiss			
	Augen gneiss	Granite gneiss	Porphyritic granite			
	Concordant granite	Granitic complex	Alkali granite			
	Anosyennes Granite	Stratiform granite, migmatite granite				
	Pyroxenite	Charnokite	Dunite			
Precambrian Crystalline Schist						
Common facies in different formations	Graphite	Quartzite	Marble	Amphibolite		
Vohibery System (Vohibery Group)	Gneiss	Leptinite				
Graphite System (Ampahily Group)	Gneiss	Leptinite				
Ampahily System	AG Gneiss	MG Marble Bed; Gneiss, marble				
	LL Lanissitra Bed; Leptinite	AmG Amble Bed; Gneiss, quartzite				
	TL Tsamaha Bed; Leptinite	TG Tranomaro Bed; Gneiss, marble, pyroxenite				
	AL Anisaloamany Bed; Leptinite, quartzite, gneiss, pyroxenite					
Fort-Dauphin Group	L Leptinite, granulite, gneiss	Lgc Leptinite	Lyg Granite rock			
Symbols	Dip < 45°	Dip > 45°	Vertical	Horizontal	Anticline	Syncline
Overturned anticline	Overturned syncline	Schistosity	Plunging axis	Visible fault	Presumed fault	
Mylonite	Pegmatite	Quartz vein				
Mine	Tunnel	Open pit				
Phlogopite	Muscovite	Quartz	Rose quartz	Graphite	Graphite vein	
Cu	Mn	Beryl	Tourmaline	Euxenite	Amethyst	
Chrysothite	Kaolin	Jasper	Apatite	Fluorite	Thorianite	
Corundum	Alfante	Sapphire	Sheelite	Tantalite	Magnetite	
Bauxite	Calcite	Pyrite	Pyrite, molybdenite			
Zircon	Monazite	Kimberite	Zircon	Monazite sand		
Greenstone	Quartz	Hot spring				



LEGEND

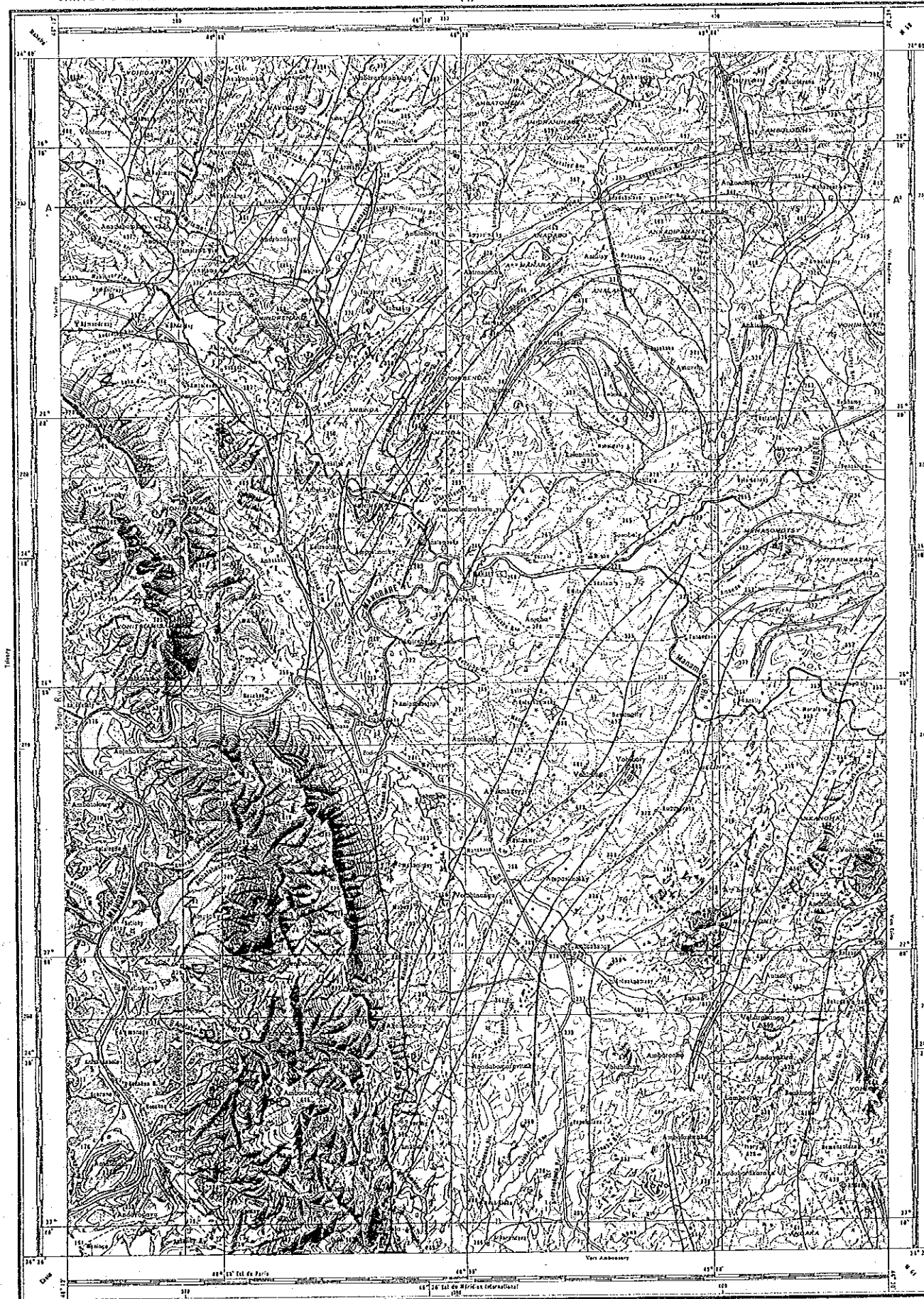
Aluvium	Aluvium	Basalt-dolerite dike	Rhyolite dike	Microgranite	Microsyenite
Recent/Recent Rocks	Andranabo Series, Mudstone, sandstone	Granite dike	Granite	Gabbro	
Old Igneous Rocks	Tabadolite	Serpentine	Augengneiss	Granitic gneiss	Orthogneiss
	Concordant granite	Granitic complex	Anosyennes Granite	Stratiform granite, migmatite granite	Alth granite
	Pyroxenite	Charnockite	Quartzite	Marble	Amphibolite
PreCambrian Crystalline Schist	Graphite	Gneiss	Leptinite	Gneiss	Leptinite
Common facies in different formations	Vohibory System (Vohibory Group)	Graphite System (Ampahary Group)	Ampahary Group	Imanombo Group	Antsalomary Group
	Ampahary Group	Imanombo Group	Antsalomary Group	Fort Dauphin Group	Fort Dauphin Group
Structural Symbols	Dip > 45°	Overturned anticline	Overturned syncline	Schistosity	Horizontal
	Mylonite	Trench	Tunnel	Open pit	Anticline fault
	Phlogopite	Muscovite	Quartz	Rose quartz	Graphite vein
	Cu	Mn	Beryl	Tourmaline	Euxenite
	Epidote	Kaphin	Jasper	Apatite	Fluorite
	Corundum	Allantite	Sapphire	Sheelite	Tantalite
	Zircon	Cassiterite	Pyrite	Pyrite, molybdenite	Ilmenite
	Limestone	Quarry	Hot spring		



CARTE DE MADAGASCAR AU 100.000^e

MAHALY

FEUILLE L-60

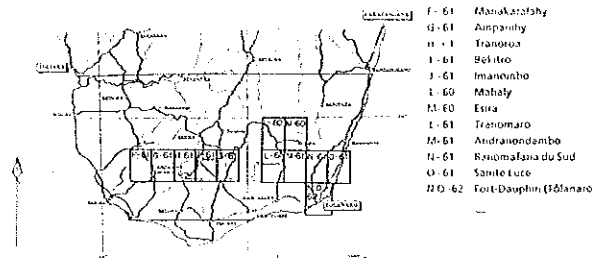


Relevé de points par le Service Géologique de Madagascar en 1958.
 Copie de l'état géologique à l'échelle 1:100,000 établie par 1973 des photographies aériennes rectifiées.
 Comparaison de l'état de l'état : actualisée sur la base de 1983.
 Interprétation actuelle.

Echelle 1 : 100.000

PL. 3-1-6

THE MINERAL EXPLORATION
 IN
 THE SOUTHERN AREA
 OF THE DEMOCRATIC REPUBLIC OF MADAGASCAR
 (PHASE 1)
 GEOLOGICAL MAP AND PROFILE
 OF THE MAHALY DISTRICT (6)



JAPAN INTERNATIONAL COOPERATION AGENCY
 METAL MINING AGENCY OF JAPAN
 FEBRUARY 1992

Scale 1 : 100,000

LEGEND

Holocene		Alluvium		Rhyolite dike		Microgranite		Microsyenite
Neogene		Andranosoa Series, Mudstone, sandstone		Basalt-Dolerite dike		Granite		Gabbro
Recent igneous Rocks		Granite dike		Serpentinite		Porphyritic granite		Alkali granite
Old igneous Rocks		Lavasandstone		Granite gneiss		Stratiform granite, migmatitic granite		Dunite
Precambrian Crystalline Schist		Augen gneiss		Granite complex		Common facies in different formations		Marble
Common facies in different formations		Concordant granite		Serpentinite		Amphibole		Amphibole
Volcanary System (Vohibory Group)		Andryenne Granite		Garnet gneiss		Leptinite		Leptinite
Graphite System (Amparify Group)		Pyroxenite		Gneiss		Leptinite		Leptinite
Androyen System		Amphandranava Group		Gneiss		Marble		Marble
		Tranomaro Group		Leptinite		Marble		Marble
		Antsakoamiary Bed, Leptinite, quartzite, gneiss, pyroxenite		Marble		Marble		Marble
		Fort-Dauphin Group		Leptinite, granite, gneiss		Leptinite		Leptinite
Symbols		Dip < 45°		Dip > 45°		Vertical		Horizontal
		Overturned anticline		Overturned syncline		Schistosity		Plunging axis
		Mylonite		Pegmatite		Quartz vein		Anticline
		Mine		Tunnel		Open pit		Syncline
		Phlogopite		Muscovite		Quartz		Rose quartz
		Cu		Mn		Beryl		Tourmaline
		Chrysothole		Kaolin		Jasper		Apatite
		Covandum		Afanite		Sapphirite		Sheelite
		Bauxite		Cassiterite		Pyrite		Pyrite, molybdenite
		Zircon		Monazite		Benneite-Zircon Monazite sand		Ilmenite
		Limestone		Quany		Hot spring		