

REPUBLIC OF THE PHILIPPINES  
DEPARTMENT OF NATURAL RESOURCES  
BUREAU OF MINES

REPORTS ON GEOLOGICAL SURVEY  
OF  
NORTHEASTERN LUZON  
PHASE I  
GEOLOGICAL, GEOCHEMICAL AND AEROMAGNETIC SURVEYS

APPENDICES

GEOLOGICAL MAPS	PL. I:1-10	10 sheets
GEOCHEMICAL MAPS	PL. II:1-2	4 sheets
AEROMAGNETIC MAPS	PL. III:1-11	44 sheets

METAL MINING AGENCY  
JAPAN INTERNATIONAL COOPERATION AGENCY  
GOVERNMENT OF JAPAN

REPORT ON GEOLOGICAL SURVEY OF NORTHEASTERN LUZON  
PHASE I. GEOLOGICAL, GEOCHEMICAL AND AEROMAGNETIC SURVEYS (1975)



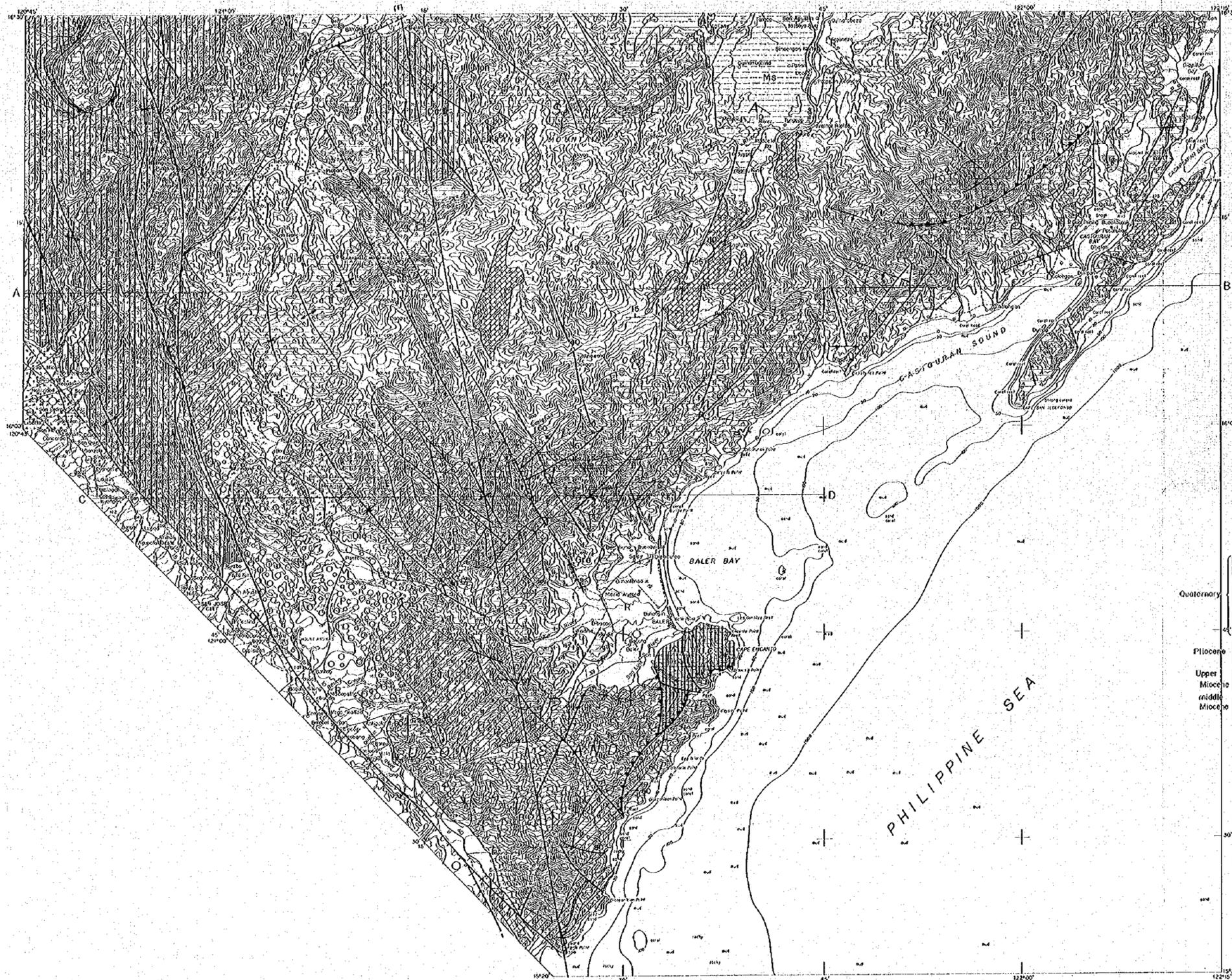
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08853  
国土地理院

GEOLOGICAL SURVEY  
OF  
NORTHEASTERN LUZON  
PHILIPPINES  
(PHASE I)

## GEOLOGICAL MAP

SCALE 1 : 250,000  
0 10 20KM

METAL MINING AGENCY OF JAPAN  
JAPAN INTERNATIONAL COOPERATION AGENCY  
GOVERNMENT OF JAPAN  
October 1975

Prepared by Bishimetal Exploration Co., Ltd.

**LEGEND**

<p><b>Quaternary</b></p> <p>R Recent sand, gravel.</p> <p>Quaternary Volcanics andesite</p> <p>Pantabagan F. conglomerate</p> <p><b>Pliocene</b></p> <p>Madera F. sandstone, mudstone</p> <p><b>Upper Miocene</b></p> <p>Matano F. conglomerate</p> <p><b>middle Miocene</b></p> <p>Aglipay F. limestone, siltstone</p>	<p><b>Lower Miocene</b></p> <p>Santo Fa F. limestone</p> <p><b>Oligocene</b></p> <p>Mamparang F. andesite, basalt, limestone</p> <p>Caraballo G. II basaltic tuff, tuff breccia</p> <p><b>Cretaceous</b></p> <p>Co I andesite</p> <p>Co II andesitic tuff, tuff breccia</p> <p><b>Paleozoic</b></p> <p>BC Basement Complex schist</p>
<p>Peridotite, Pyroxenite</p> <p>Gabbro</p> <p>Diorite</p> <p>Monzonite</p> <p>Granite</p>	<p>Basalt</p> <p>Propylite</p> <p>Andesite, outbrecciated.</p> <p>Dacite</p>
<p>Bedding</p> <p>Synclinal &amp; anticlinal axes</p> <p>Fault, Thrust</p>	

GEOLOGICAL SURVEY  
OF  
NORTHEASTERN LUZON  
PHILIPPINES  
(PHASE I)

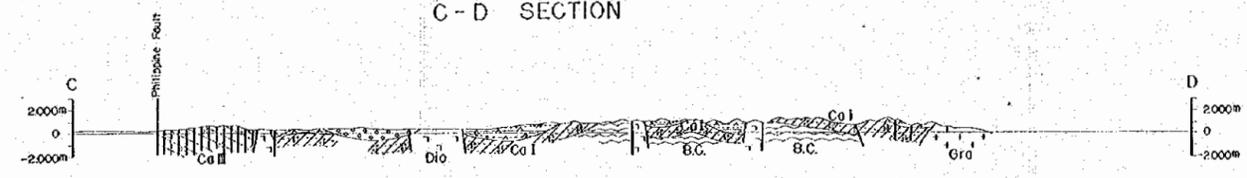
GEOLOGICAL PROFILE



METAL MINING AGENCY OF JAPAN  
JAPAN INTERNATIONAL COOPERATION /  
GOVERNMENT OF JAPAN  
October 1975

Prepared by Bishmetol Exploration Co.,

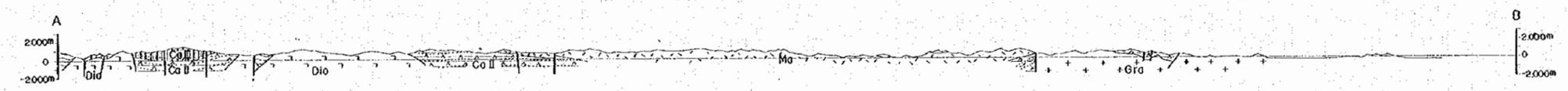
C-D SECTION



E-F SECTION



A-B SECTION



LEGEND

Recent sand, gravel	Lower Miocene	St
Quaternary Volcanics andesite	Oligocene	Mo
Paritabagan F. conglomerate	Pliocene	Ca II
Maddera F. sandstone, mudstone	Upper Miocene	Ca I
Malano F. conglomerate	Middle Miocene	Ca I
Aglipay F. limestone, siltstone	Lower Miocene	BC
Siltstone	Paleozoic	BC
Mudstone, Shale		
Sandstone		
Conglomerate		
Limestone		
Tuff, tuff breccio		
Schist		
Peridotite, Pyroxenite		
Gabbro		
Diorite		
Monzonite		
Granite		

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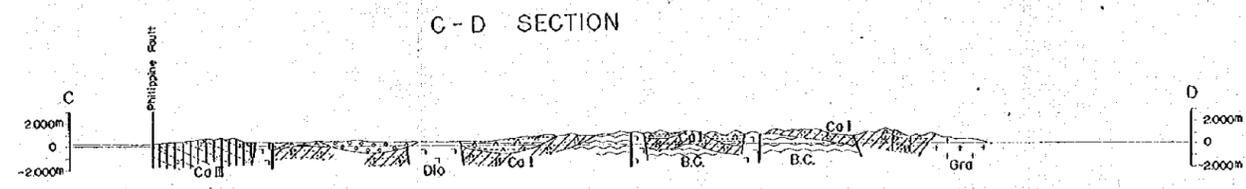
GEOLOGICAL SURVEY  
 OF  
 NORTHEASTERN LUZON  
 PHILIPPINES  
 (PHASE I)

GEOLOGICAL PROFILE



METAL MINING AGENCY OF JAPAN  
 JAPAN INTERNATIONAL COOPERATION AGENCY  
 GOVERNMENT OF JAPAN  
 October 1975

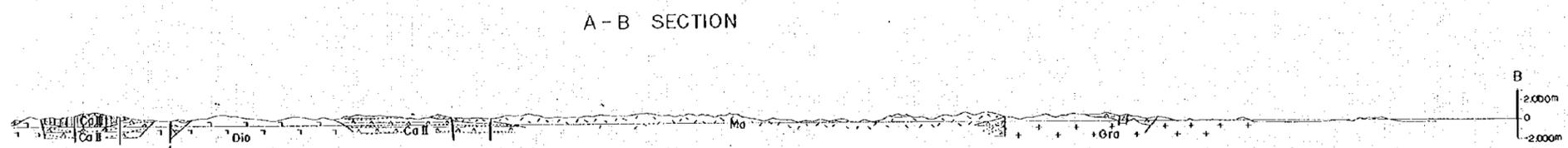
Prepared by Bishmetel Exploration Co., Ltd.



C - D SECTION



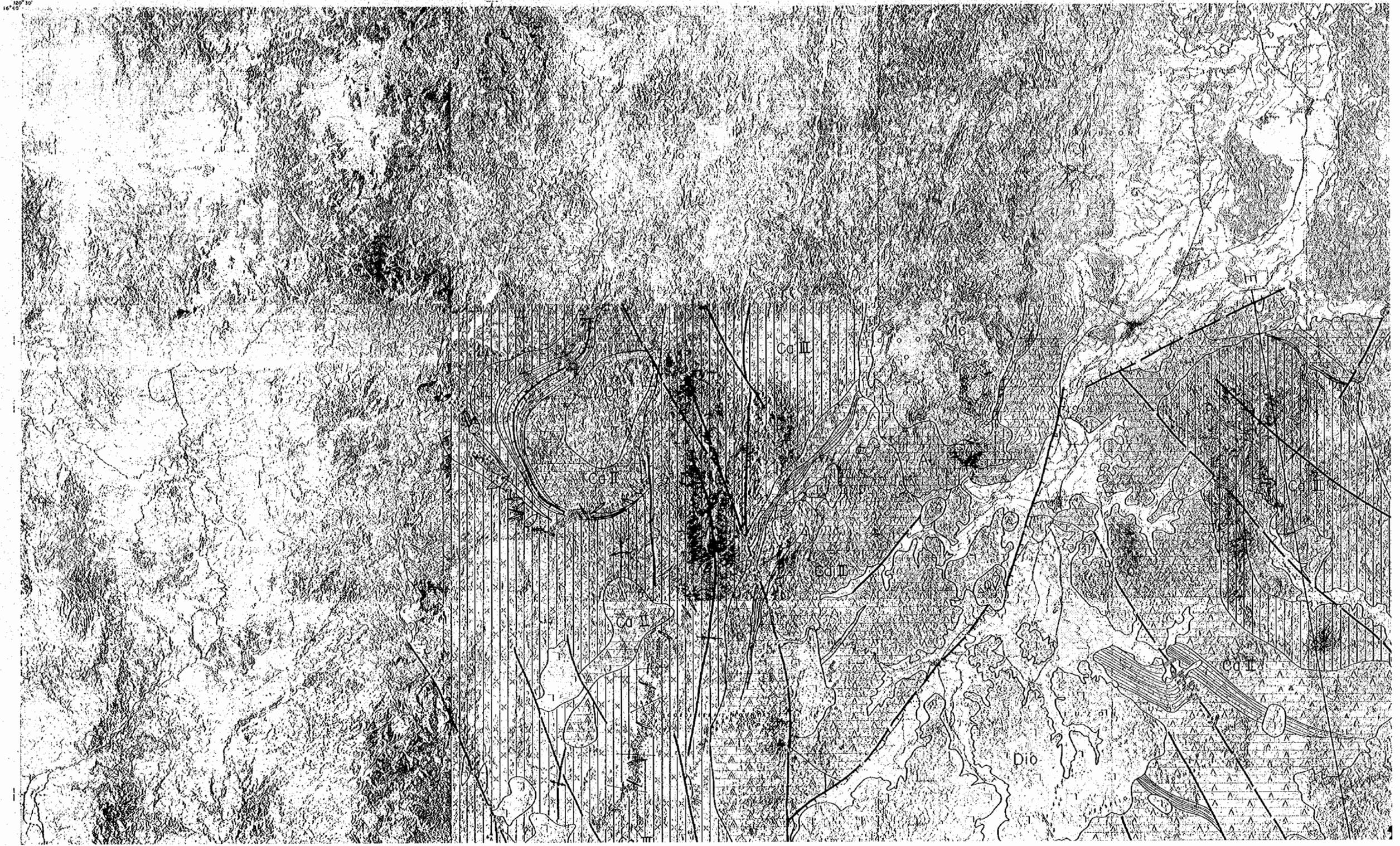
E - F SECTION

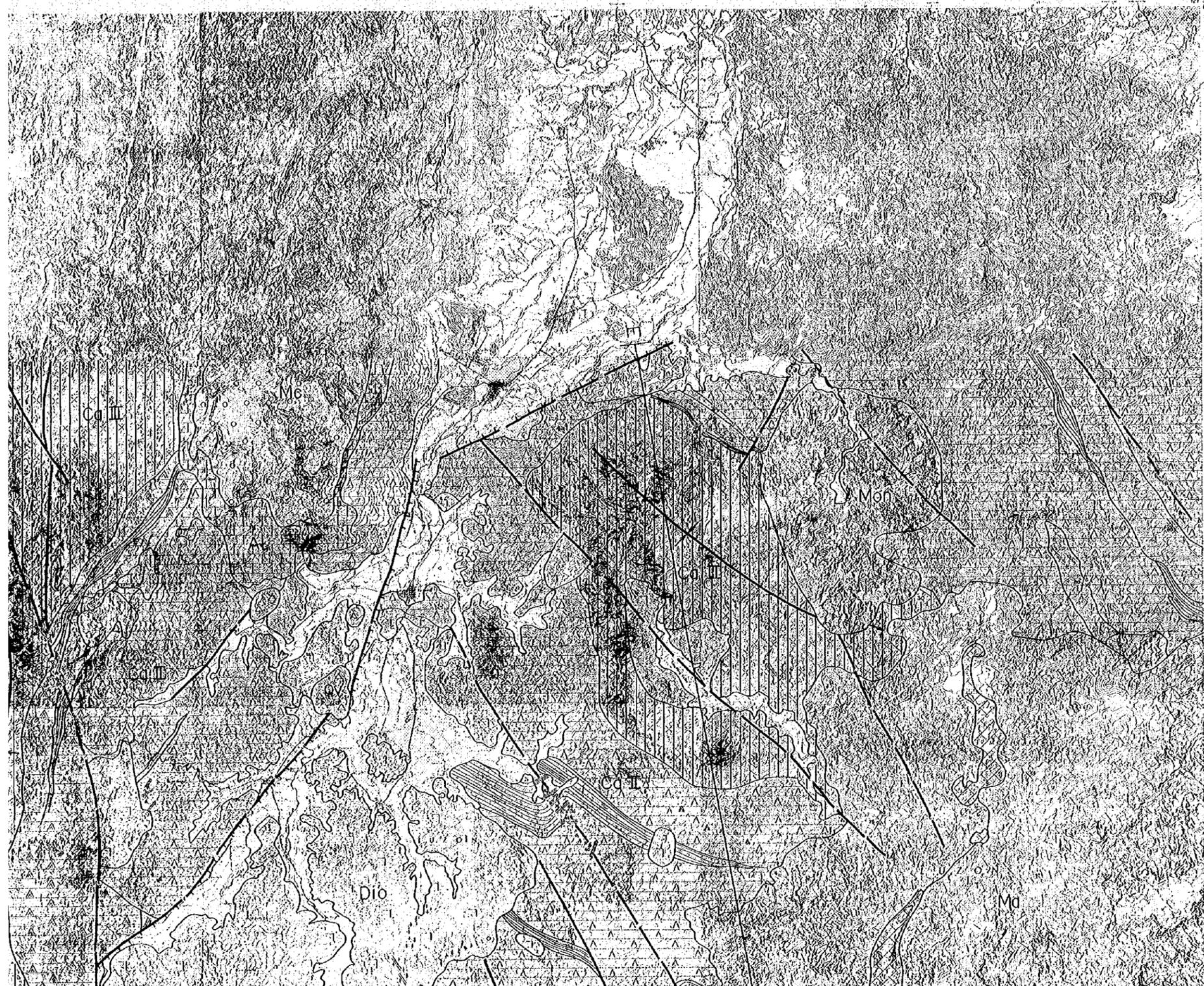


A - B SECTION

LEGEND

Quaternary	R	Recent sand, gravel.	Lower Miocene	Sl	Santa Fe F. limestone
	Qv	Quaternary Volcanics andesite	Oligocene	Mo	Mompangang F. andesite, basalt, limestone
	Po	Pontabagan F. conglomerate	Cretaceous	Co II	Coroballo G. II basaltic tuff, tuff breccia
Pliocene	Ms	Maddera F. sandstone, mudstone		Co I	I andesite
Upper Miocene	Mo	Matano F. conglomerate		Co	I andesite tuff, tuff breccia
Middle Miocene	Ma	Aglipay F. limestone, siltstone	Paleozoic	BC	Basement Complex schist
		Siltstone			Dolerite
		Mudstone, Shale			Porphyrite
		Sandstone			Basalt
		Conglomerate			Propylite
		Limestone			Andesite, outbrecciated
		Tuff, tuff breccia			Dacite
		Schist			Rhyolite
		Peridotite, Pyroxenite			Bedding
		Gabbro			Synclinal & anticlinal axes
		Diorite			Fault, Thrust
		Monzonite			Fossil
		Granite			





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**GEOLOGICAL SURVEY**  
 OF  
**NORTHEASTERN LUZON**  
**PHILIPPINES**  
 (PHASE I)  
**GEOLOGICAL MAP**  
 LOCATION INDEX

SCALE 1 : 100,000  
 0 5 10 KM

METAL MINING AGENCY OF JAPAN  
 JAPAN INTERNATIONAL COOPERATION AGENCY  
 GOVERNMENT OF JAPAN  
 October 1975

Prepared by Dishmetal Exploration Co., Ltd.

**LEGEND**

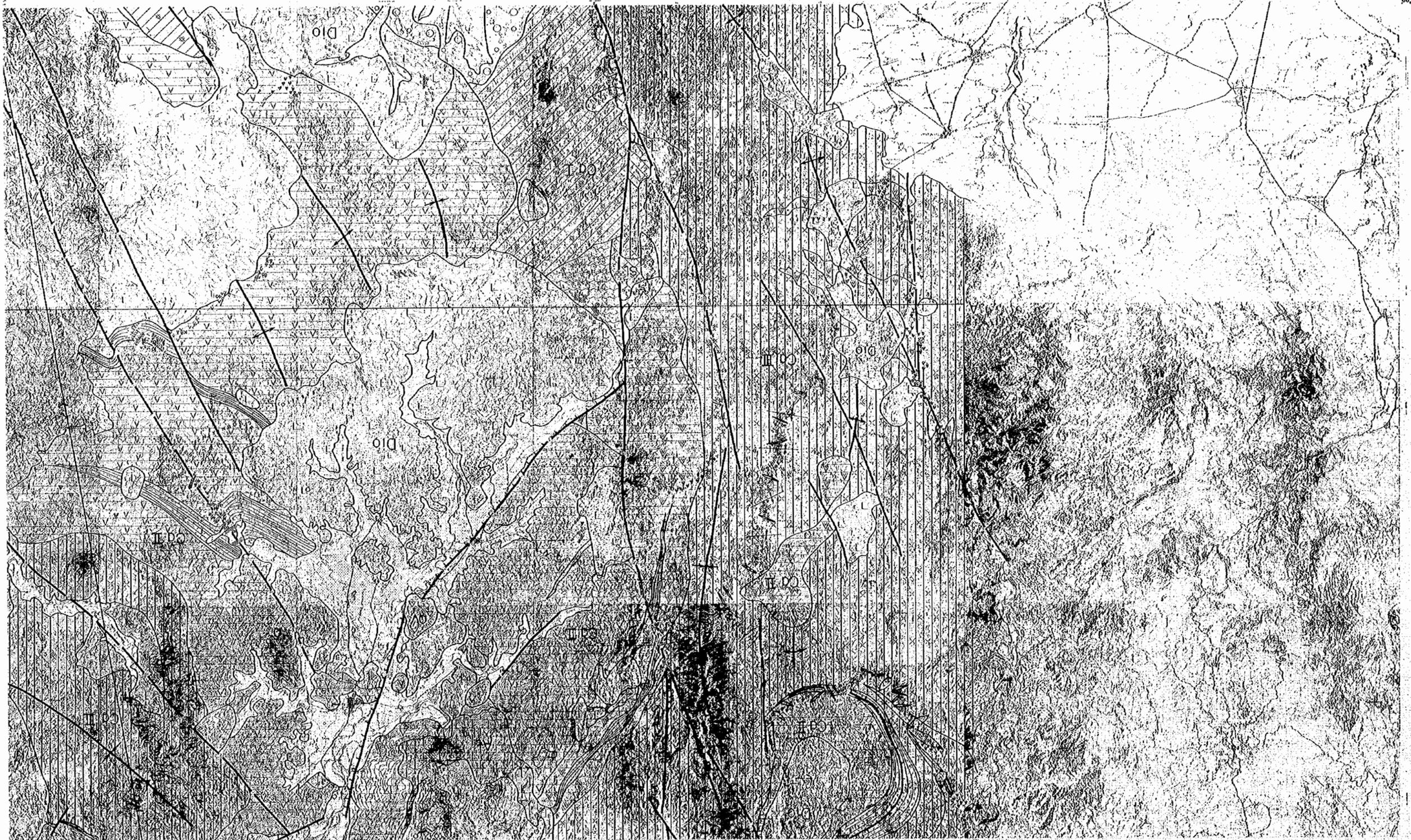
<p><b>Quaternary</b></p> <p>R Recent sand, gravel.</p> <p>Qv Quaternary Volcanics andesite</p> <p>Panibagan F. conglomerate</p>	<p><b>Pliocene</b></p> <p>Ms Moddero F. sandstone, mudstone</p>	<p><b>Upper Miocene</b></p> <p>Matuno F. conglomerate</p>	<p><b>Middle Miocene</b></p> <p>Aglipay F. limestone, siltstone</p>	<p><b>Lower Miocene</b></p> <p>Sf Santa Fa F. limestone</p>	<p><b>Oligocene</b></p> <p>Ma Momparang F. andesite, basalt, limestone</p>	<p><b>Cretaceous</b></p> <p>Ca II Canaballo G. II basaltic tuff, tuff breccia</p> <p>Ca I andesite</p> <p>Ca I andesitic tuff, tuff breccia</p>	<p><b>Paleozoic</b></p> <p>BC Basement Complex schist</p>
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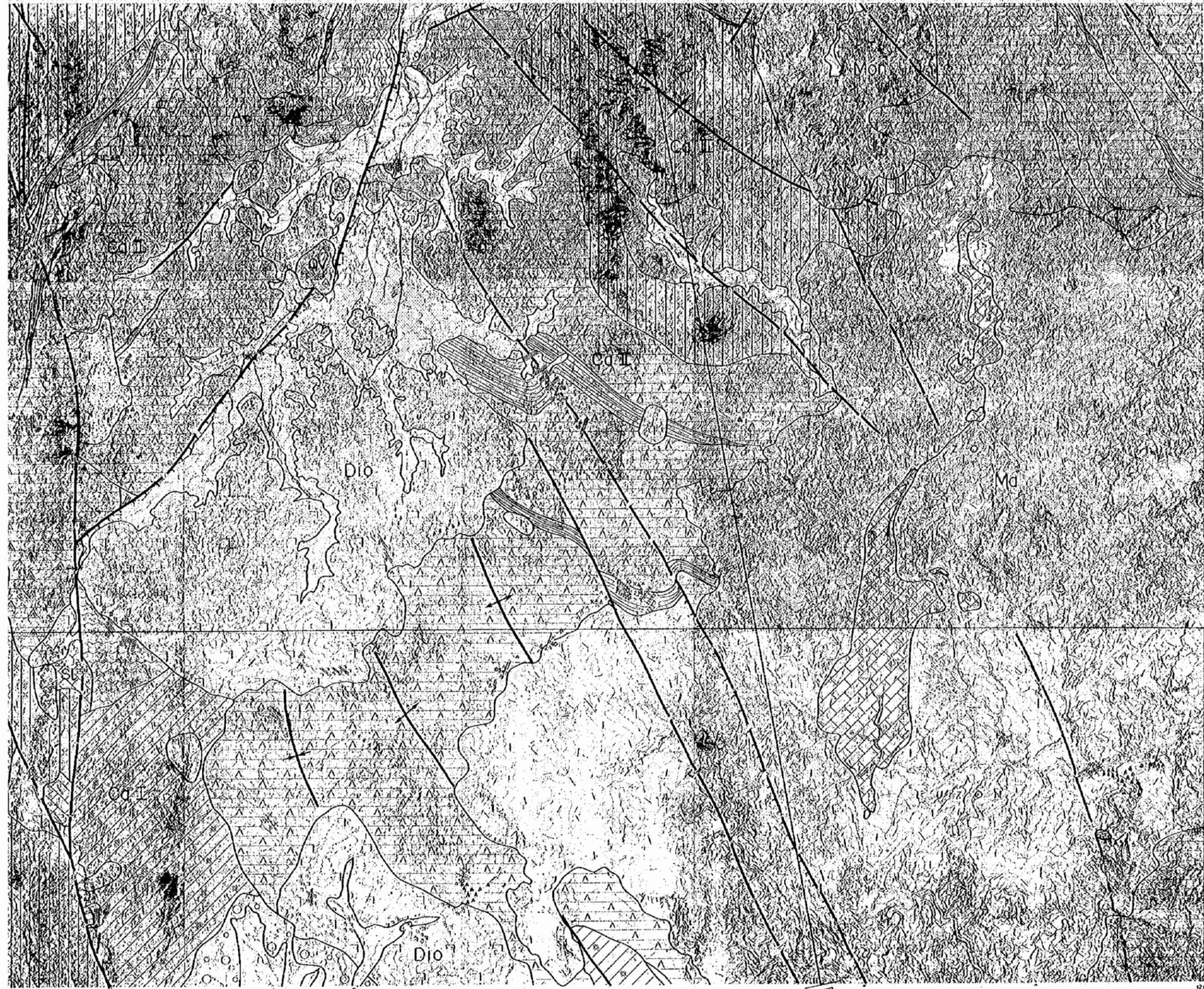
  

<p>Siltstone</p> <p>Mudstone, Shale</p> <p>Sandstone</p> <p>Conglomerate</p> <p>Limestone</p> <p>Tuff, tuff breccia</p> <p>Schist</p>	<p>Dolerite</p> <p>Porphyrite</p> <p>Basalt</p> <p>Propylite</p> <p>Andesite, autobrecciated</p> <p>Dacite</p> <p>Rhyolite</p>
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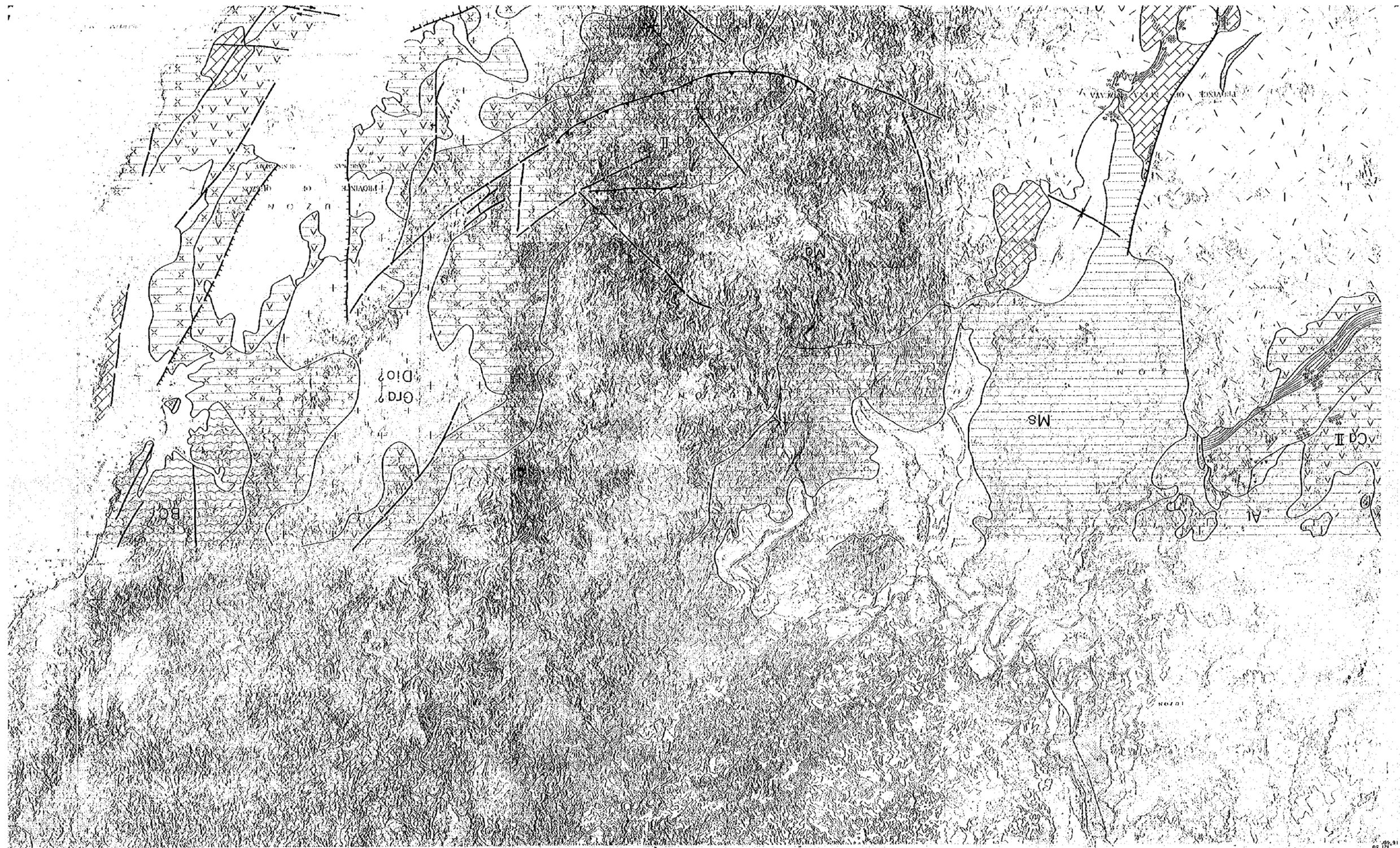
<p>Peridotite, Pyroxenite</p> <p>Gabbro</p> <p>Diorite</p> <p>Monzonite</p> <p>Granite</p>	<p>Bedding</p> <p>Synclinal &amp; anticlinal axes</p> <p>Fault, Thrust</p> <p>Fossil</p>
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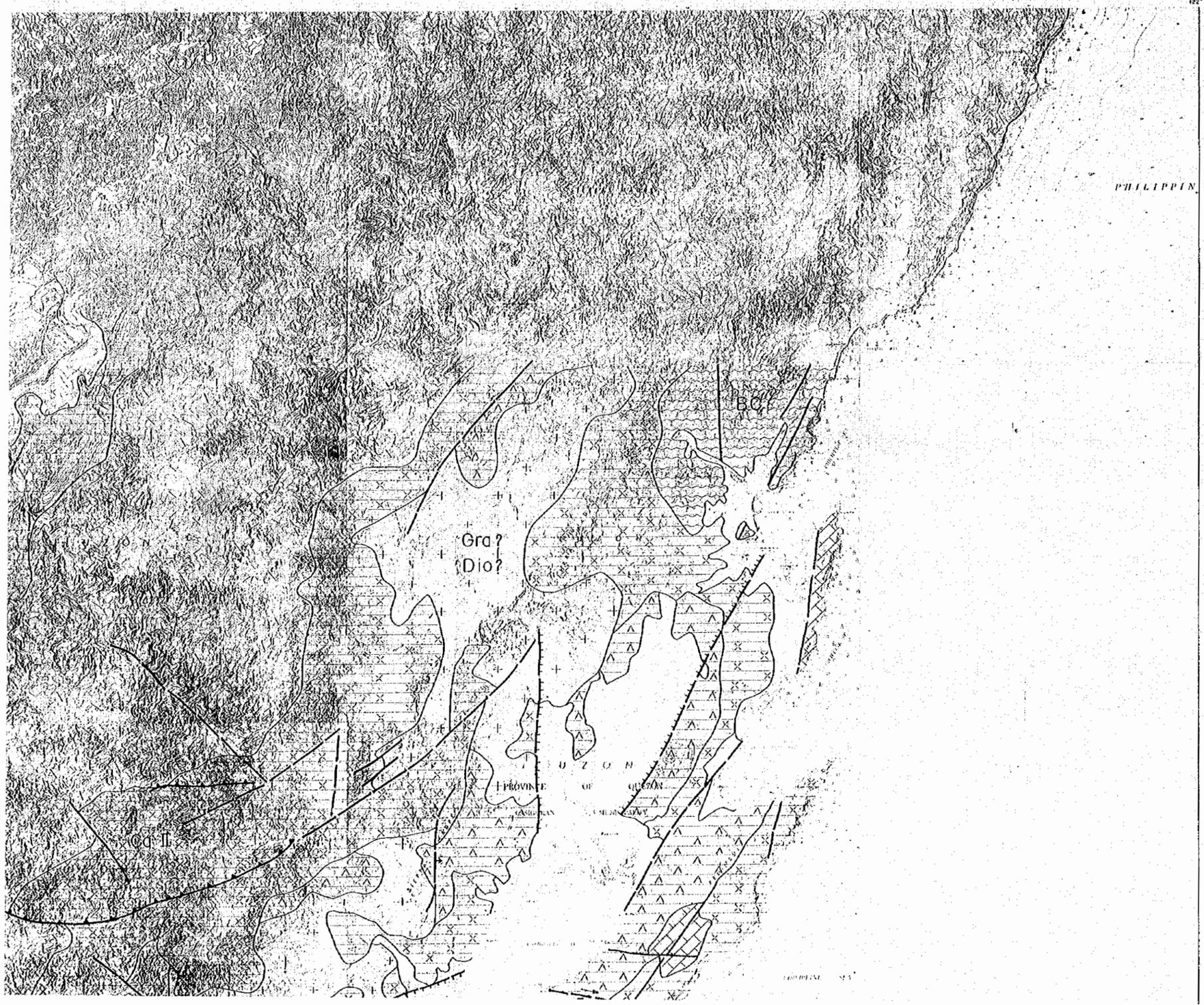




LEGEND

Recent sand, gravel.	R	Lower Miocene	Si	Santa Fe F. limestone
Quaternary Volcanics andesite	Qv	Oligocene	Ma	Momprang F. andesite, basalt, limestone
Pailabagan F. conglomerate	P	Cenozoic	Ca I	Caraballo G. II basaltic tuff, tuff breccia
Pliocene	Ms		Ca II	andesite
Upper Miocene	Mu		Ca III	andesitic tuff, tuff breccia
Middle Miocene	Mm	Paleozoic	BC	Basement Complex schist
Lower Miocene	ML			
Siltstone		Dolerite		
Mudstone, Shale		Porphyrite		
Sandstone		Basalt		
Conglomerate		Propylite		
Limestone		Andesite, autobrecciated		
Tuff, tuff breccia		Dacite		
Schist		Rhyolite		
Peridotite, Pyroxenite		Bedding		
Gabbro		Synclinal & anticlinal axes		
Diorite		Faults, Thrust		
Monzonite		Fossil		
Granite				





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**GEOLOGICAL SURVEY**  
 OF  
**NORTHEASTERN LUZON**  
**PHILIPPINES**  
 (PHASE I)  
**GEOLOGICAL MAP**  
 LOCATION INDEX

SCALE 1 : 100,000

METAL MINING AGENCY OF JAPAN  
 JAPAN INTERNATIONAL COOPERATION AGENCY  
 GOVERNMENT OF JAPAN  
 October 1975

Prepared by Bishimetal Exploration Co., Ltd.

**LEGEND**

<p>Quaternary</p> <ul style="list-style-type: none"> <li>R Recent sand, gravel</li> <li>Qv Quaternary Volcanics andesite</li> <li>Panlabagan F. conglomerate</li> </ul> <p>Pliocene</p> <ul style="list-style-type: none"> <li>Ms Madera F. sandstone, mudstone</li> </ul> <p>Upper Miocene</p> <ul style="list-style-type: none"> <li>Mtuno F. conglomerate</li> </ul> <p>Middle Miocene</p> <ul style="list-style-type: none"> <li>Agilpay F. limestone, siltstone</li> </ul>	<p>Lower Miocene</p> <ul style="list-style-type: none"> <li>Santa Fe F. limestone</li> </ul> <p>Oligocene</p> <ul style="list-style-type: none"> <li>Mamparang F. andesite, basalt, limestone</li> </ul> <p>Coraballo G. II</p> <ul style="list-style-type: none"> <li>basaltic tuff, tuff breccia</li> </ul> <p>Cretaceous</p> <ul style="list-style-type: none"> <li>Ca II andesite</li> <li>Ca I andesitic tuff, tuff breccia</li> </ul> <p>Paleozoic</p> <ul style="list-style-type: none"> <li>Bc Basement Complex schist</li> </ul>
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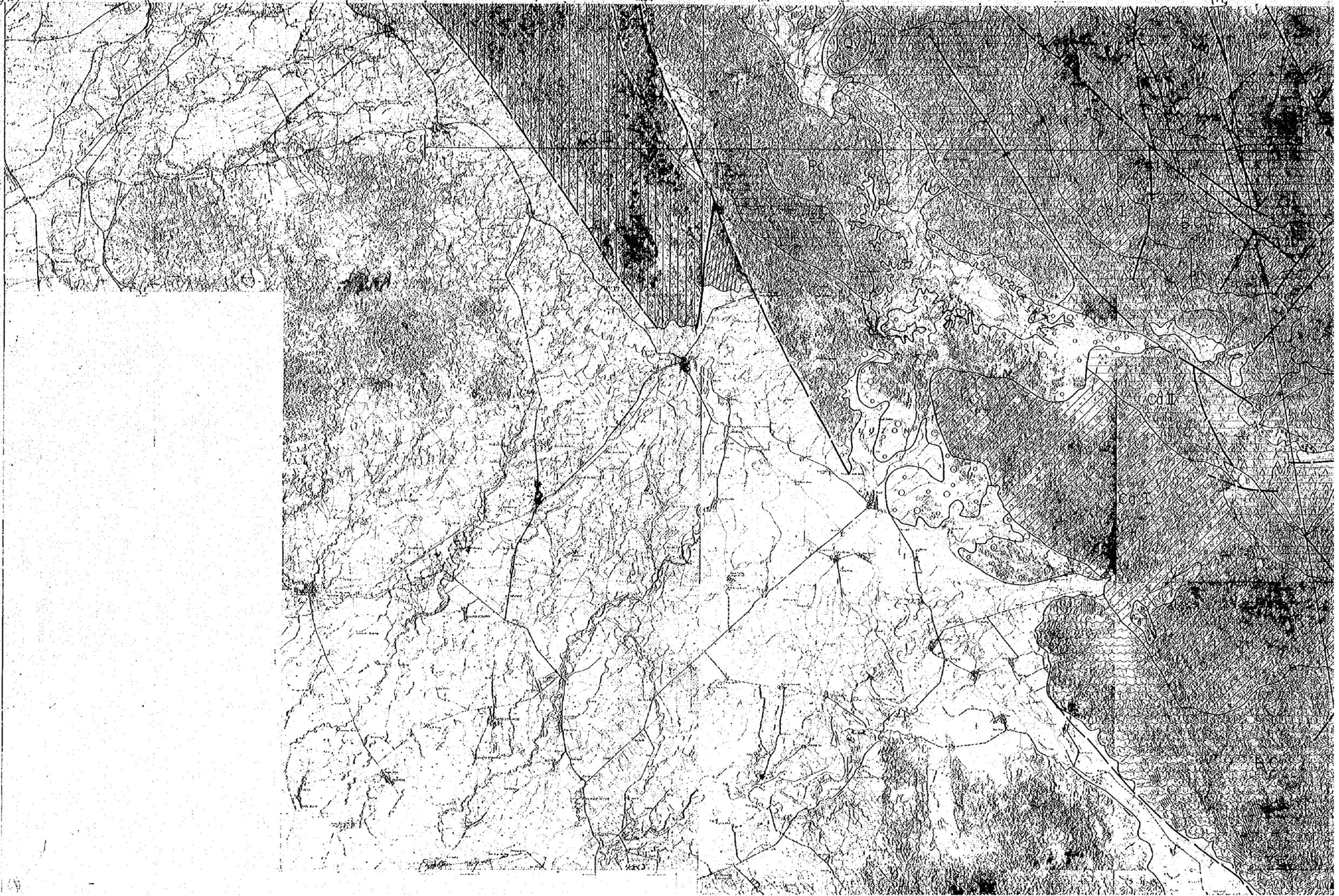
<ul style="list-style-type: none"> <li>Siltstone</li> <li>Mudstone, Shale</li> <li>Sandstone</li> <li>Conglomerate</li> <li>Limestone</li> <li>Tuff, tuff breccia</li> <li>Schist</li> </ul>	<ul style="list-style-type: none"> <li>Dolerite</li> <li>Porphyrite</li> <li>Basalt</li> <li>Propylite</li> <li>Andesite, outbrecciated</li> <li>Dacite</li> <li>Rhyolite</li> </ul>
--	--

<ul style="list-style-type: none"> <li>Peridotite, Pyroxenite</li> <li>Gabbro</li> <li>Diorite</li> <li>Monzonite</li> <li>Granite</li> </ul>	<ul style="list-style-type: none"> <li>Bedding</li> <li>Synclinal &amp; anticlinal axes</li> <li>Fault, Thrust</li> <li>Fossil</li> </ul>
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**GEOLOGICAL SURVEY OF PHILIPPINES**  
**NORTHEASTERN LUZON**  
**(PHASE I)**  
**GEOLOGICAL MAP**  
**LOCATION INDEX**

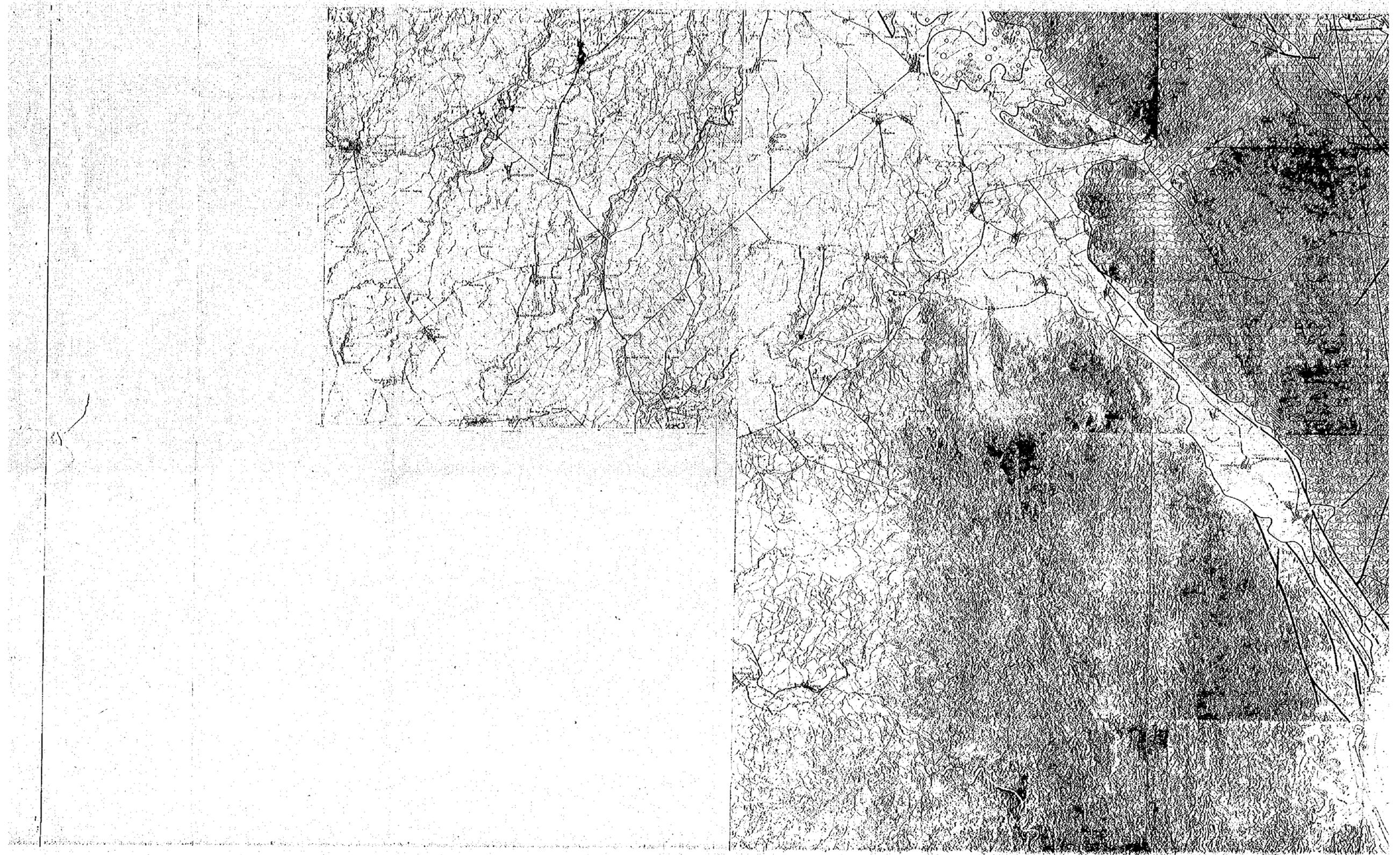
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METAL MINING AGENCY OF JAPAN  
 JAPAN INTERNATIONAL COOPERATION AGENCY  
 GOVERNMENT OF JAPAN  
 October 1975  
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**LEGEND**

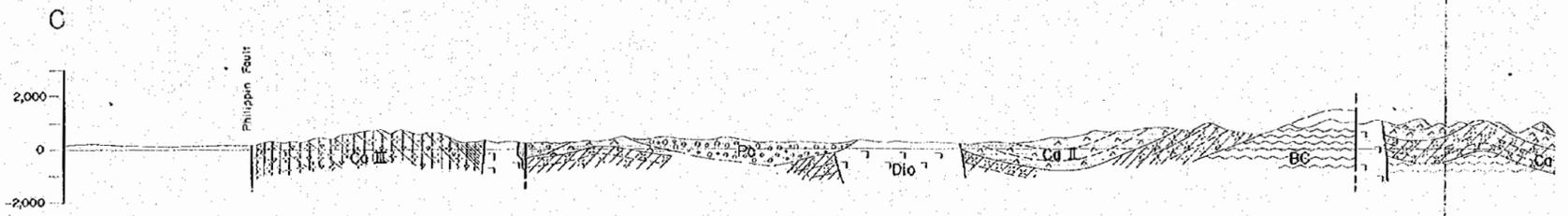
Recent R sand, gravel	Quaternary QV Quaternary Volcanics andesite	Lower Miocene Sgani F. sandstone	Upper Miocene Maluno F. sandstone, mudstone conglomerate	Aglipoy F. M limestone, siltstone	Paleozoic Basement Complex schist
Recent R sand, gravel	Quaternary QV Quaternary Volcanics andesite	Lower Miocene Sgani F. sandstone	Upper Miocene Maluno F. sandstone, mudstone conglomerate	Aglipoy F. M limestone, siltstone	Paleozoic Basement Complex schist
Recent R sand, gravel	Quaternary QV Quaternary Volcanics andesite	Lower Miocene Sgani F. sandstone	Upper Miocene Maluno F. sandstone, mudstone conglomerate	Aglipoy F. M limestone, siltstone	Paleozoic Basement Complex schist
Recent R sand, gravel	Quaternary QV Quaternary Volcanics andesite	Lower Miocene Sgani F. sandstone	Upper Miocene Maluno F. sandstone, mudstone conglomerate	Aglipoy F. M limestone, siltstone	Paleozoic Basement Complex schist
Recent R sand, gravel	Quaternary QV Quaternary Volcanics andesite	Lower Miocene Sgani F. sandstone	Upper Miocene Maluno F. sandstone, mudstone conglomerate	Aglipoy F. M limestone, siltstone	Paleozoic Basement Complex schist
Recent R sand, gravel	Quaternary QV Quaternary Volcanics andesite	Lower Miocene Sgani F. sandstone	Upper Miocene Maluno F. sandstone, mudstone conglomerate	Aglipoy F. M limestone, siltstone	Paleozoic Basement Complex schist
Recent R sand, gravel	Quaternary QV Quaternary Volcanics andesite	Lower Miocene Sgani F. sandstone	Upper Miocene Maluno F. sandstone, mudstone conglomerate	Aglipoy F. M limestone, siltstone	Paleozoic Basement Complex schist
Recent R sand, gravel	Quaternary QV Quaternary Volcanics andesite	Lower Miocene Sgani F. sandstone	Upper Miocene Maluno F. sandstone, mudstone conglomerate	Aglipoy F. M limestone, siltstone	Paleozoic Basement Complex schist
Recent R sand, gravel	Quaternary QV Quaternary Volcanics andesite	Lower Miocene Sgani F. sandstone	Upper Miocene Maluno F. sandstone, mudstone conglomerate	Aglipoy F. M limestone, siltstone	Paleozoic Basement Complex schist
Recent R sand, gravel	Quaternary QV Quaternary Volcanics andesite	Lower Miocene Sgani F. sandstone	Upper Miocene Maluno F. sandstone, mudstone conglomerate	Aglipoy F. M limestone, siltstone	Paleozoic Basement Complex schist







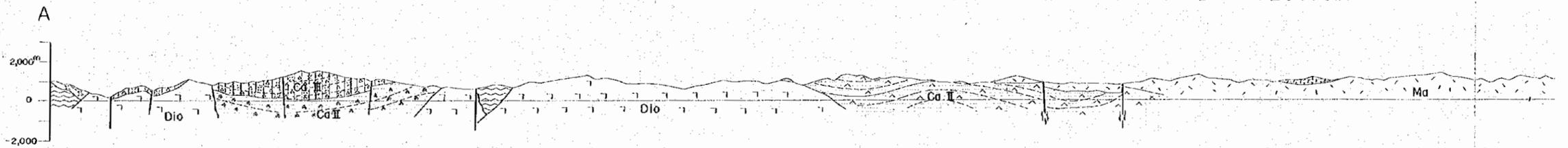
C-D SECTION



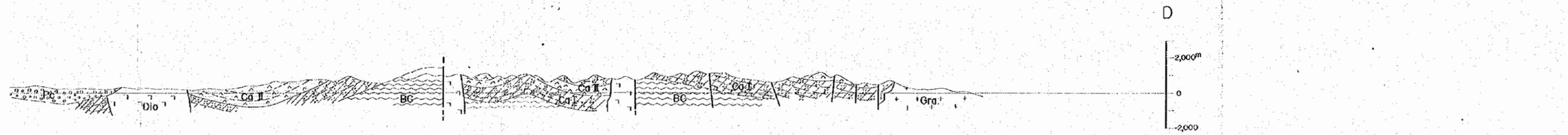
E-F SECTION



A-B SECTION



C-D SECTION



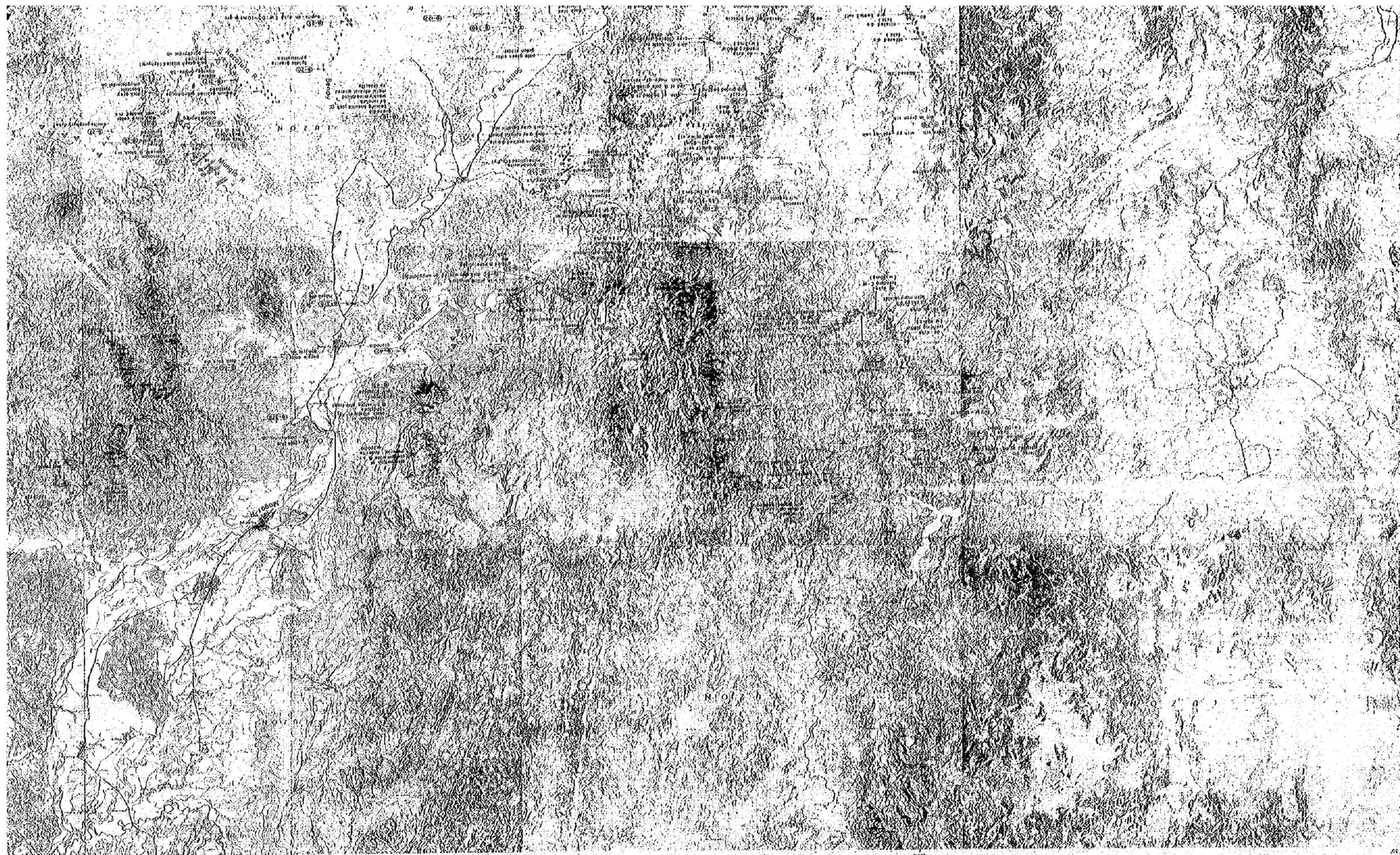
E-F SECTION



A-B SECTION



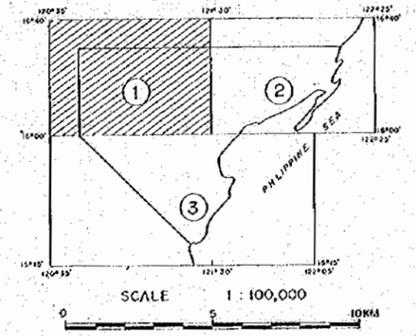








GEOLOGICAL SURVEY  
 OF  
 NORTHEASTERN LUZON  
 PHILIPPINES  
 (PHASE I)  
**ROUTE AND ROCK SAMPLE MAP**  
 LOCATION INDEX

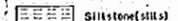
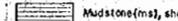
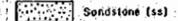
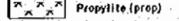
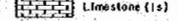
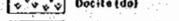
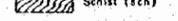
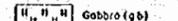
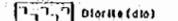
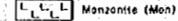


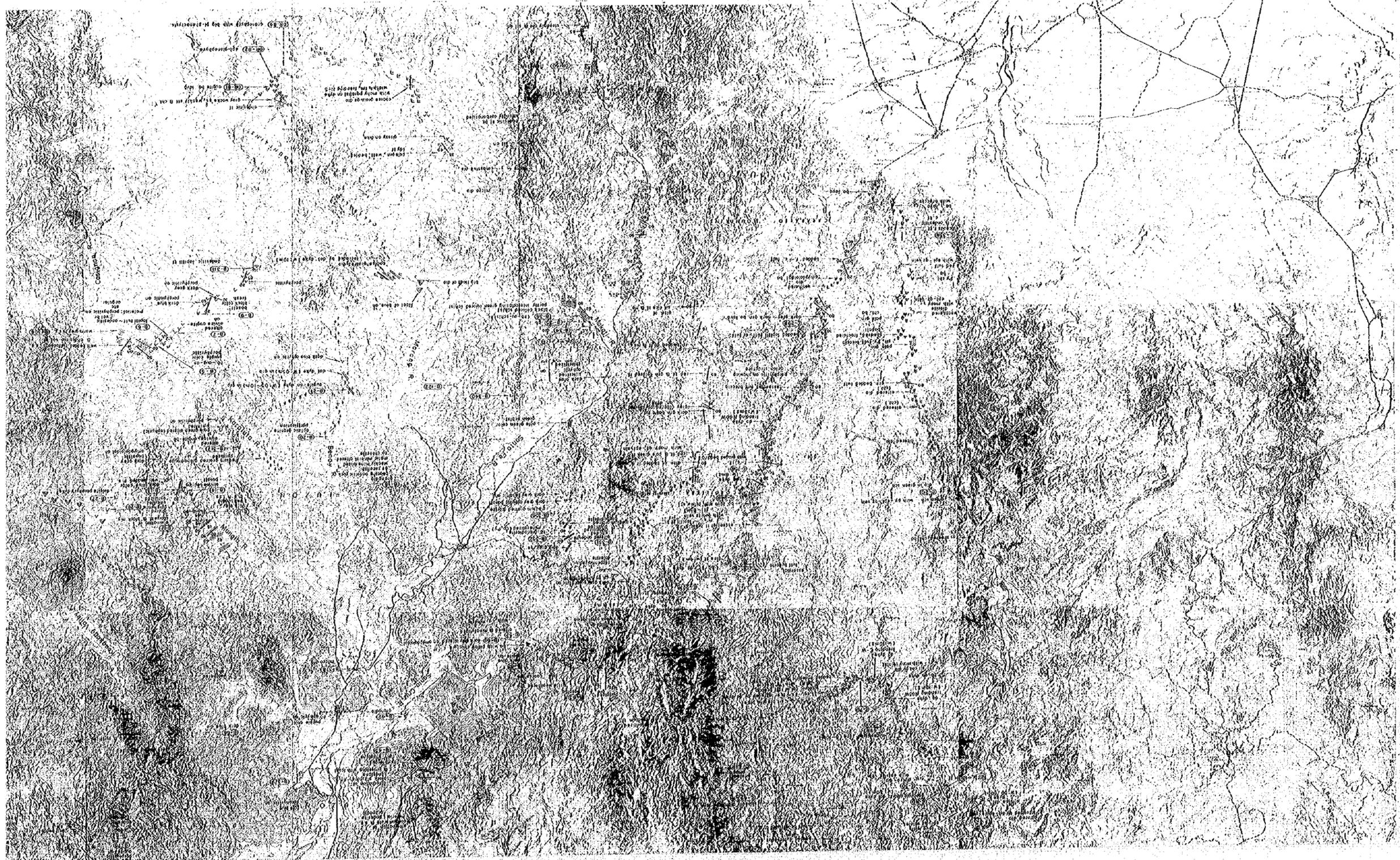
SCALE 1 : 100,000

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 JAPAN INTERNATIONAL COOPERATION AGENCY  
 GOVERNMENT OF JAPAN  
 October 1975

Prepared by Bishmetol Exploration Co., Ltd.

**LEGEND**

 Siltstone (silt)	 Dolerite (dol)
 Mudstone (ms), shale (sh)	 Porphyrite (porph)
 Sandstone (ss)	 Basalt (ba)
 Conglomerate (cgl)	 Propylite (prop)
 Limestone (ls)	 Andesite (an) autobrecciated
 Tuff (tf), tuff breccia (tf br)	 Dacite (da)
 Schist (sch)	 Rhyolite (rhy)
 Beridolite (pd) pyroxenite (pyr)	 Bedding
 Gabbro (gb)	 Synclinal axes
 Diorite (dio)	 Fault
 Monzonite (Mon)	 Fossil
 Granite (gro)	 Sample No





LEGEND.

	Siltstone (sls)		Olivite (ol)
	Mafic (maf)		Periphyrite (per)
	Sandstone (st)		Basalt (ba)
	Conglomerate (cp)		Propylite (pp)
	Limestone (ls)		Andesite (an)
	Tuff (tu)		Gabbro (gb)
	Silt (stch)		Diorite (di)
	Breccia (br)		Monzonite (mn)
	Breccia (br)		Granite (gr)
	Bedding		Fault
	Specimen locations		Fossil
	Sample No.		Sample No.

10° 18' 30"

I U Z O N

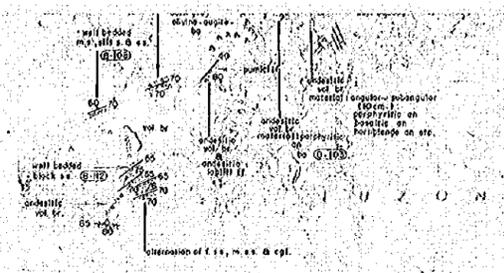
pale brown ls (E-375)  
 andesitic lf ls  
 well bedded m.s. sh. ls (E-108)  
 block ss. (E-107)  
 dark gray micaceous ls (E-105)  
 volcanic ash (E-104)  
 well bedded block ss. (E-103)  
 andesitic volcanic ash (E-102)  
 volcanic ash (E-101)  
 intersection of l.s., m.s. sh. & cgl.

line intersection of brown soft ss & ls

I U Z O N  
 PROVINCE OF IZON  
 CASHUAS

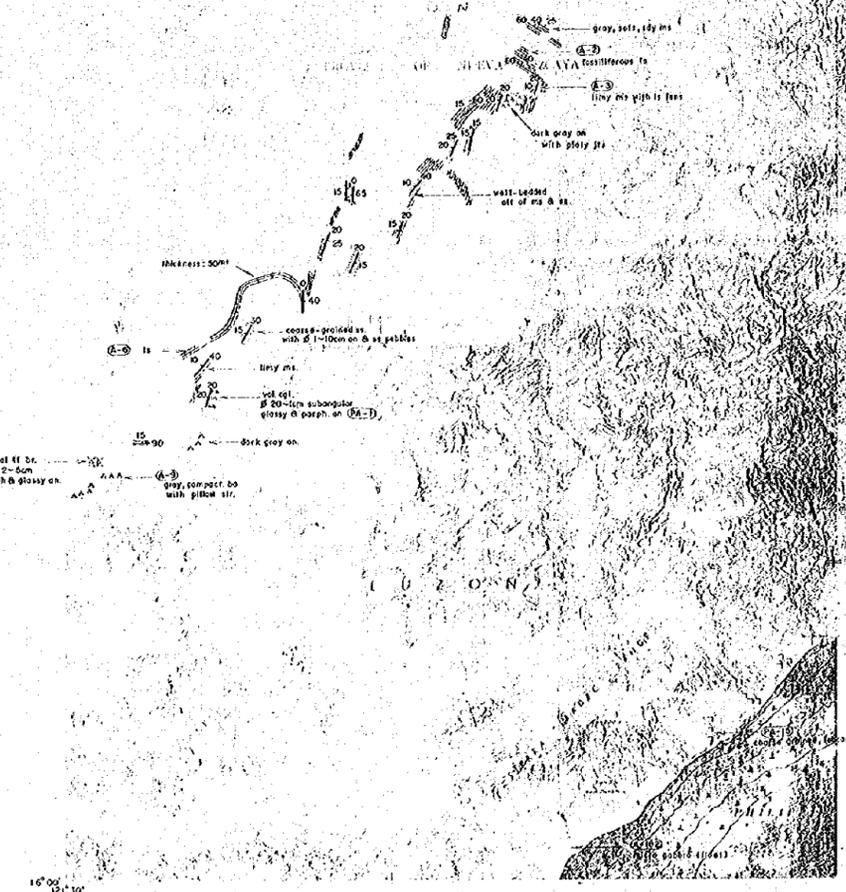
gray, soft, red m.s.  
 fossiliferous ls  
 limy m.s. with ls tabs  
 dark gray on with platy ls  
 well-bedded sh. of m.s. & ls





Use alteration of letters  
 100 ft. 100 ft.

LUZON  
 PROVINCE OF QUEZON  
 CASIGUAN

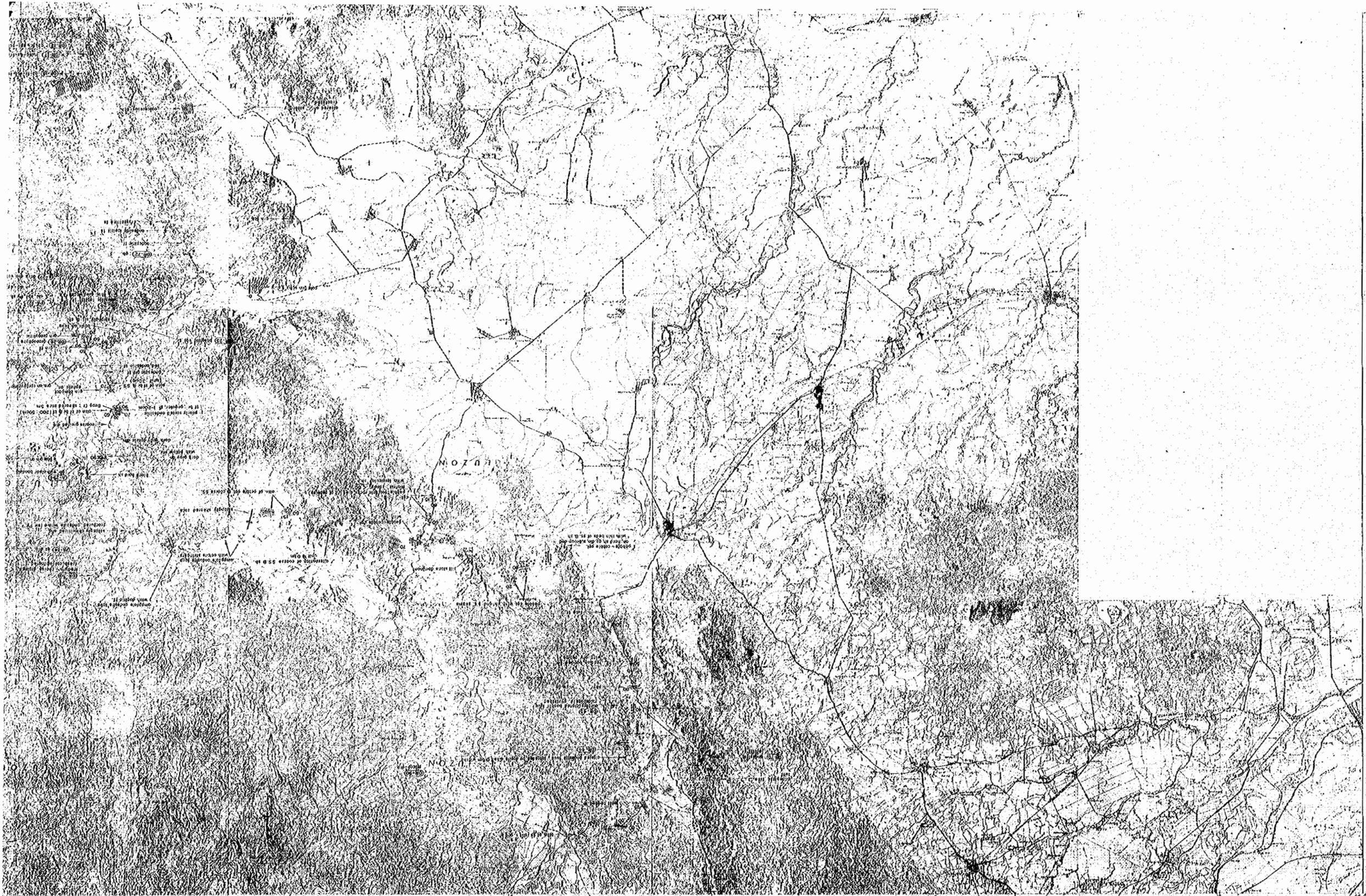


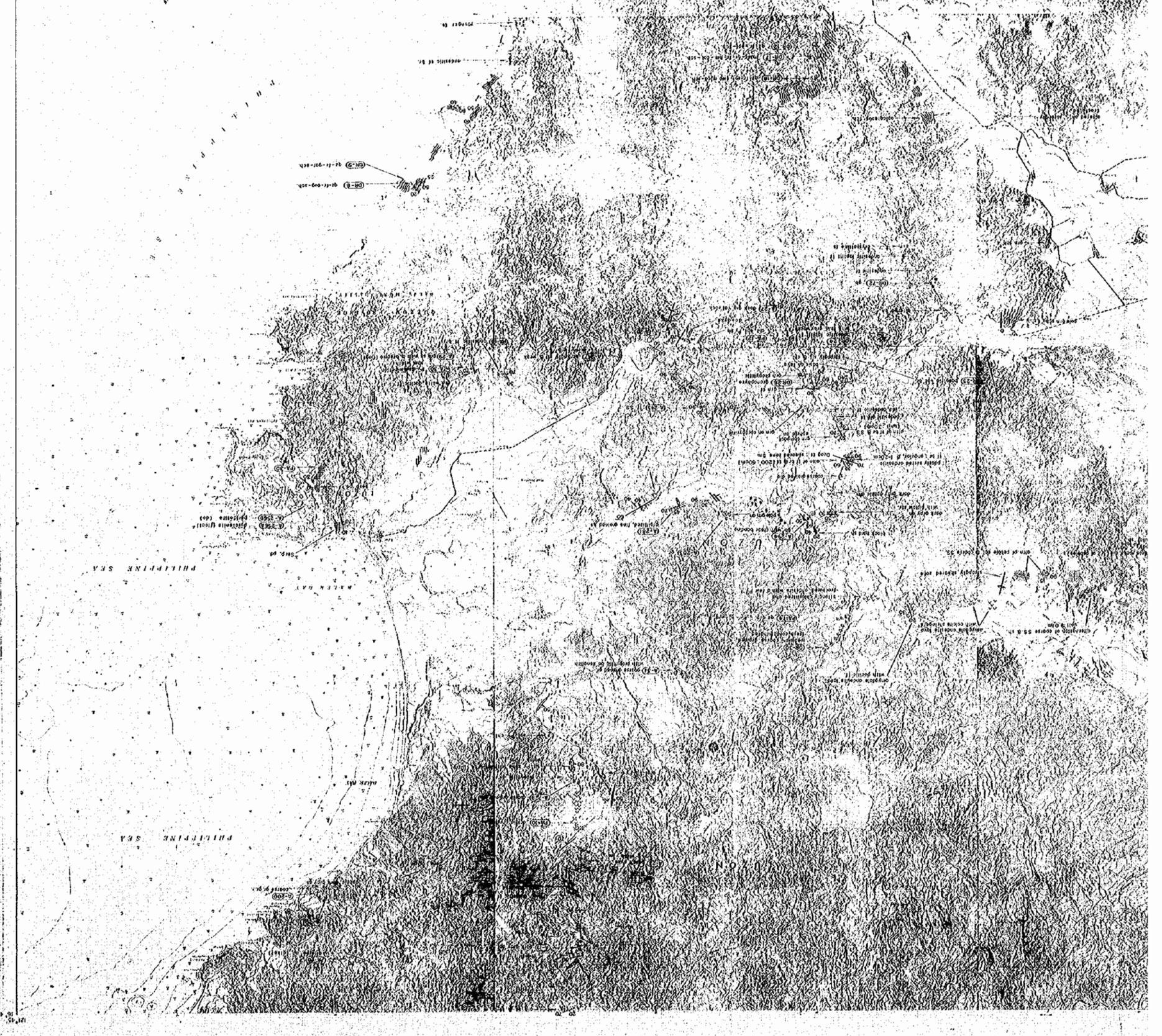
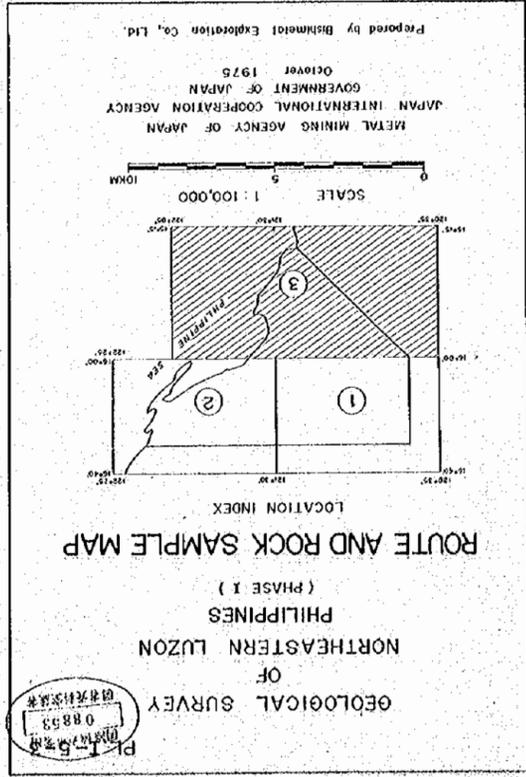
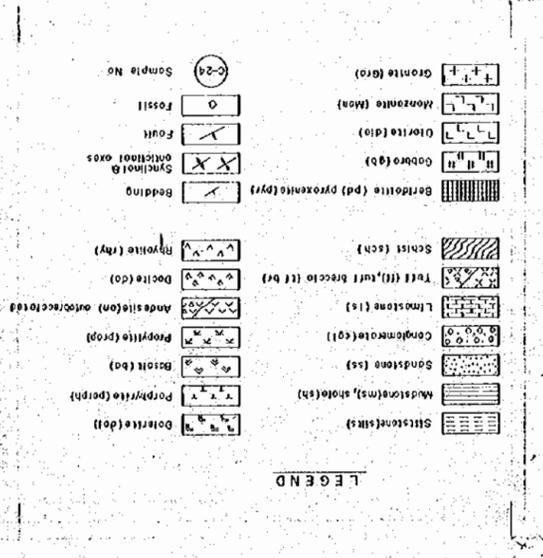
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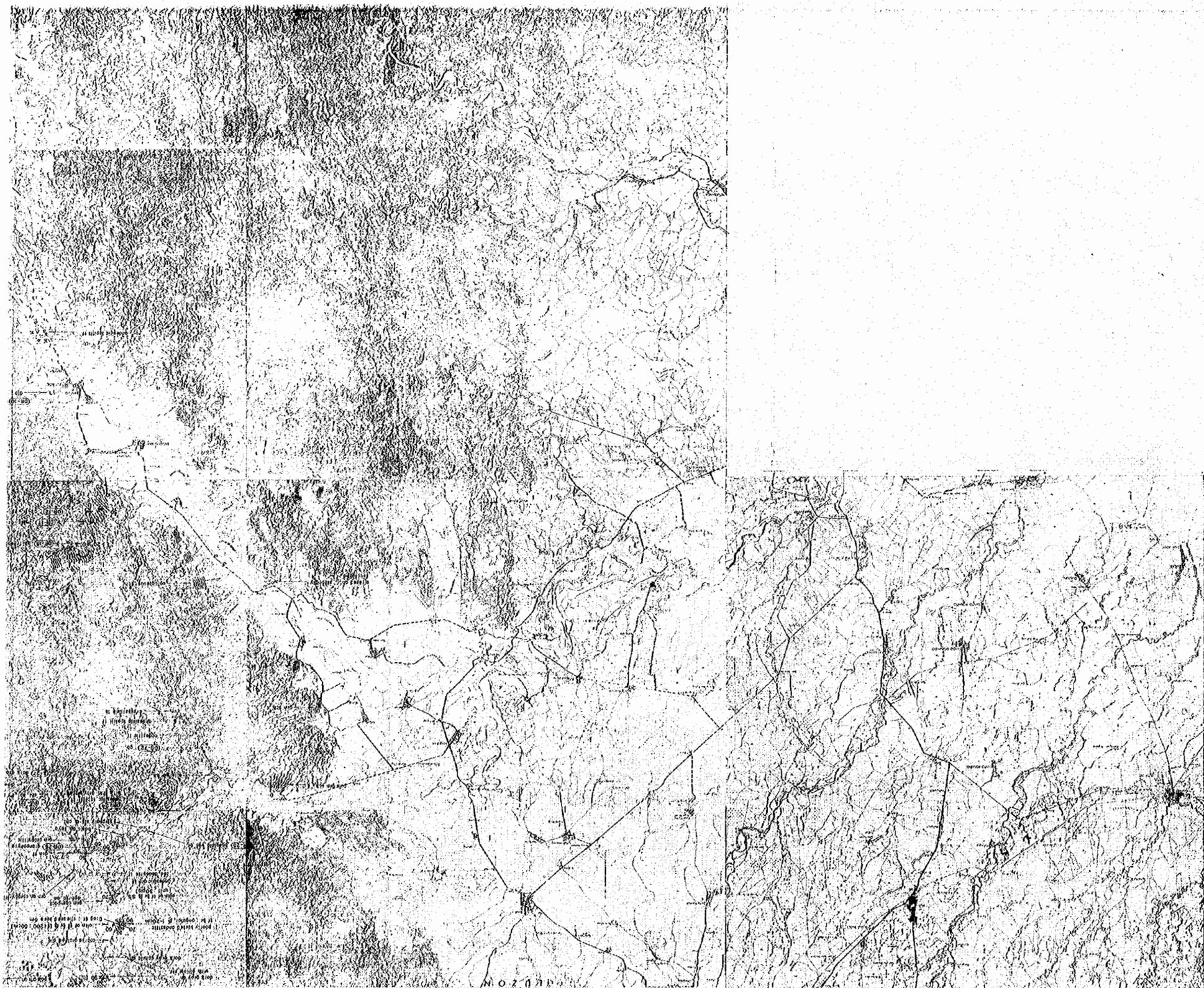
PHILIPPINE SEA

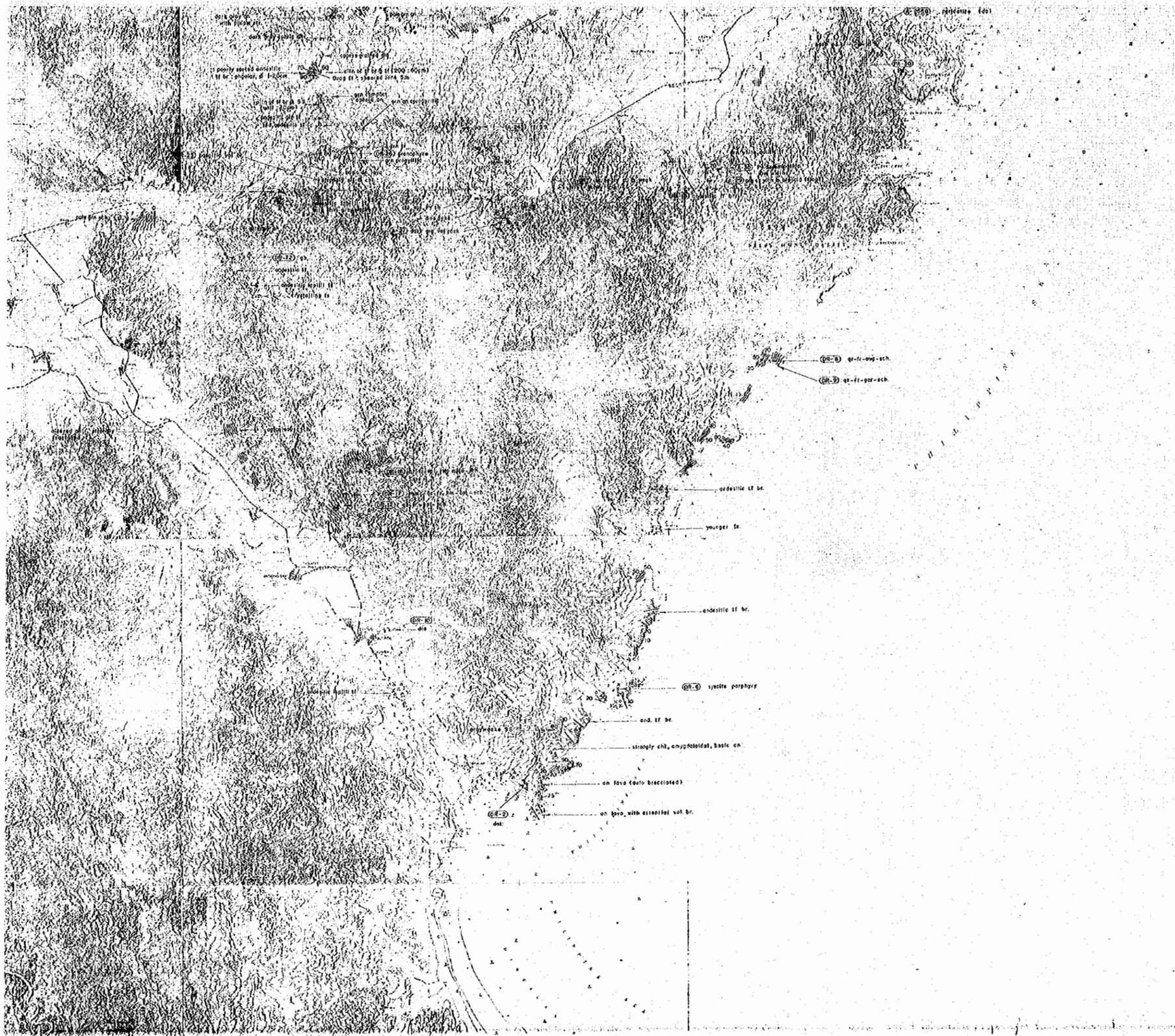
10° 00'  
 121° 30'





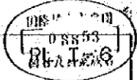






**LEGEND**

	Siltstone (silt)		Dolerite (dol)
	Mudstone (ms), shale (sh)		Porphyrite (porph)
	Sandstone (ss)		Basalt (ba)
	Conglomerate (cgl)		Propylite (prop)
	Limestone (ls)		Andesite (an) auto brecciated
	Tuff (ff), tuff breccia (lf br)		Dacite (da)
	Schist (sch)		Rhyolite (rhy)
	Boritolite (pd) pyroxenite (pyr)		Bedding
	Gabbro (gb)		Synclinal & anticlinal axes
	Diorite (dlo)		Fault
	Monzonite (Mon)		Fossil
	Granite (Gra)		Sample No



GEOLOGICAL SURVEY  
OF  
NORTHEASTERN LUZON  
PHILIPPINES  
( PHASE I )

COLUMNAR SECTION  
OF  
LOCAL STRATIGRAPHY

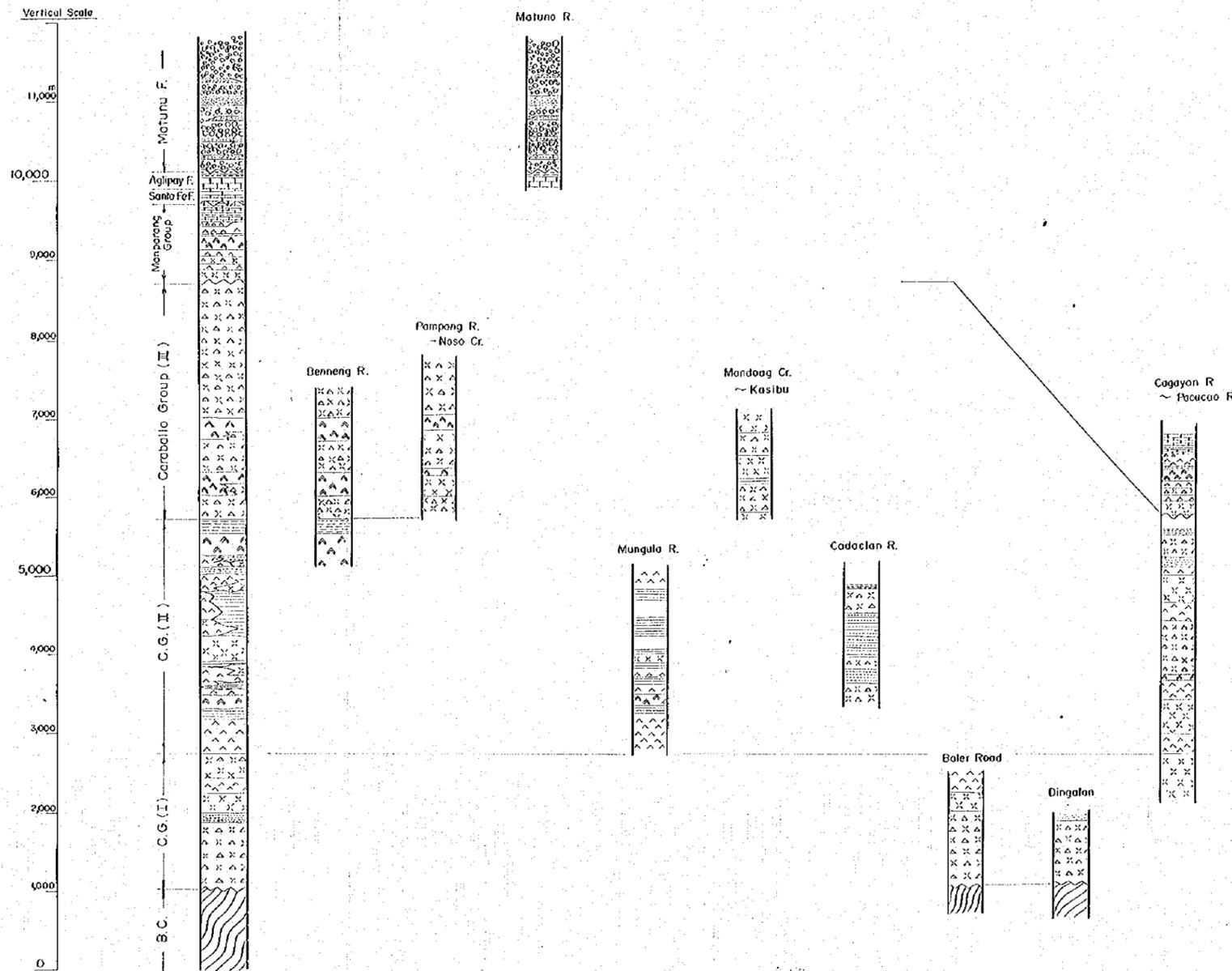
SCALE 1: 30,000



METAL MINING AGENCY OF JAPAN  
JAPAN INTERNATIONAL COOPERATION AGENCY  
GOVERNMENT OF JAPAN  
October 1975

Prepared by Bishimetal Exploration Co., Ltd.

Generalized Columnar Section

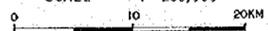


LEGEND

- Limestone
- Mudstone
- Sandstone
- Conglomerate
- Tuff
- Tuff breccia
- Volcanic breccia
- Andesite
- Basalt
- Schist
- No exposure



  
 GEOLOGICAL SURVEY  
 OF  
 NORTHEASTERN LUZON  
 PHILIPPINES  
 (PHASE I)  
  
**TECTONIC MAP**

SCALE 1:250,000  


METAL MINING AGENCY OF JAPAN  
 JAPAN INTERNATIONAL COOPERATION AGENCY  
 GOVERNMENT OF JAPAN  
 October 1975  
  
 Prepared by Bishmetal Exploration Co., Ltd.

**LEGEND**

 Younger F.	 Ultra basic rocks
 Coroballo G. III	 Dioritic rocks
 C.G. II	 Synclinal & anticlinal axes
 C.G. I	 Fault, thrust
 Basement complex	

 Strike line

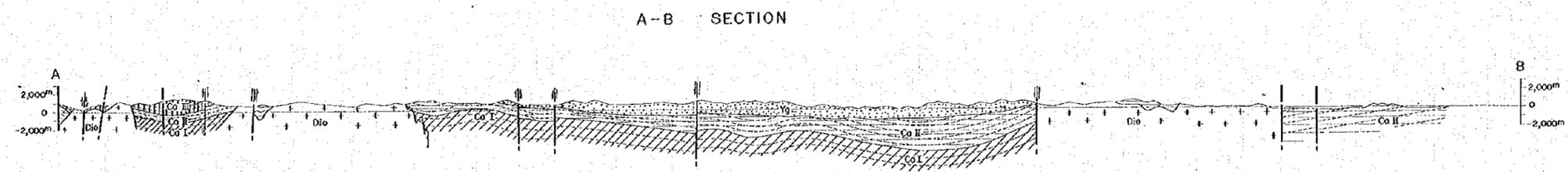
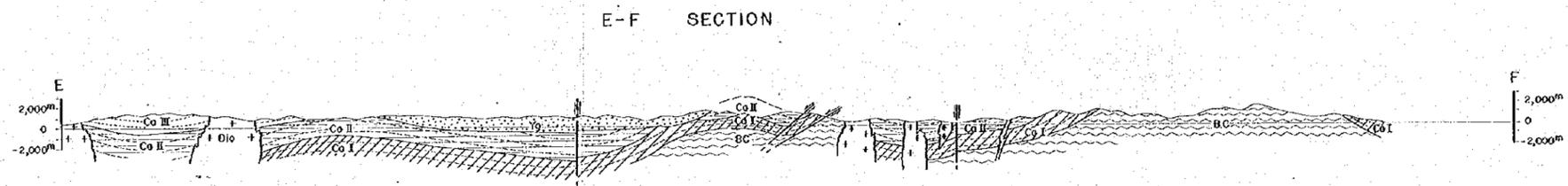
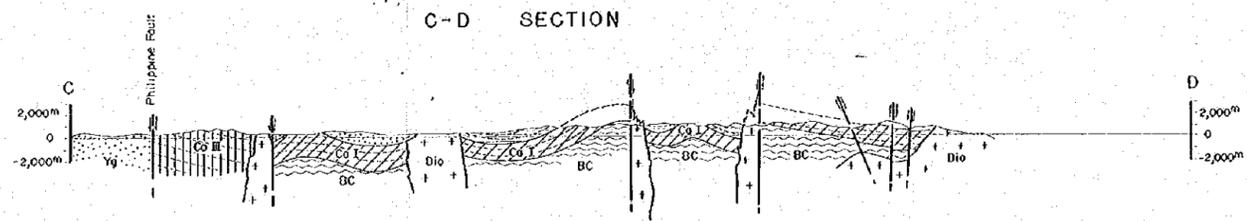
GEOLOGICAL SURVEY  
 OF  
 NORTHEASTERN LUZON  
 PHILIPPINES  
 (PHASE I)

TECTONIC PROFILE

SCALE 1 : 250,000  
 0 10 20KM

METAL MINING AGENCY OF JAPAN  
 JAPAN INTERNATIONAL COOPERATION AGENCY  
 GOVERNMENT OF JAPAN  
 October 1975

Prepared by Bisimetal Exploration Co., Ltd.



LEGEND

- |  |                  |  |           |
|--|------------------|--|-----------|
|  | Younger F.       |  | Ultra bas |
|  | Corobello G. III |  | Dioritic  |
|  | C. G. II         |  |           |
|  | C. G. I          |  |           |
|  | Basement Complex |  |           |

PLATE 53

GEOLOGICAL SURVEY  
OF  
NORTHEASTERN LUZON  
PHILIPPINES  
(PHASE I)

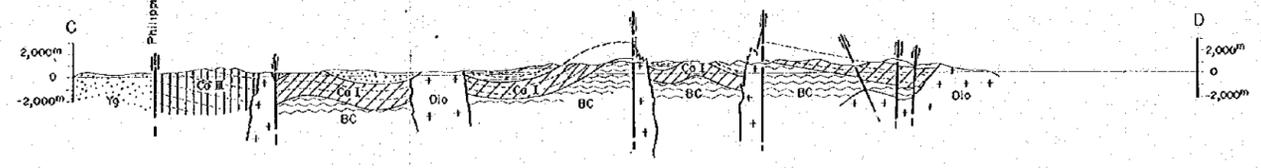
TECTONIC PROFILE

SCALE 1:250,000  
0 10 20 KM

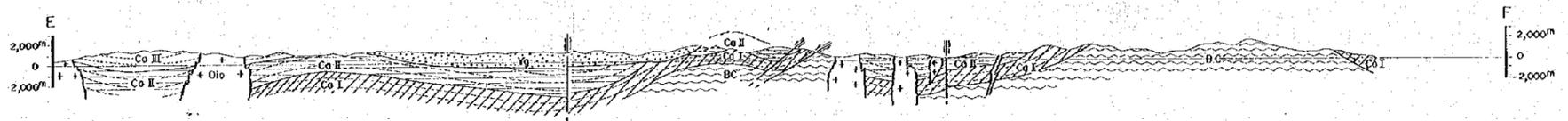
METAL MINING AGENCY OF JAPAN  
JAPAN INTERNATIONAL COOPERATION AGENCY  
GOVERNMENT OF JAPAN  
October 1975

Prepared by Bishmetol Exploration Co., Ltd.

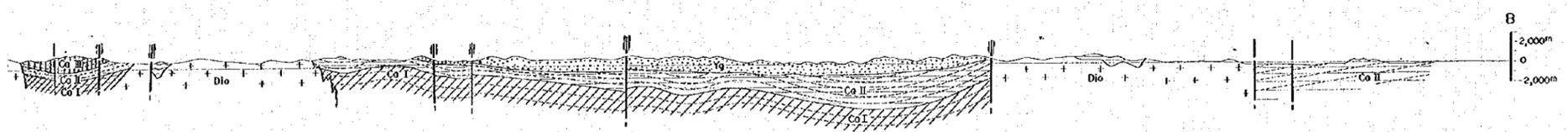
C-D SECTION



E-F SECTION

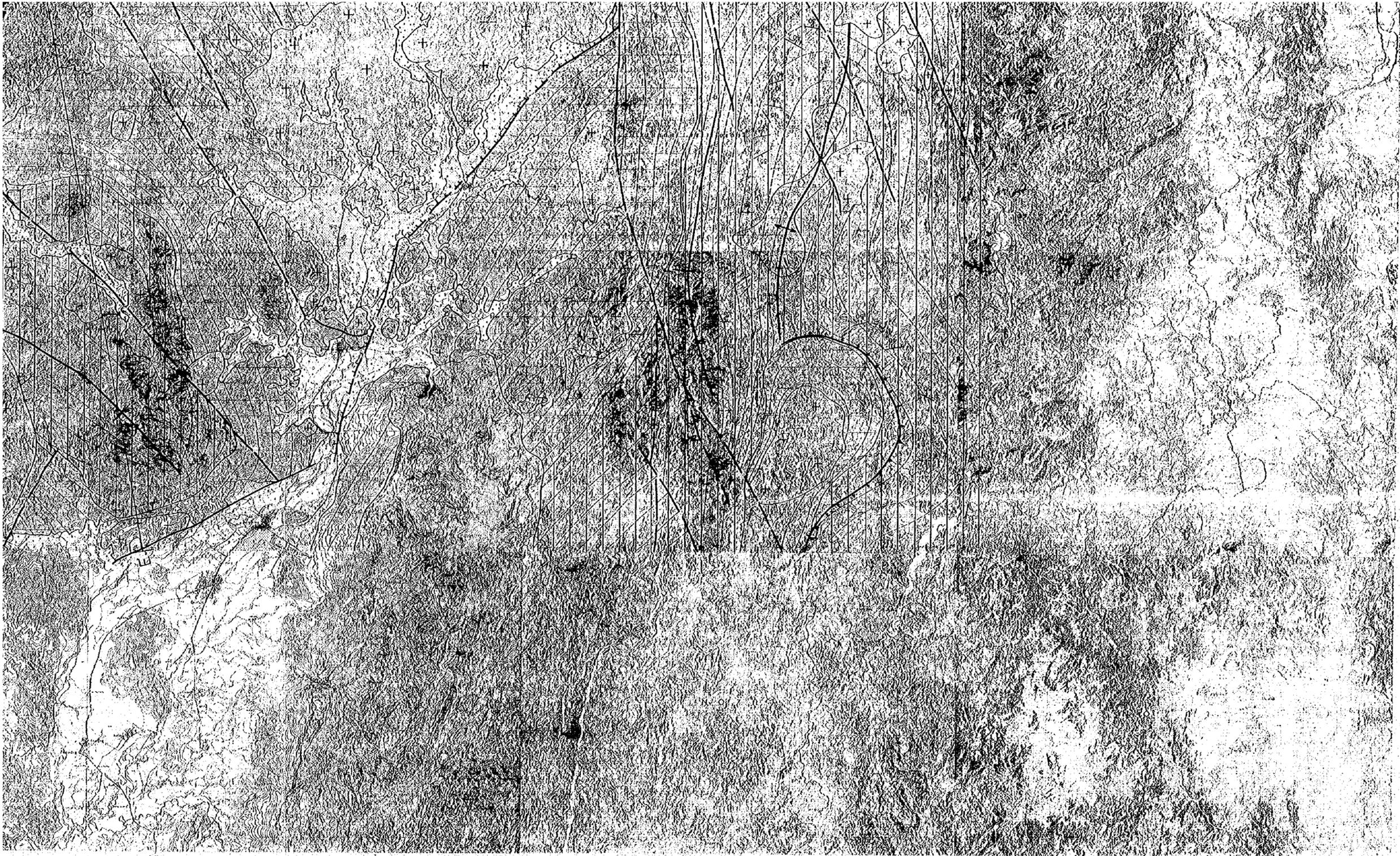


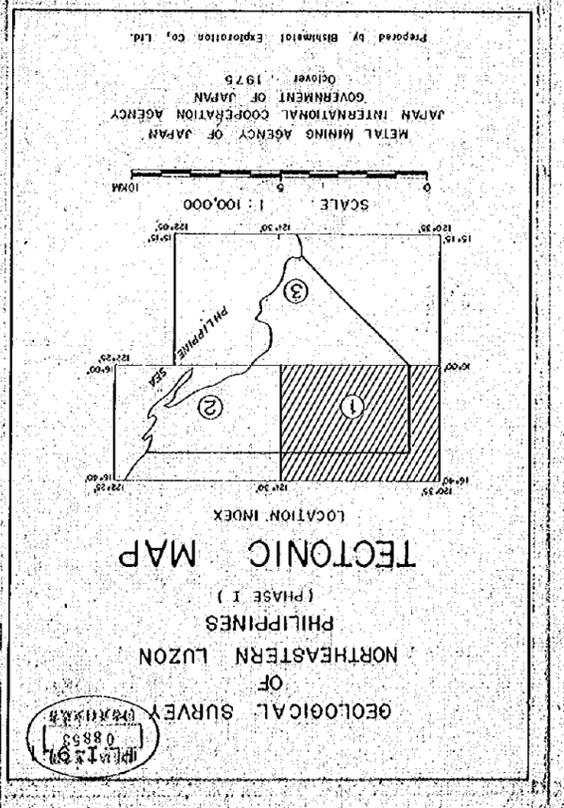
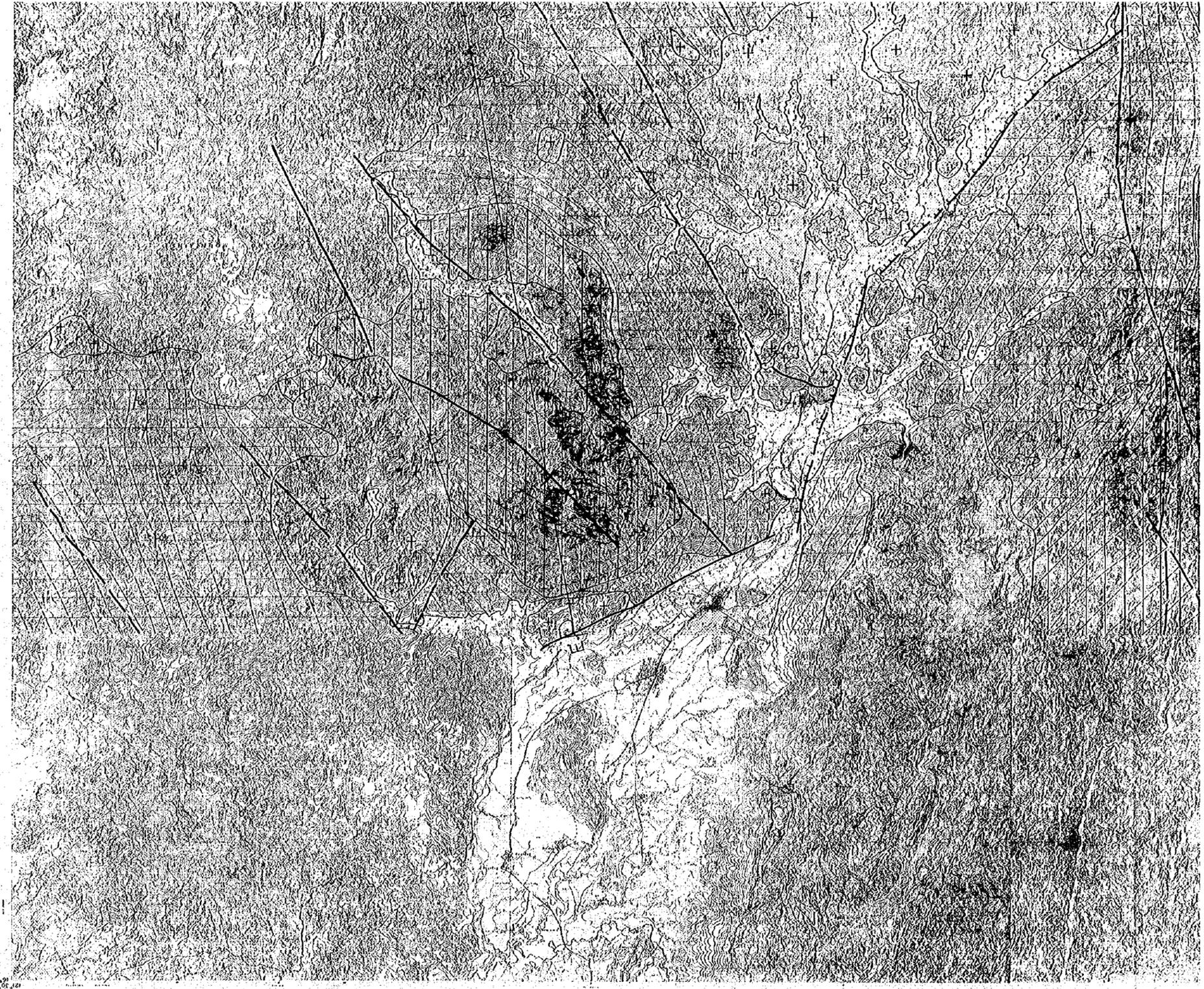
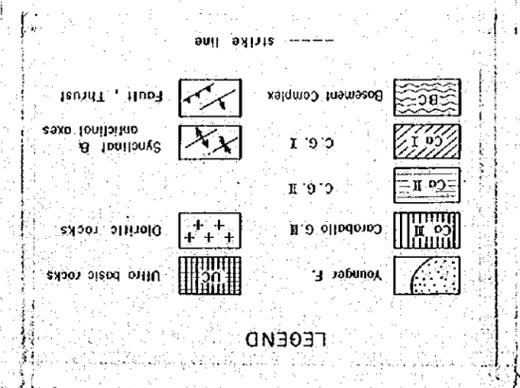
A-B SECTION

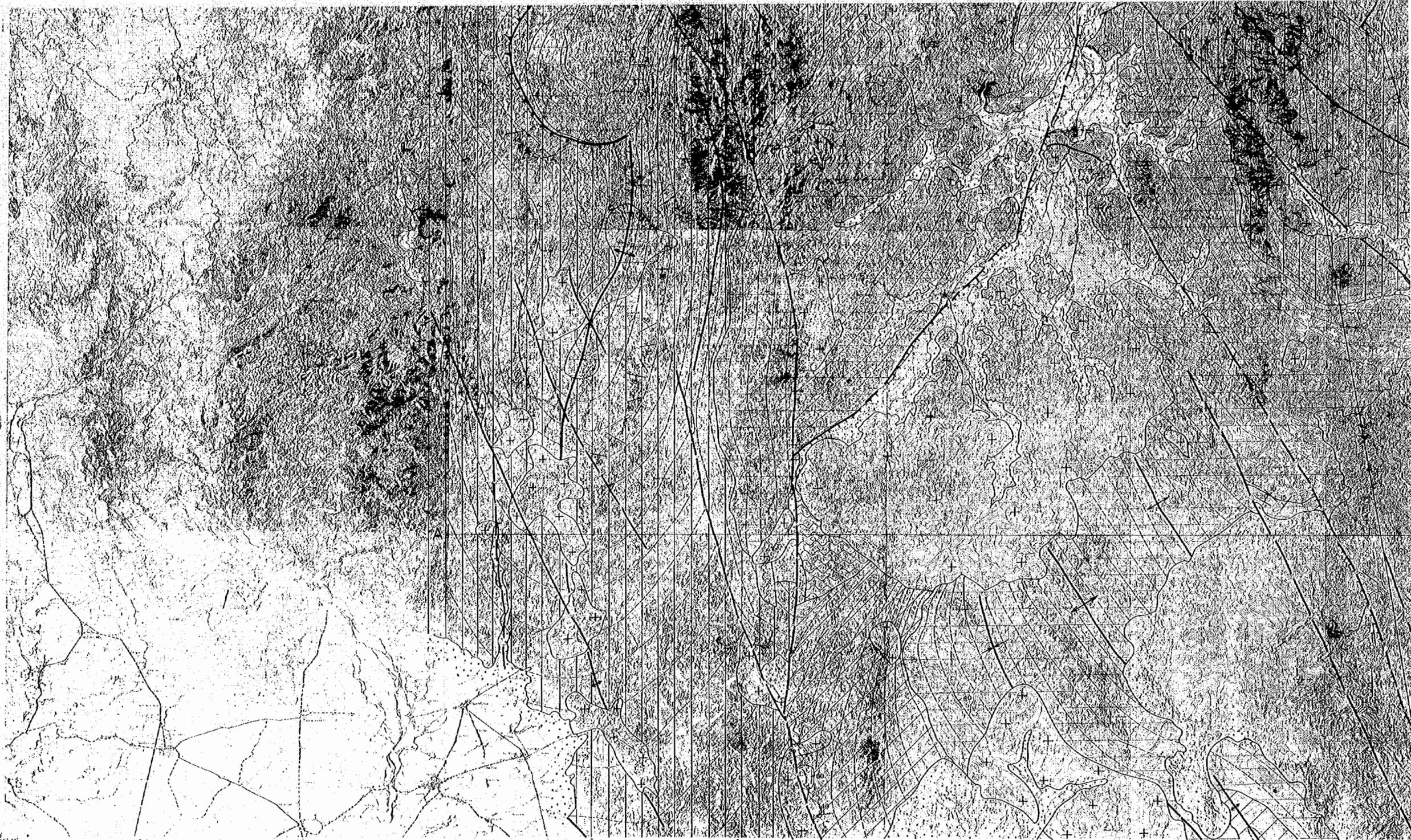


LEGEND

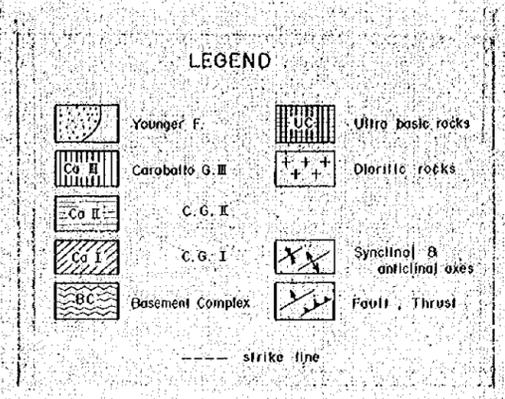
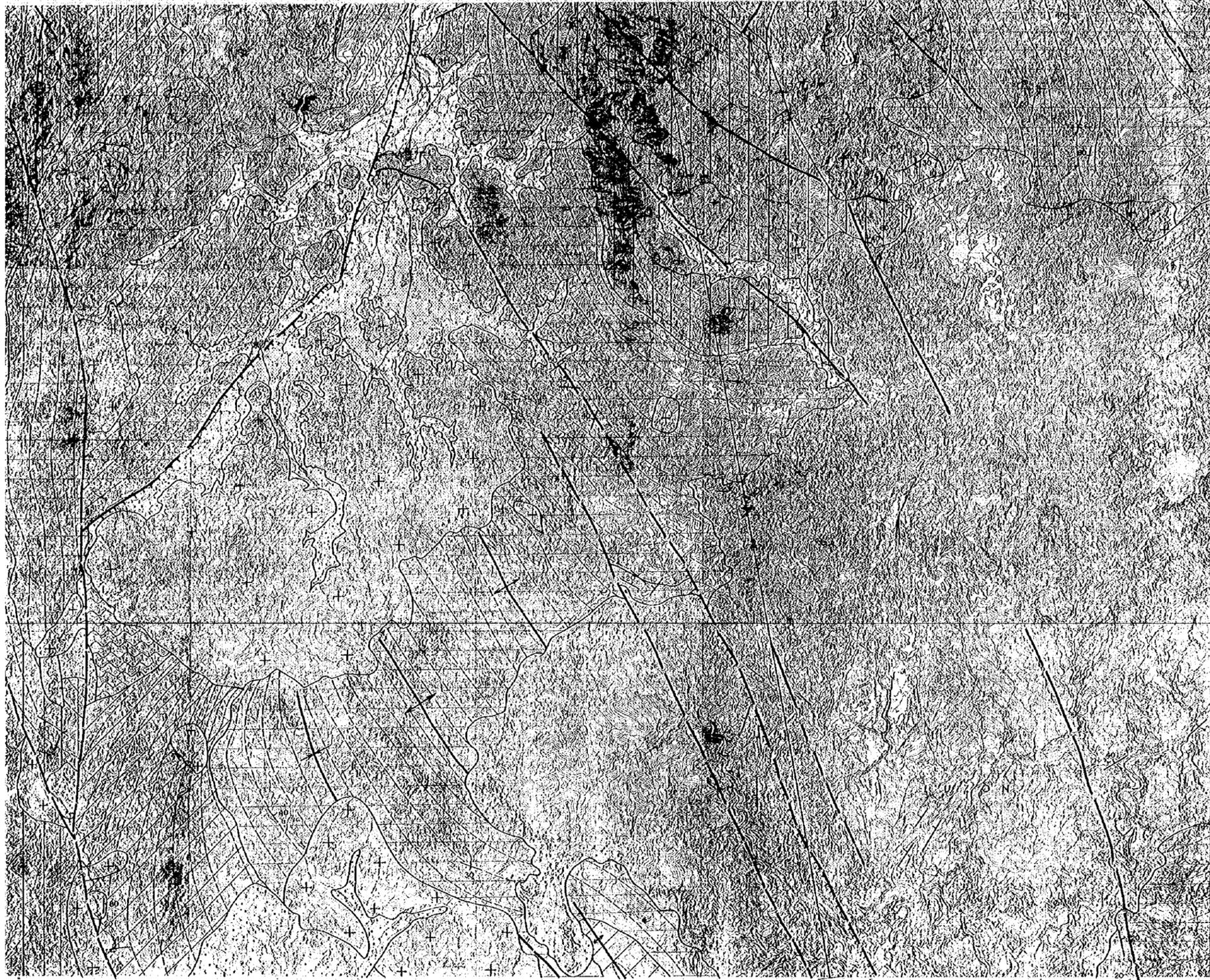
-  Younger F.
-  Corabolo G. II
-  Co II
-  Co I
-  Basement Complex
-  Ultra basic rocks
-  Dioritic rocks







16100  
1201 50



7.

24° 00'