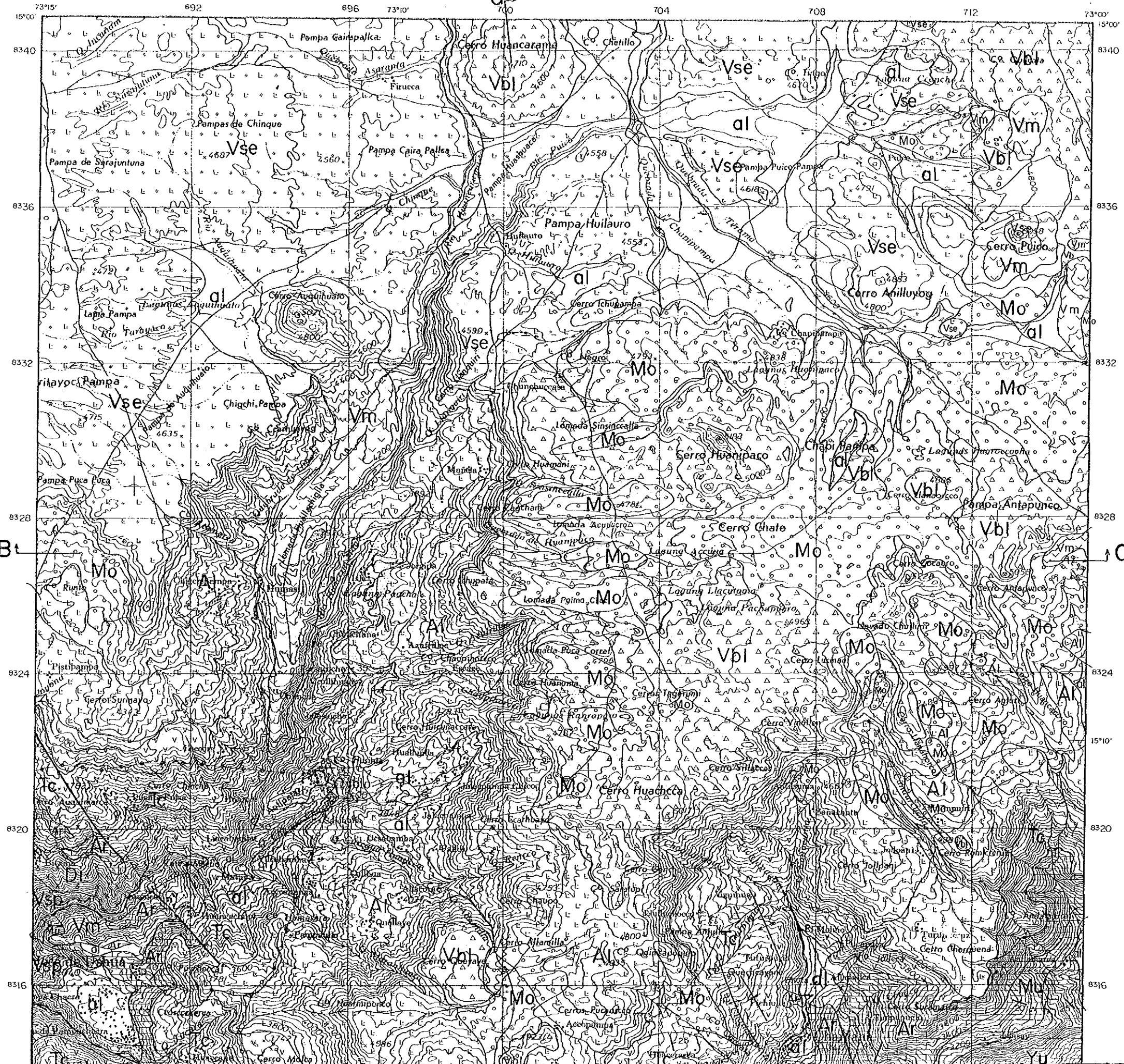


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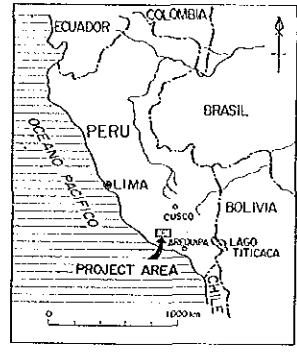
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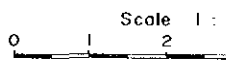


MINERAL EXP
IN
COTAHUASI
(PHASE

GEOLOGICAL THE REGIONAL (2

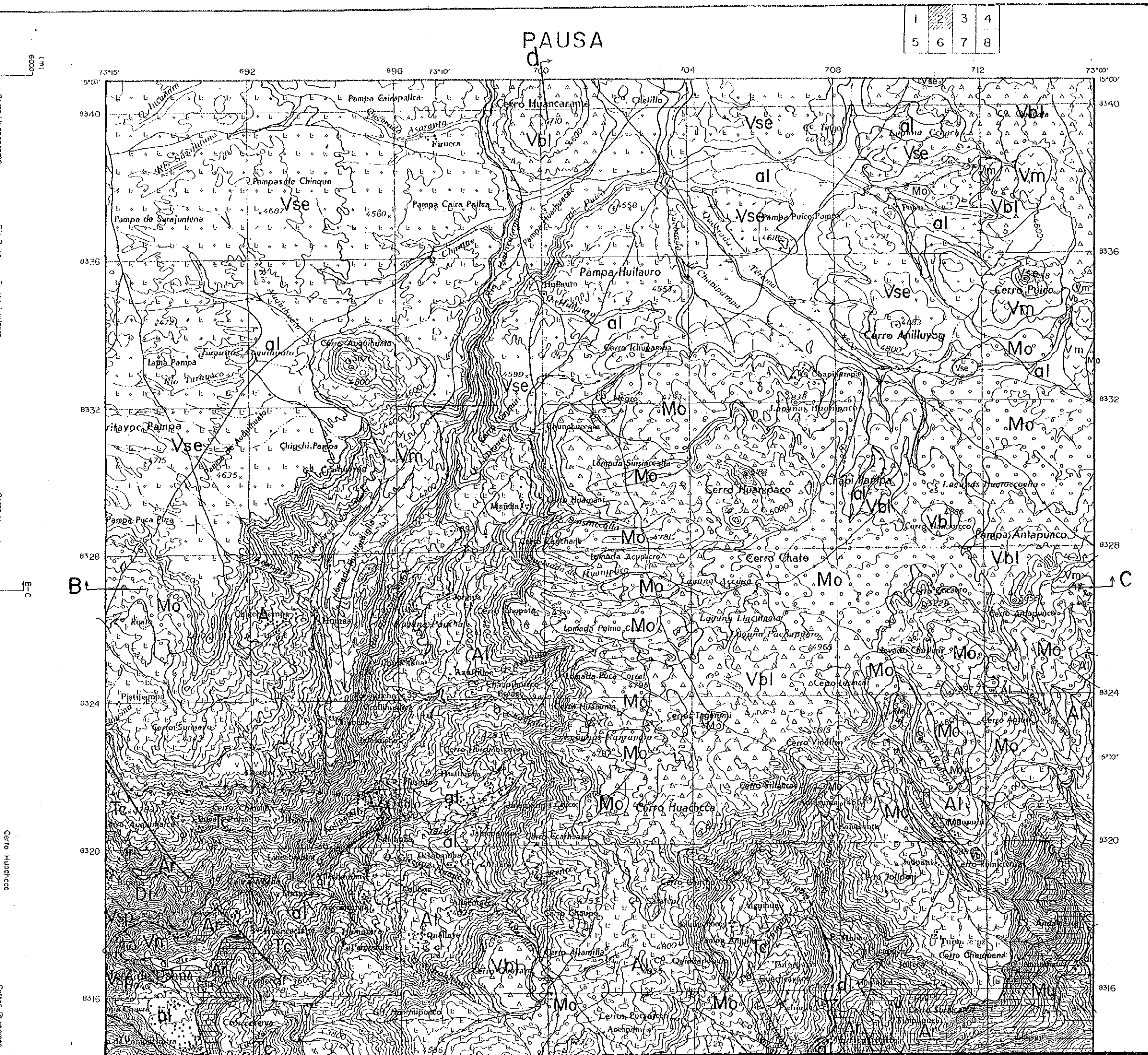


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METAL MINING AGENC
INSTITUTO GEOLOGICO MINE
February 1986



LEGEND

Quaternary	Quaternary	Alluvium	al	Sand
	Holocene	Mallebanaba	Vm	Andesi
		Volcanic Rocks	Vm	Andesi
		Volcanic Sediment of Pausa	oovsp	Volcan
	Pleistocene	Lampa	AVA	Andesi
		Volcanic Rocks	AVA	Andesi
	Pleistocene	Moraine Sediment	Mo	Grovel
		Boroso Group	Upper	Vbu
	Lower		vbi	Andesi
	Tertiary	Pliocene	Sencca	Vse
Volcanic Rocks			Vse	Hornbl welded
Miocene		Huayllitas Formation	HY	Dacitic
		Alpabamba Formation	AI	Dacitic and we (partly)
Oligocene		Tacaza Formation	TC	Andesit and dac
		Huancra Formation	HC	Andesit and tuf
Cretaceous		Arcarquina Formation	CA	Limestc and ch
		Murco Formation	MU	Red sh bearing
		Yura Group	YU	Quartzit and all
		Socosani Formation	SO	Black s
Jurassic	Chocolate volcanic rocks	CHO	Andesit tufface	
	Precambrian	Gneiss	GN	Gneiss
Tertiary		Intrusive Rocks	Vv	Hornbl
	Stock and Dyke	VA	Hornbl	



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PL. 3-(2)

MINERAL EXPLORATION
IN
COTAHUASI AREA
(PHASE I)

GEOLOGICAL MAP OF THE REGIONAL SURVEY AREA (2)

(15147)

LOCATION INDEX

JAPAN INTERNATIONAL COOPERATION AGENCY
METAL MINING AGENCY OF JAPAN
INSTITUTO GEOLOGICO MINERO Y METALURGICO
February 1986

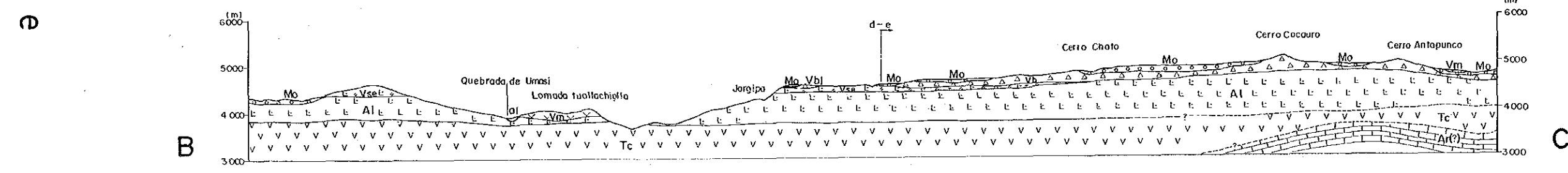
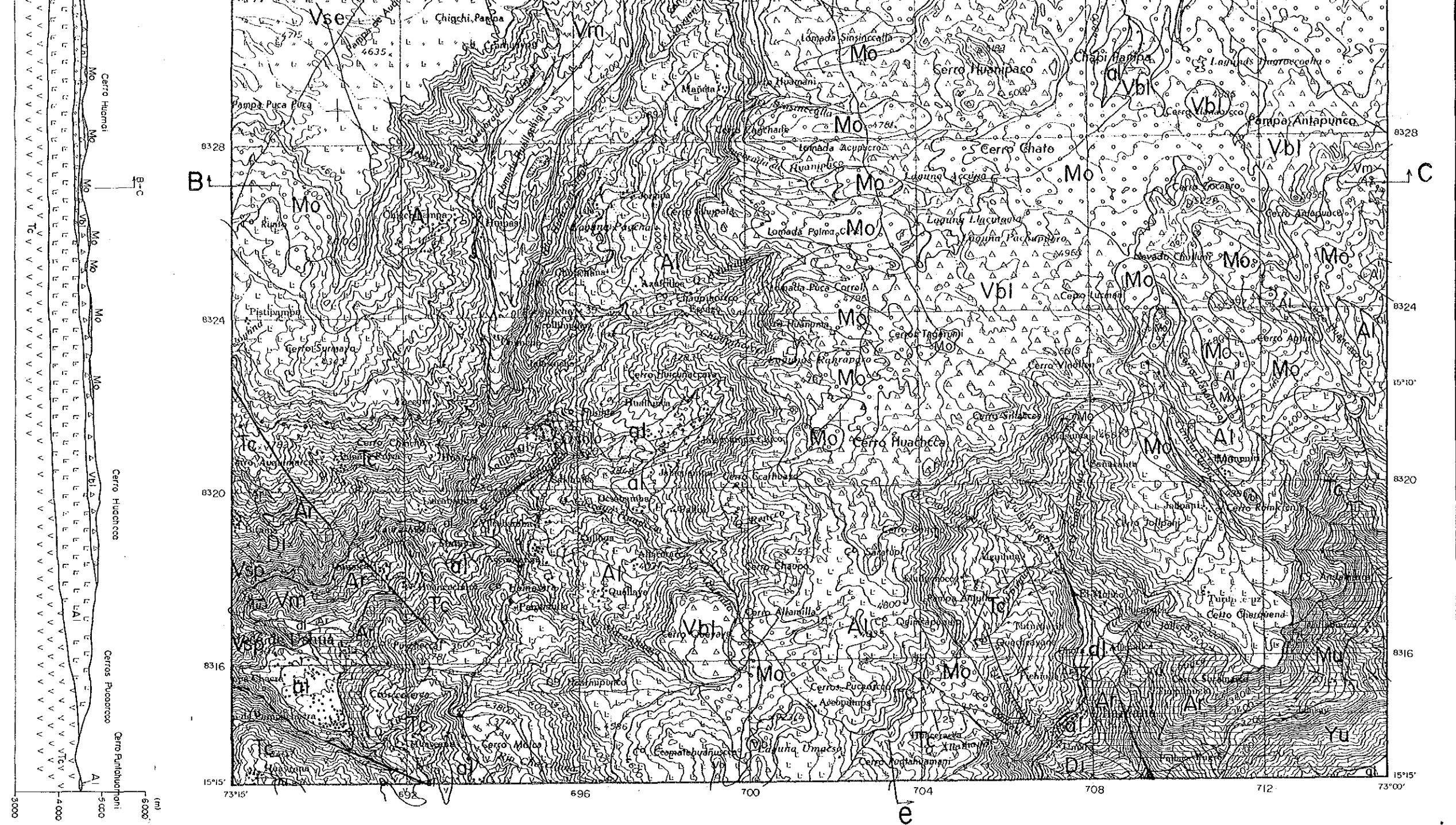
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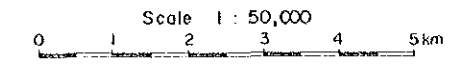
LEGEND

Cenozoic	Quaternary	Alluvium	al	Sand, mud and gravel	
		Mollebamba Volcanic Rocks	vvm	Andesite lava and volcanic ash	
		Volcanic Sediment of Pausa	vse	Volcanic ash, sand and gravel	
	Pleistocene	Barroso Group	Upper	vbu	Acidic tuff
			Lower	vbl	Andesite lava and pyroclastic rocks
		Sencca Volcanic Rocks	vse	Hornblende-biotite dacite lava, welded tuff and tuff	
	Tertiary	Pliocene	Huayllillas Formation	hy	Dacitic tuff (partly pumice bearing)
			Alpabamba Formation	ai	Dacitic tuff, lapilli tuff, tuff breccia and welded tuff (partly with dacite lava or andesite lava)
			Tacaza Formation	tc	Andesitic tuff breccia, Andesite, tuff and dacitic tuff breccia (greenish grey)
		Pliocene - Quaternary	Huanca Formation	hc	Andesitic volcanic conglomerate, tuff breccia and tuffaceous sandstone (greenish grey)
Arcaquina Formation			ar	Limestone and marl with sandstone and chert nodule	
Mesozoic	Cretaceous	Murco Formation	mu	Red shale and sandstone with gypsum bearing conglomerate	
		Yura Group	yu	Quartzite, siliceous sandstone, black shale and alternation of quartzite and shale	
	Jurassic	Socosani Formation	so	Black shale, limestone with sandstone and tuff	
		Chocolate volcanic rocks	cho	Andesitic tuff breccia, tuff, andesite and tuffaceous sandstone	
Precambrian	Gneiss	gn	Gneiss, gneissose granite and diorite		
Intrusive Rocks		Stock and Dyke	sd	Hornblende andesite, andesite	

LEGEND

Cenozoic	Quaternary	Holocene	Alluvium (al)	Sand
		Mollebamba Volcanic Rocks (Vm)	Andes	
		Volcanic Sediment of Pausa (Vsp)	Volcanic	
		Lampa Volcanic Rocks (Vla)	Andes	
	Pleistocene	Moraine Sediment (Mo)	Gravel	
		Barroso Group	Upper (Vbu)	Acidic
			Lower (Vbl)	Andes
		Pliocene	Sencca Volcanic Rocks (Vse)	Hornbl. welded
	Ihuayllillas Formation (IHy)		Dacitic	
	Tertiary	Alpabamba Formation (Al)	Dacitic and we. (partly)	
Tocazo Formation (Tc)		Andes and dac.		
Mesozoic	Paleogene	Huanca Formation (VHc)	Andes and tu.	
		Arcurquina Formation (Ar)	Limest. and c.	
		Murco Formation (Mu)	Red sh. bearing	
	Jurassic	Yura Group (Yu)	Quartz. and al.	
		Socosani Formation (So)	Black	
		Chocolate volcanic rocks (Cho)	Andes. tuffaceous	
Precambrian		Gneiss (Gn)		
Tertiary	Intrusive Rocks	Stock and Dyke (VvAn)	Hornbl.	
		Accha Stock (VvDi)	Diorite	
	Cretaceous	La Costa Batholith (VvCa)	Quartz.	

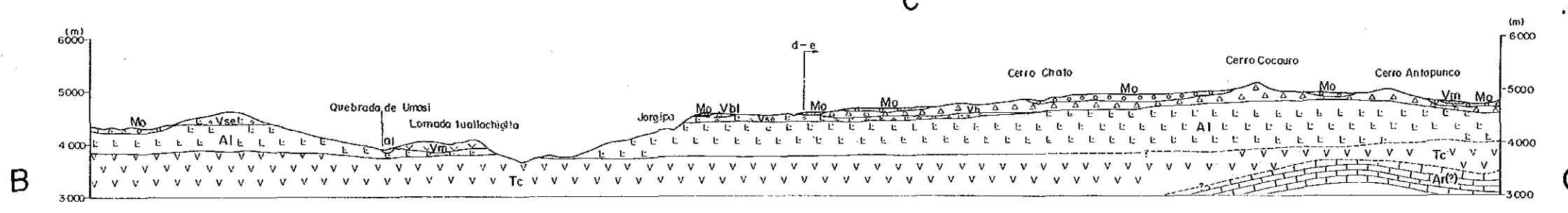
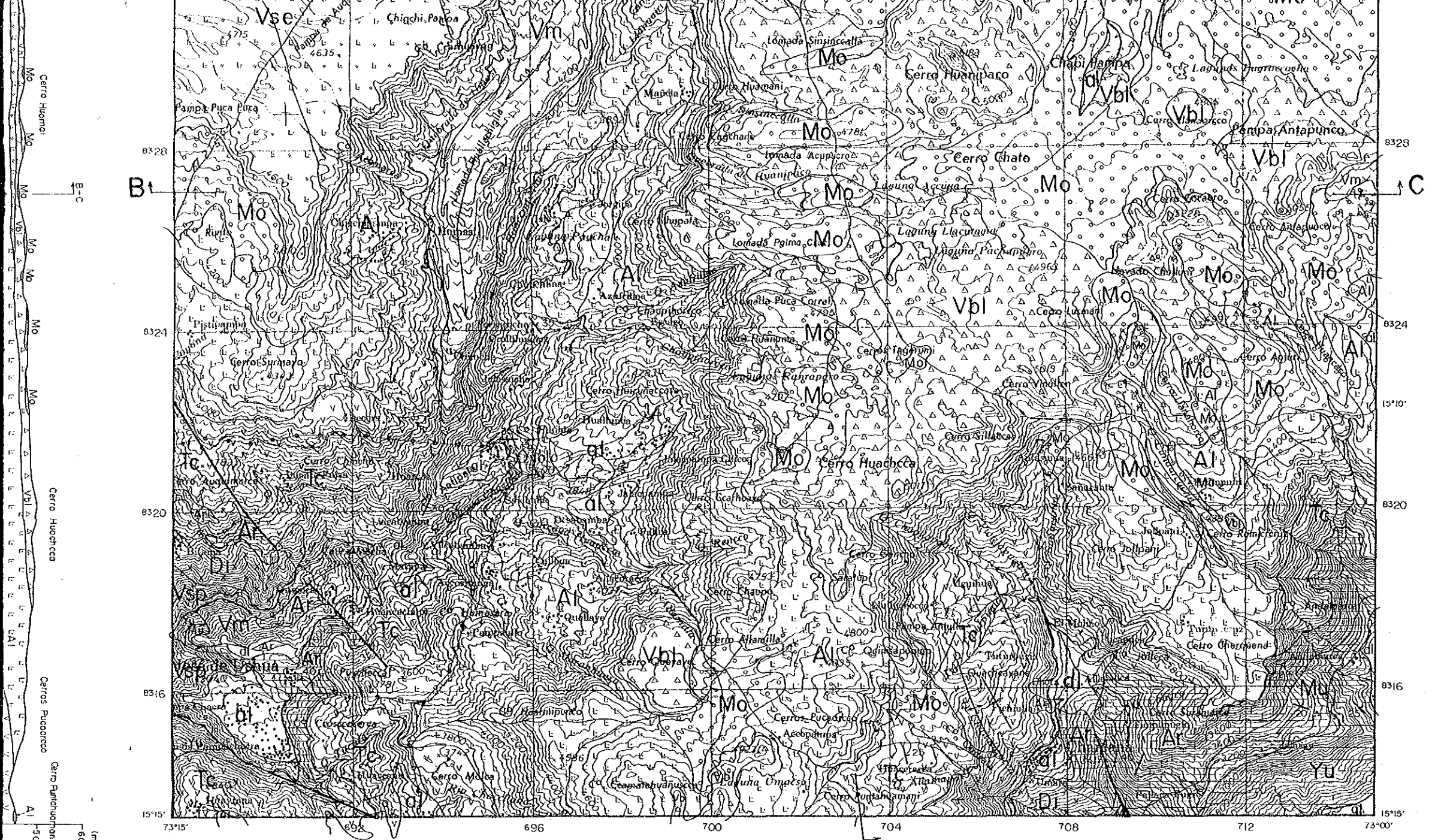


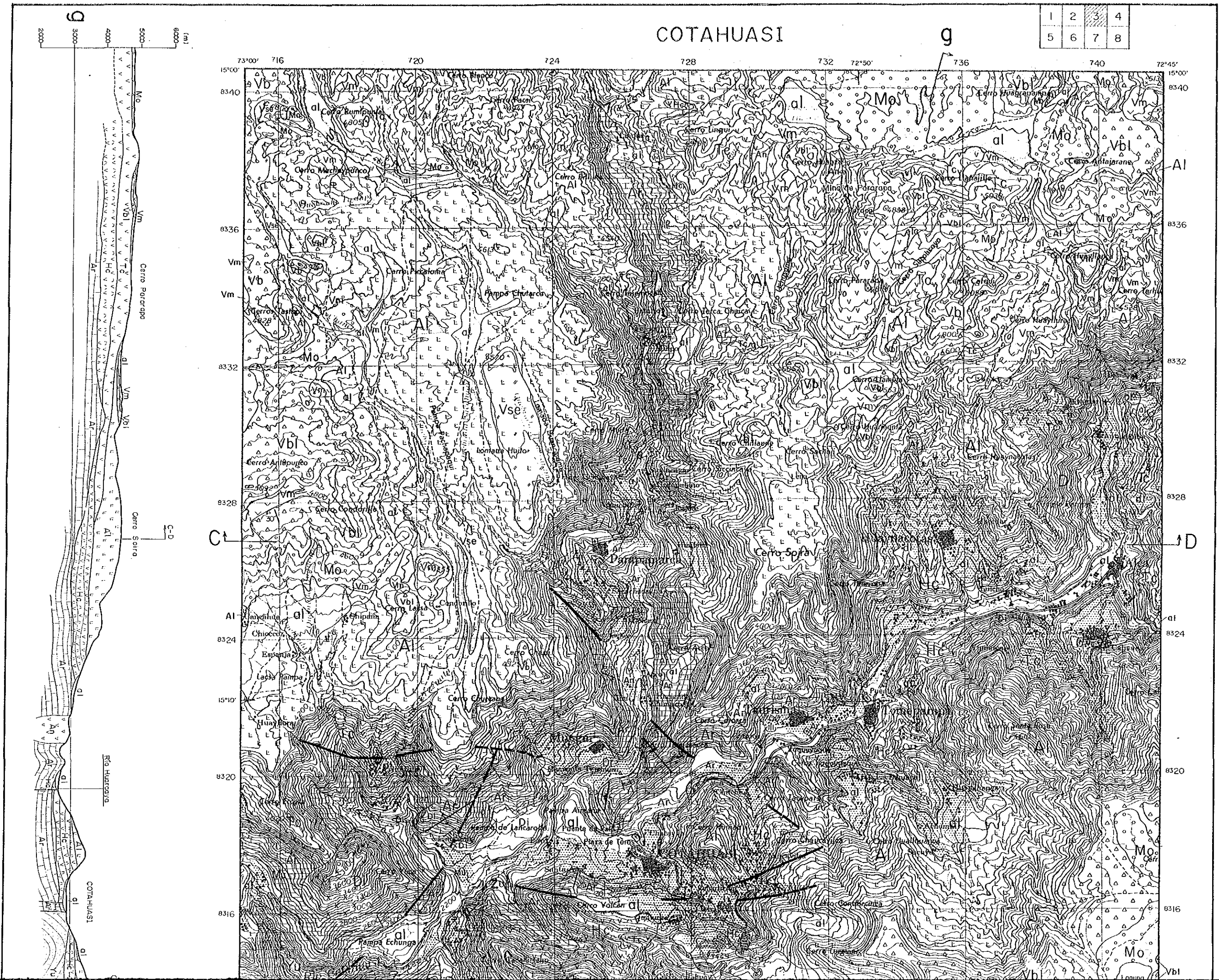


LEGEND

Cenozoic	Quaternary	Alluvium	ai	Sand, mud and gravel	
		Mollebamba Volcanic Rocks	Vm	Andesite lava and volcanic ash	
		Volcanic Sediment of Pausa	o.vsp	Volcanic ash, sand and gravel	
		Lampa Volcanic Rocks	AVIa	Andesite (basaltic), volcanic breccia	
	Pleistocene	Moraine Sediment	Mo	Gravel, sand and mud	
		Barroso Group	Upper	Vbu	Acidic tuff
	Lower		AVb	Andesite lava and pyroclastic rocks	
	Tertiary	Pliocene	Seneca Volcanic Rocks	Vse	Hornblende-biotite dacite lava, welded tuff and tuff
			Huayllillas Formation	Hy	Dacitic tuff (partly pumice bearing)
		Alpabamba Formation	Alpabamba	Al	Dacitic tuff, lapilli tuff, tuff breccia and welded tuff (partly with dacite lava or andesite lava)
Tacaza Formation			Tc	Andesitic tuff breccia, Andesite, tuff and dacitic tuff breccia (greenish grey)	
Huanca Formation		Hc	Andesitic volcanic conglomerate, tuff breccia and tuffaceous sandstone (greenish grey)		
Mesozoic	Cretaceous	Arcurquina Formation	Ar	Limestone and marl with sandstone and chert nodule	
		Murco Formation	Mu	Red shale and sandstone with gypsum bearing conglomerate	
		Yura Group	Yu	Quartzite, siliceous sandstone, black shale and alternation of quartzite and shale	
	Jurassic	Socosani Formation	So	Black shale, limestone with sandstone and tuff	
		Chocolate volcanic rocks	Ch	Andesitic tuff breccia, tuff, andesite and tuffaceous sandstone	
		Precambrian	Gn	Gneiss, gneissose granite and diorite	
Tertiary	Intrusive Rocks	Stock and Dyke	AD	Hornblende andesite, andesite	
		Accha Stock	AD	Diorite and quartz diorite	
	Cretaceous	La Costa Batholith	CB	Quartz diorite and granodiorite	

- Fault
- Inferred fault
- Anticline
- Syncline
- Geological boundary
- Geological profile line
- Strike and dip of bedding
- Strike and dip of foliation
- Strike and dip of flow structure
- Mine (working or closed)
- Hot spring



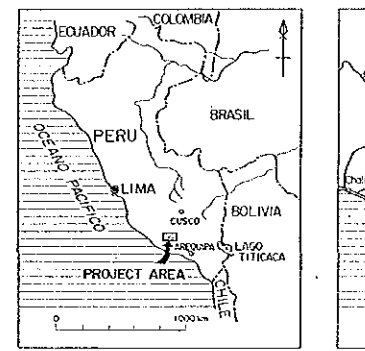


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MINERAL EXPLORATION
IN
COTAHUASI AREA
(PHASE I)

GEOLOGICAL MAP OF THE REGIONAL SHEET (3)

LOCATION INDEX



JAPAN INTERNATIONAL COOPERATION
METAL MINING AGENCY OF JAPAN
INSTITUTO GEOLOGICO MINERO
February 1986

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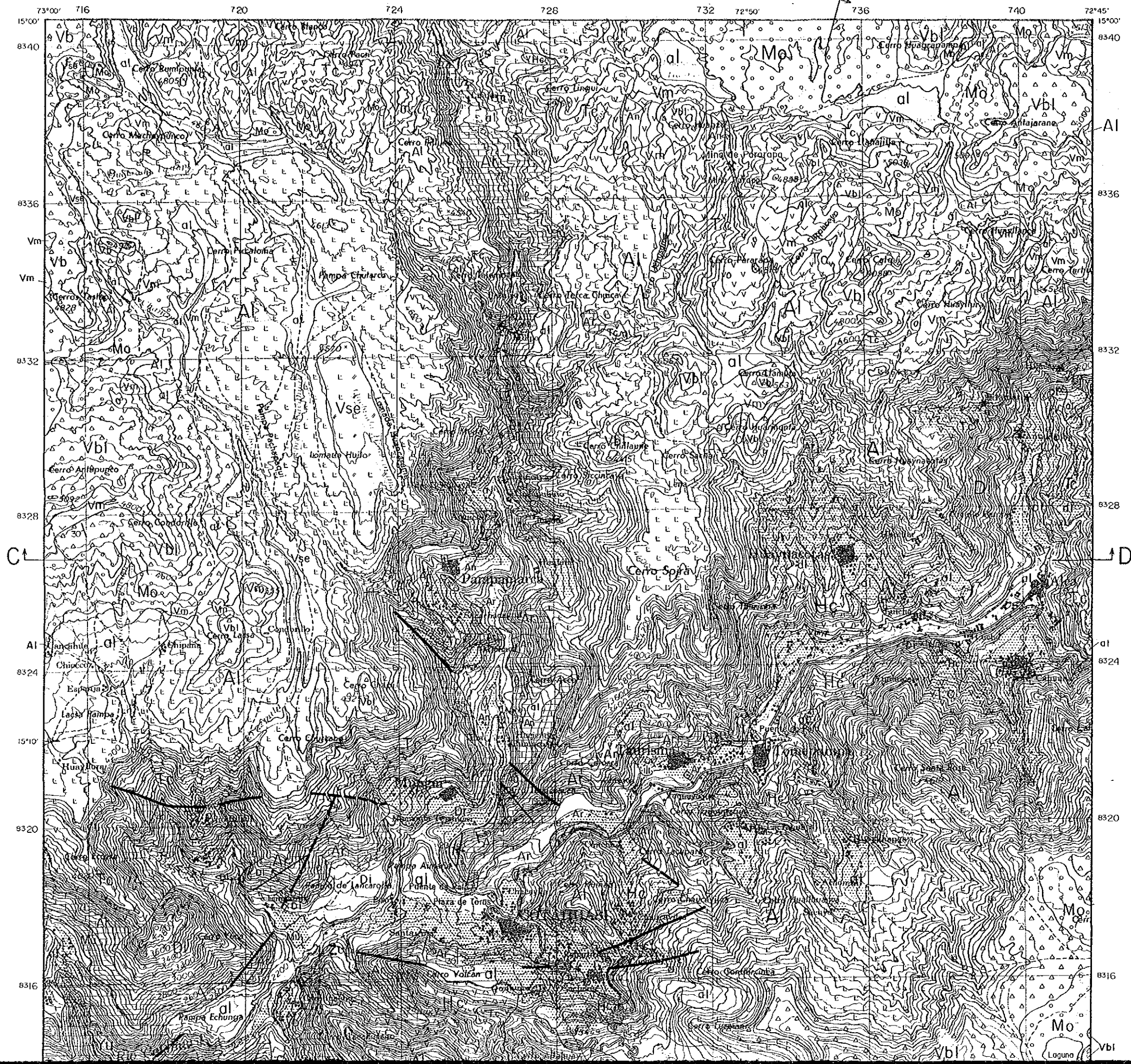
LEGEND

Cenozoic	Quaternary	Alluvium	al	Sand, mud	
		Mollebamba Volcanic Rocks	Vm	Andesite	
		Volcanic Sediment of Pausa	o-o-vsp	Volcanic	
	Pliocene	Lampa Volcanic Rocks	A-A-Vio	Andesite	
		Moraine Sediment	o-o-Mo	Gravel, sc	
	Barroso Group	Upper	Vbu	Acidic tu	
		Lower	Vbl	Andesite	
	Tertiary	Pliocene	Senco Volcanic Rocks	L-Vse	Hornblende welded tu
			Huayllillas Formation	Hy	Dacitic tu
		Miocene	Alpabamba Formation	L-Al	Dacitic tu and welded (partly with)
Tacozo Formation			V-V-Tc	Andesitic tu and dacitic	
Huanca Formation			V-V-Hc	Andesitic tu and tuffaceous	
Mesozoic	Cretaceous	Arcuquina Formation	A-A-Ca	Limestone and chert	
		Murco Formation	Mu	Red shale bearing co	
	Jurassic	Yura Group	Yu	Quartzite, and altern	
		Socosani Formation	So	Black shal	
		Chocolate volcanic rocks	Ch	Andesitic tuffaceous	
Precambrian		Gn	Gneiss, gn		
Intrusive Rocks					
Stock and Dyke		V-V-An		Hornblende	

COTAHUASI

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PL. 3-(3)

MINERAL EXPLORATION
IN
COTAHUASI AREA
(PHASE I)

GEOLOGICAL MAP OF THE REGIONAL SURVEY AREA (3)

(3) 国際協力事業団
15147
図書資料室蔵書

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JAPAN INTERNATIONAL COOPERATION AGENCY
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INSTITUTO GEOLOGICO MINERO Y METALURGICO
February 1986

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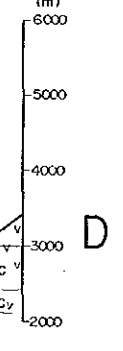
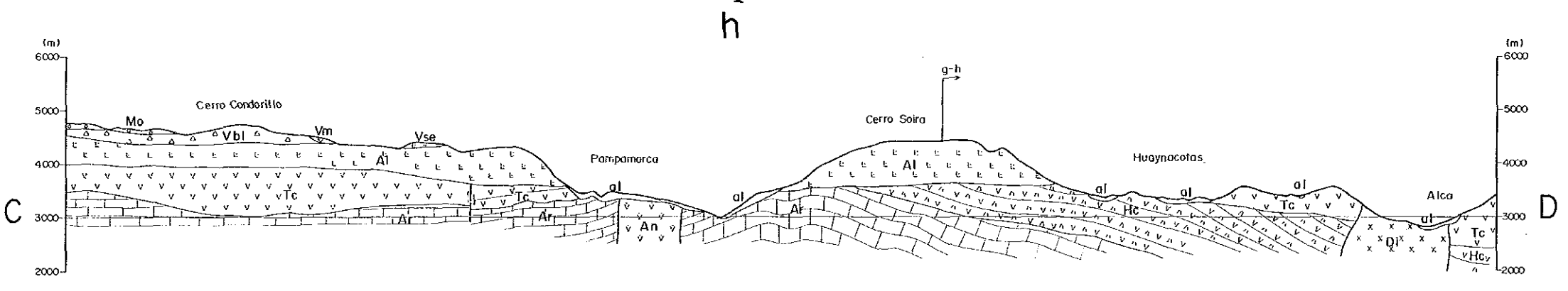
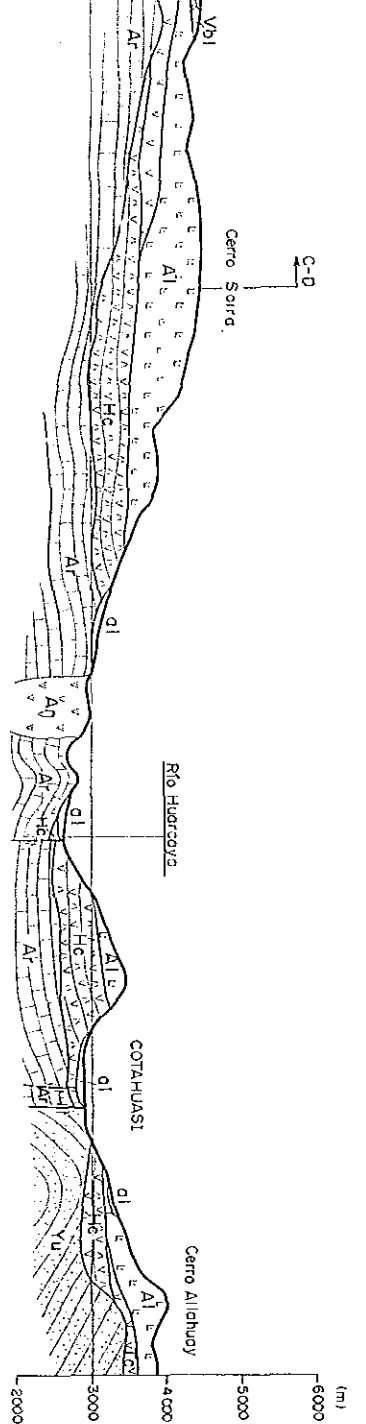
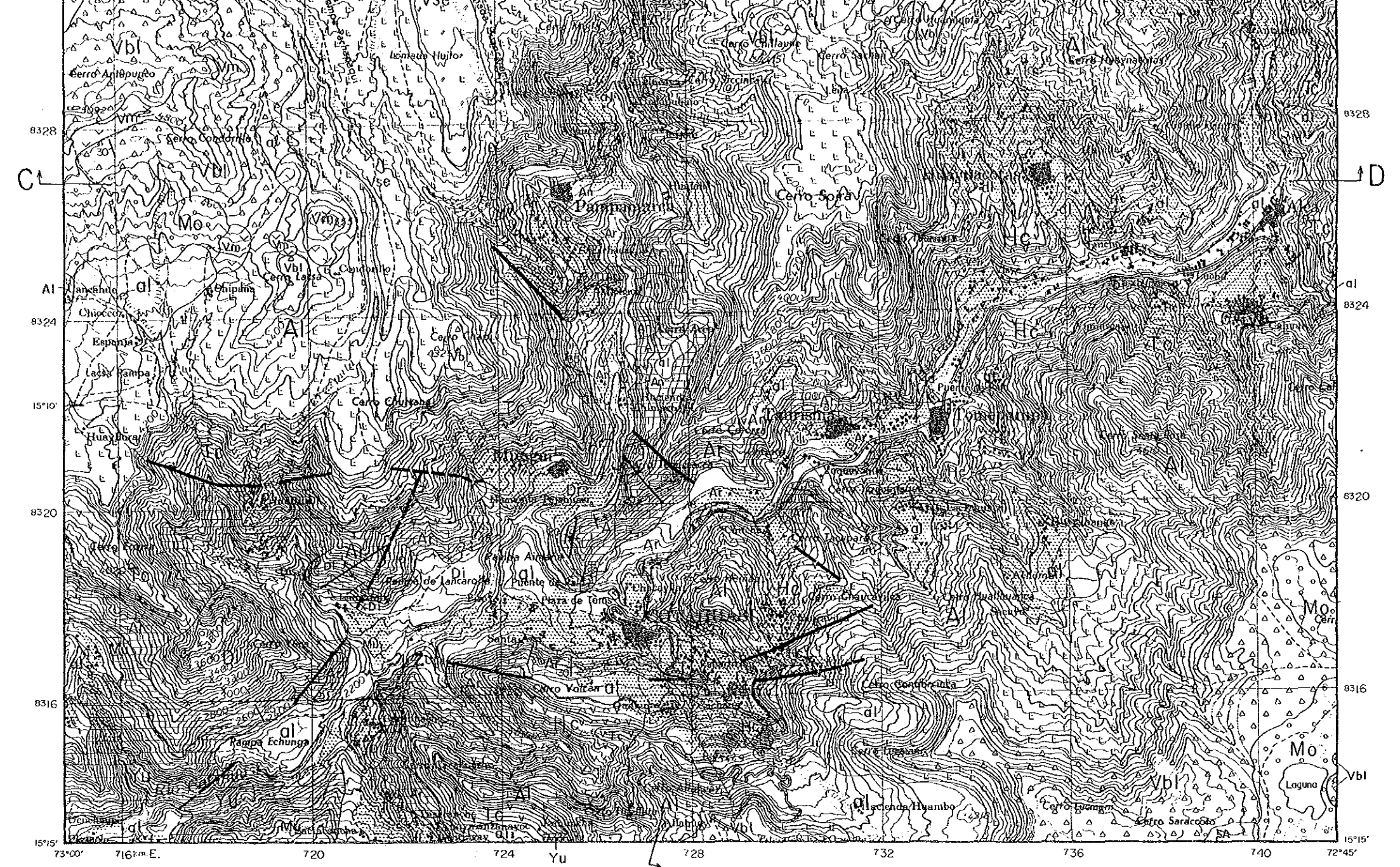
Cenozoic	Quaternary	Alluvium	al	Sand, mud and gravel	
		Mollebamba Volcanic Rocks	Vm	Andesite lava and volcanic ash	
		Volcanic Sediment of Pausa	Vsp	Volcanic ash, sand and gravel	
		Lampa Volcanic Rocks	Vl	Andesite (basaltic), volcanic breccia	
	Pleistocene	Moraine Sediment	Mo	Gravel, sand and mud	
		Barroso Group	Upper	Vbu	Acidic tuff
			Lower	Vbl	Andesite lava and pyroclastic rocks
		Pliocene	Sencca Volcanic Rocks	Vse	Hornblende-biotite dacite lava, welded tuff and tuff
	Huayllillas Formation		Vhy	Dacitic tuff (partly pumice bearing)	
	Tertiary	Miocene	Alpabamba Formation	Vai	Dacitic tuff, lapilli tuff, tuff breccia and welded tuff (partly with dacite lava or andesite lava)
Tacaza Formation			Vtc	Andesitic tuff breccia, Andesite, tuff and dacitic tuff breccia (greenish grey)	
Oligocene		Huonca Formation	Vhc	Andesitic volcanic conglomerate, tuff breccia and tuffaceous sandstone (greenish grey)	
		Arcurquina Formation	Vat	Limestone and marl with sandstone and chert nodule	
Mesozoic	Cretaceous	Murco Formation	Vmu	Red shale and sandstone with gypsum bearing conglomerate	
		Yuro Group	Vyu	Quartzite, siliceous sandstone, black shale and alternation of quartzite and shale	
	Jurassic	Socsoni Formation	Vso	Black shale, limestone with sandstone and tuff	
		Chocolate volcanic rocks	Vcho	Andesitic tuff breccia, tuff, andesite and tuffaceous sandstone	
Precambrian		Vgn	Gneiss, gneissose granite and diorite		
Intrusive Rocks	Tertiary	Stock and Dyke	Vv	Hornblende andesite, andesite	

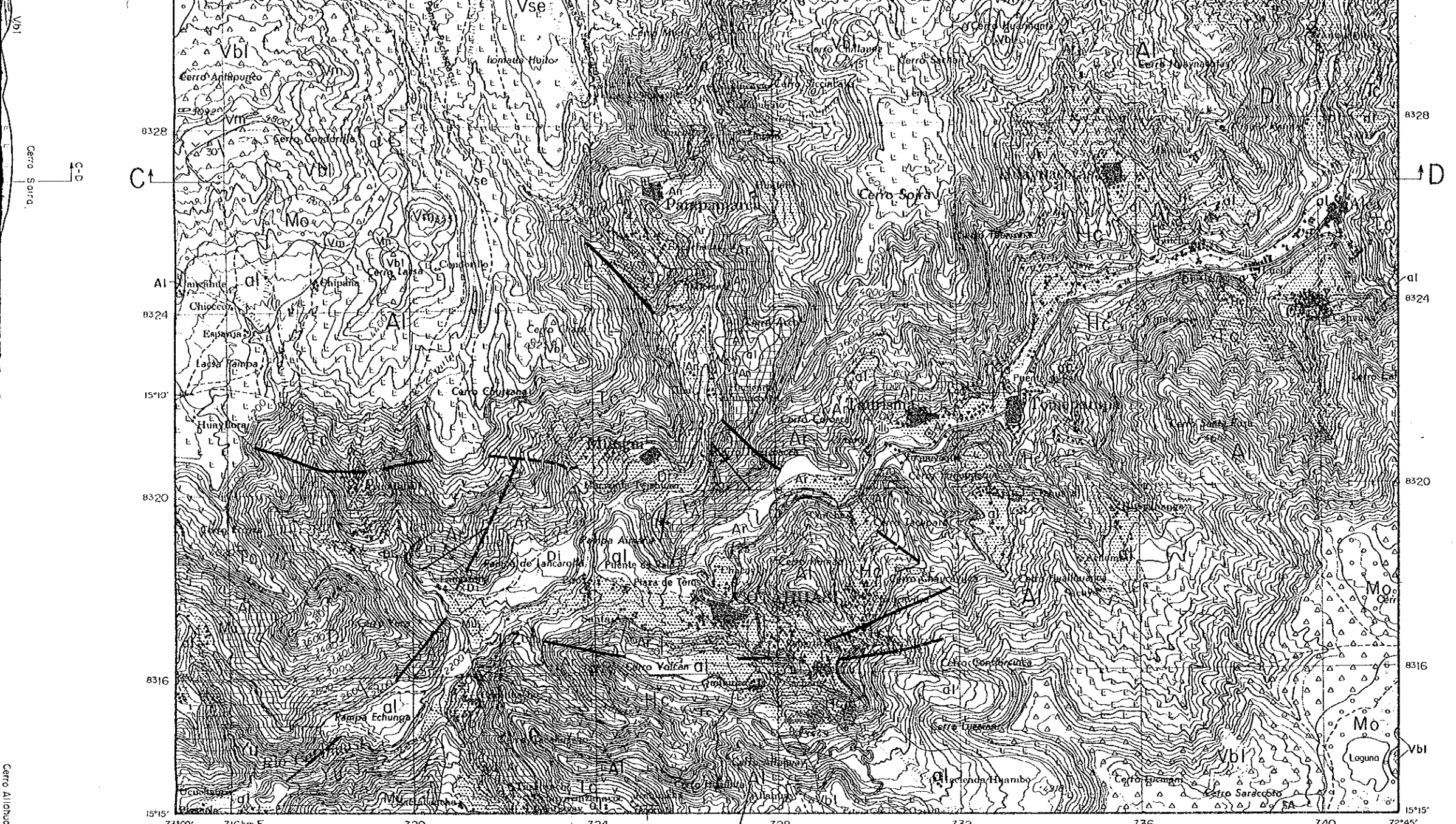
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LEGEND

Cenozoic	Quaternary	Alluvium	al	Sand, silt, clay	
		Mollebamba Volcanic Rocks	Vm	Andesite	
		Volcanic Sediment of Pauso	o'v'p	Volcanic	
		Lampa Volcanic Rocks	A'Vlo	Andesite	
	Pleistocene	Moraine Sediment	Mo	Gravel, sand, silt, clay	
		Barroso Group	Upper	Vbu	Acidic
	Lower		Vbl	Andesite	
	Tertiary	Pliocene	Sencca Volcanic Rocks	L'Vse	Hornblende welded
			Huayllillas Formation	H'y	Dacitic
		Miocene	Alpabamba Formation	L'Al	Dacitic and welded (partly)
			Tacaza Formation	V'V'Tc	Andesite and dacite
		Paleocene	Huanca Formation	V'V'Hc	Andesite and tuffaceous
Cretaceous			Arcaquino Formation	A'Ar	Limestone and chert
	Murco Formation	Mu	Red shales bearing quartzites and other		
Jurassic	Yuro Group	Yu	Quartzites and other		
	Socosani Formation	So	Black shales		
	Chocolate volcanic rocks	Cho	Andesite tuffaceous		
Precambrian		Gn	Gneiss, schists, etc.		
Tertiary	Intrusive Rocks	Stock and Dyke	V'V'An	Hornblende	
		Accha Stock	X'X'DI	Diorite	
	Cretaceous	La Costa Batholith	+ + + + CB	Quartz	

- Fault
- - - Inferred
- ∧ Anticline
- ∩ Syncline
- Geological
- AL 9 Geological
- 30 Strike
- 50 Strike
- Strike
- X Mine
- ⊕ Hot spring

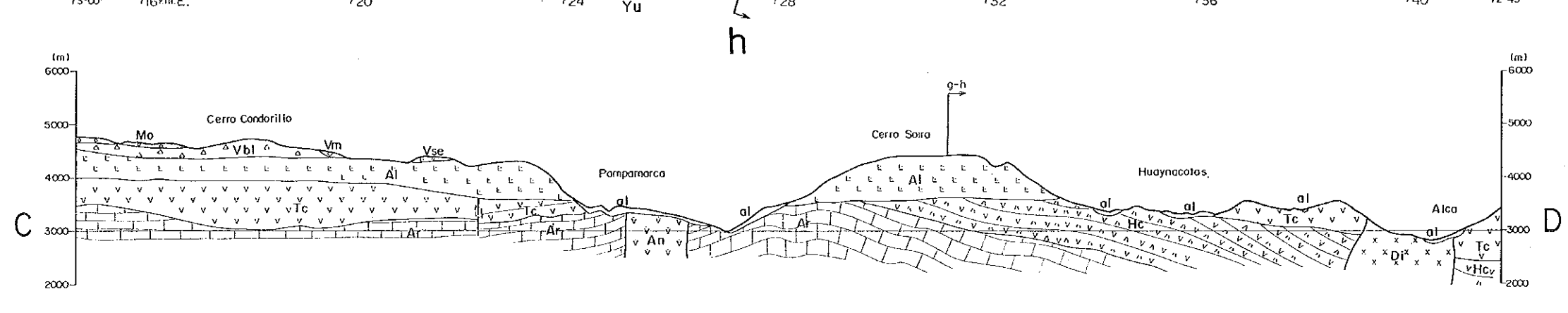




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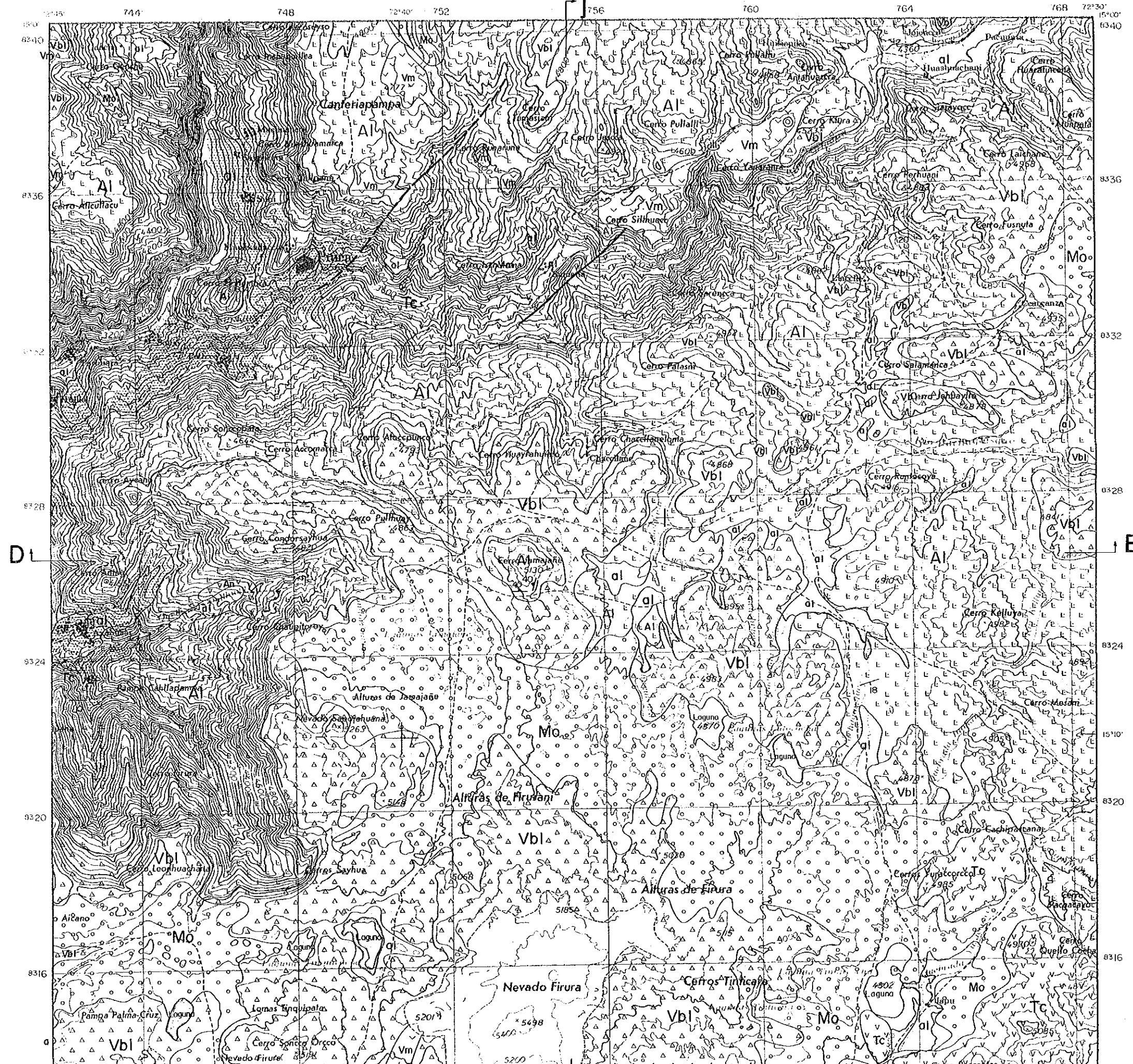
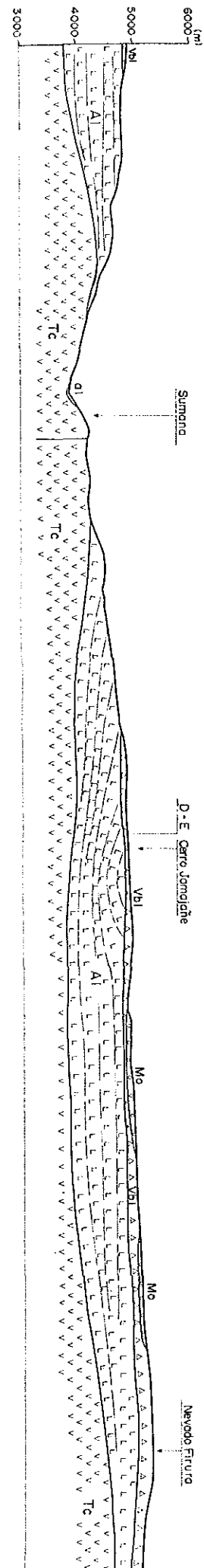
LEGEND

Cenozoic	Quaternary	Alluvium	al	Sand, mud and gravel	
		Mollebamba Volcanic Rocks	Vm	Andesite lava and volcanic ash	
		Volcanic Sediment of Pausa	Vsp	Volcanic ash, sand and gravel	
		Lampa Volcanic Rocks	Vla	Andesite (basaltic), volcanic breccia	
	Tertiary	Pleistocene	Moraine Sediment	Mo	Gravel, sand and mud
			Barroso Group	Upper	Vbu
		Lower		Vbl	Andesite lava and pyroclastic rocks
		Pliocene	Sencca Volcanic Rocks	Vse	Hornblende-biotite dacite lava, welded tuff and tuff
			Huayllillas Formation	Hy	Dacitic tuff (partly pumice bearing)
			Alpabamba Formation	Al	Dacitic tuff, lapilli tuff, tuff breccia and welded tuff (partly with dacite lava or andesite lava)
Tacaza Formation	Tc		Andesitic tuff breccia, Andesite, tuff and dacitic tuff breccia (greenish grey)		
Mesozoic	Cretaceous	Huanca Formation	Hc	Andesitic volcanic conglomerate, tuff breccia and tuffaceous sandstone (greenish grey)	
		Arcurquina Formation	Ar	Limestone and marl with sandstone and chert nodule	
		Murco Formation	Mu	Red shale and sandstone with gypsum bearing conglomerate	
		Yura Group	Yu	Quartzite, siliceous sandstone, black shale and alternation of quartzite and shale	
	Jurassic	Socosani Formation	So	Black shale, limestone with sandstone and tuff	
		Chocote volcanic rocks	Cho	Andesitic tuff breccia, tuff, andesite and tuffaceous sandstone	
		Precambrian		Gn	Gneiss, gneissose granite and diorite
Tertiary	Intrusive Rocks	Stock and Dyke	An	Hornblende andesite, andesite	
		Accha Stock	Di	Diorite and quartz diorite	
	Cretaceous	La Costa Batholith	CB	Quartz diorite and granodiorite	



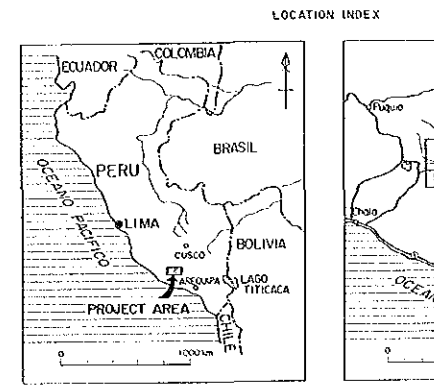
COTAHUASI

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MINERAL EXPLORATION
IN
COTAHUASI AREA
(PHASE 1)

GEOLOGICAL MAP OF THE REGIONAL SURVEY (4)



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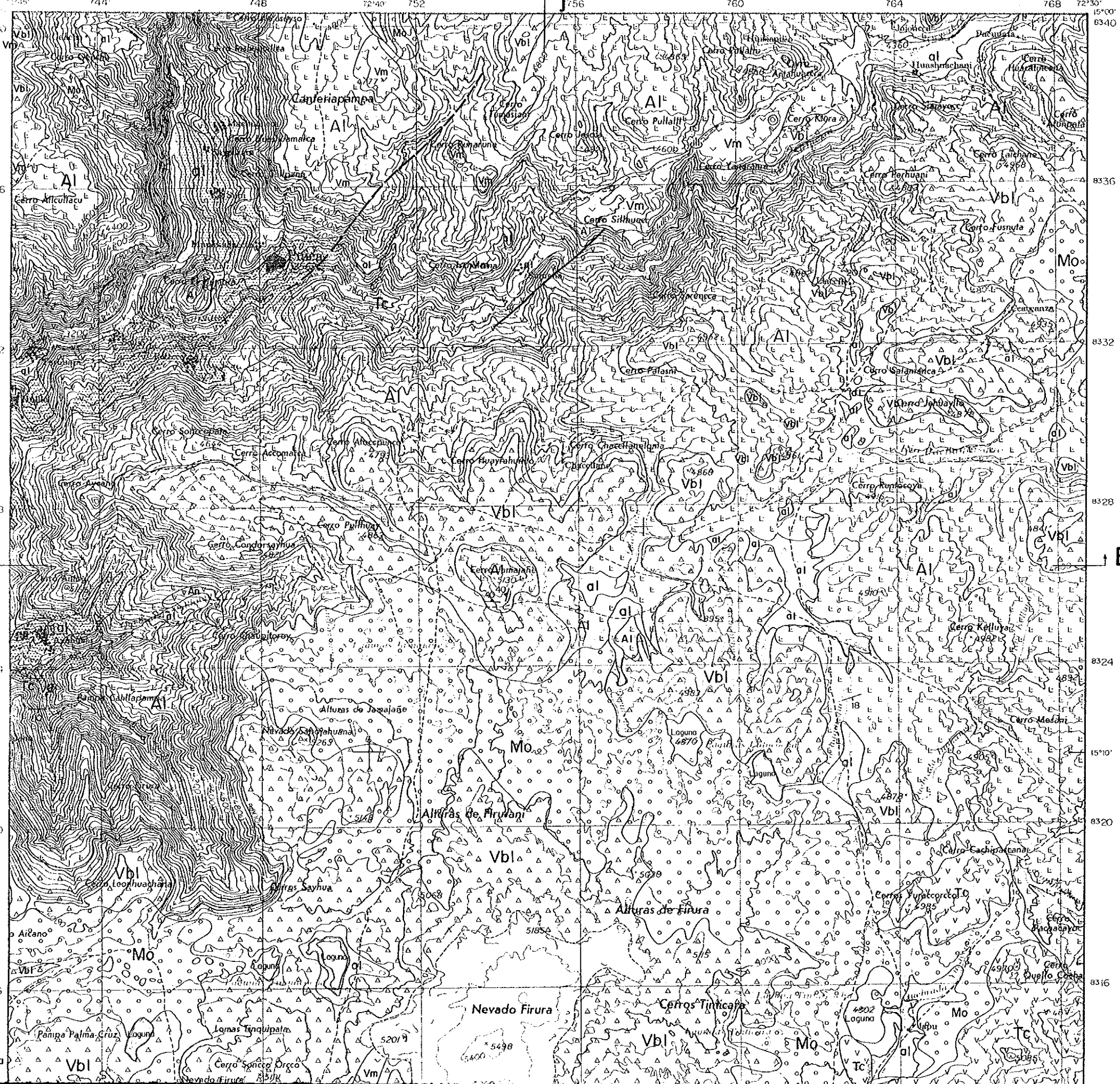
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LEGEND

Cenozoic	Quaternary	Alluvium	al	Sand, mud and c...	
		Mollebamba Volcanic Rocks	vm	Andesite lava and...	
		Volcanic Sediment of Pausa	ovsp	Volcanic ash, sa...	
		Lampa Volcanic Rocks	avio	Andesite (basalti...	
	Pleistocene	Moraine Sediment	mo	Gravel, sand and...	
		Barroso Group	Upper	vbu	Acidic tuff
	Lower		vbl	Andesite lava c...	
	Tertiary	Pliocene	Sencca Volcanic Rocks	lvse	Hornblende-bioti... welded tuff and...
			Huayllillas Formation	hy	Dacitic tuff (par...
		Miocene	Alpabamba Formation	al	Dacitic tuff, tafi... and welded tuff (partly with dacit...
Tacaña Formation			tc	Andesitic tuff br... and dacitic tuff l...	
Huancá Formation			hc	Andesitic volcani... and tuffaceous s...	
Mesozoic	Cretaceous	Arcarguina Formation	arc	Limestone and m... and chert nodul...	
		Murco Formation	mu	Red shale and so... bearing conglomer...	
	Jurassic	Yura Group	yu	Quartzite, siliceous and alternation of...	
		Socosani Formation	so	Black shale, limes...	
Precambrian	Chocolate volcanic rocks	cho	Andesitic tuff bre... tuffaceous sandst...		
		gn	Gneiss, gneissose		
Tertiary	Intrusive Rocks	Stock and Dyke	an	Hornblende ande...	
		Aecha Stock	di	Diorite and quar...	

COTAHUASI

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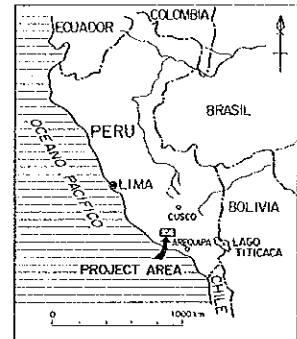



PL. 3-(4)

MINERAL EXPLORATION
IN
COTAHUASI AREA
(PHASE 1)


GEOLOGICAL MAP OF THE REGIONAL SURVEY AREA (4)

LOCATION INDEX

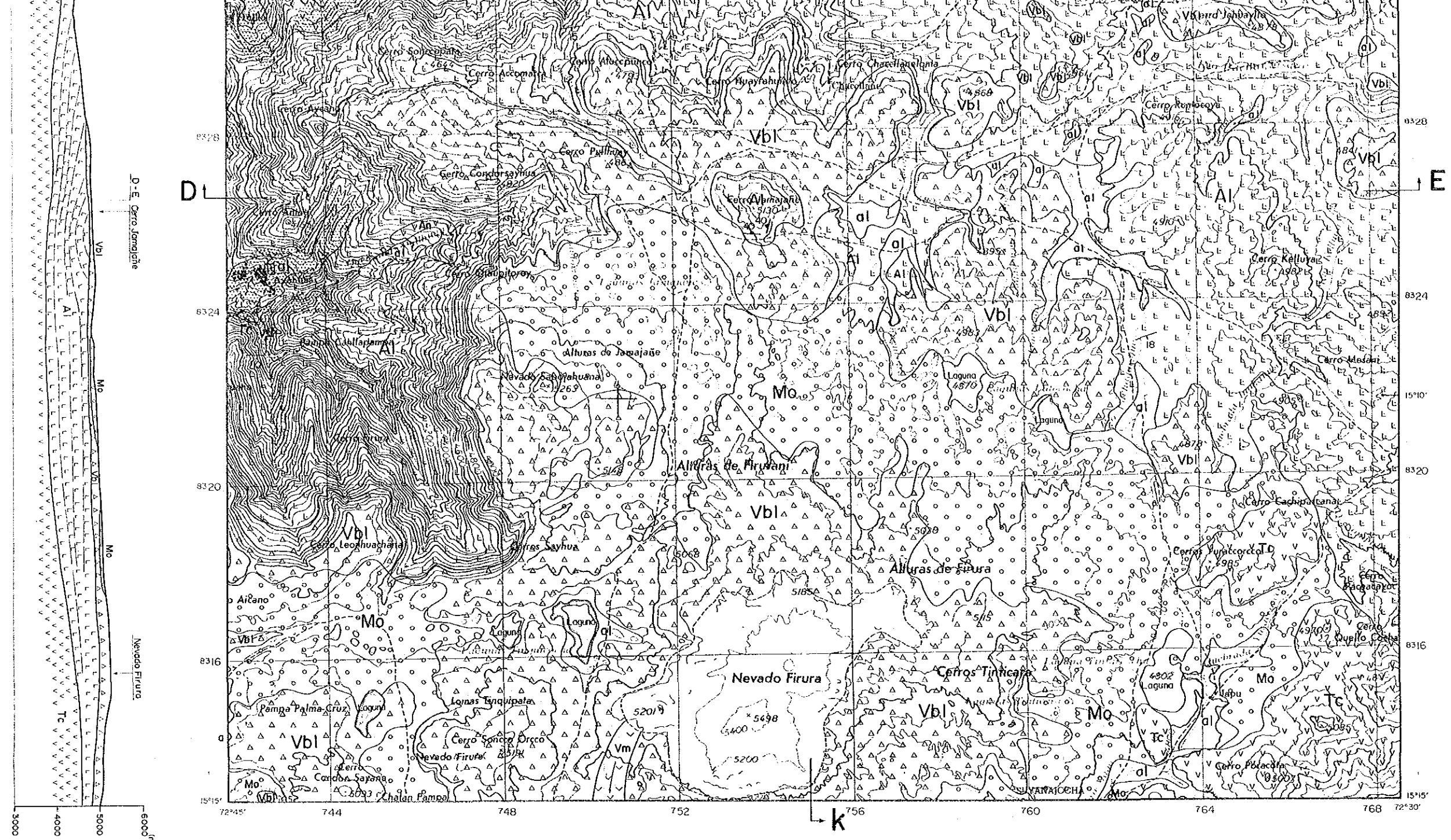
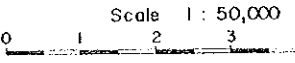
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METAL MINING AGENCY OF JAPAN
INSTITUTO GEOLOGICO MINERO Y METALURGICO
February 1986

Scale 1 : 50,000



LEGEND

Mesozoic	Cretaceous	Chocolate volcanic rocks		Andesitic tuff breccia, tuff, andesite and tuffaceous sandstone	
		Jurassic	Socosani Formation		Black shale, limestone with sandstone and tuff
			Yura Group		Quartzite, siliceous sandstone, black shale and alternation of quartzite and shale
	Cretaceous	Murco Formation		Red shale and sandstone with gypsum bearing conglomerate	
		Arcuquina Formation		Limestone and marl with sandstone and chert nodule	
		Huanca Formation		Andesitic volcanic conglomerate, tuff breccia and tuffaceous sandstone (greenish grey)	
	Tertiary	Miocene	Tacaza Formation		Andesitic tuff breccia, Andesite, tuff and dacitic tuff breccia (greenish grey)
			Alpabamba Formation		Dacitic tuff, lapilli tuff, tuff breccia and welded tuff (partly with dacite lava or andesite lava)
			Huayllitas Formation		Dacitic tuff (partly pumice bearing)
			Sencca Volcanic Rocks		Hornblende-biotite dacite lava, welded tuff and tuff
	Cenozoic	Pliocene	Borroso Group (Lower)		Andesite lava and pyroclastic rocks
			Borroso Group (Upper)		Acidic tuff
		Quaternary	Lampa Volcanic Rocks		Andesite (basaltic), volcanic breccia
			Volcanic Sediment of Pausa		Volcanic ash, sand and gravel
	Quaternary	Holocene	Mollebamba Volcanic Rocks		Andesite lava and volcanic ash
Alluvium				Sand, mud and gravel	
Intrusive Rocks				Hornblende andesite, andesite	
Tertiary	Stock and Dyke	Stock and Dyke		Hornblende andesite, andesite	
		Gneiss		Gneiss, gneissose granite and diorite	

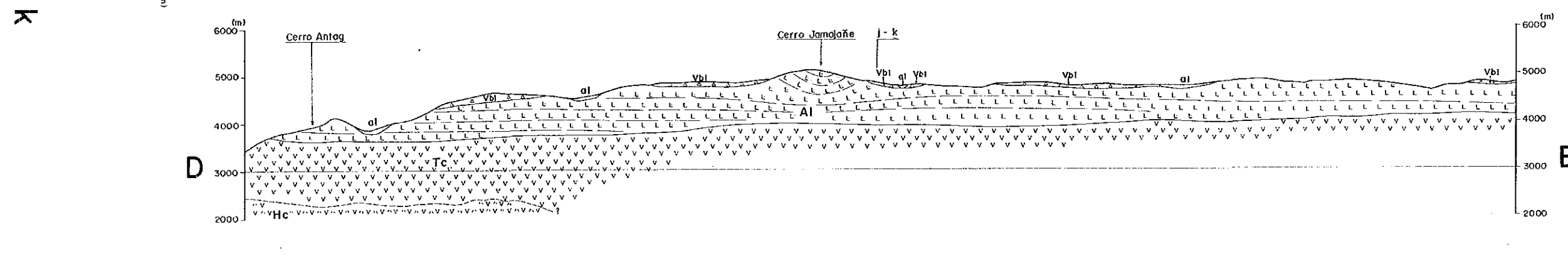


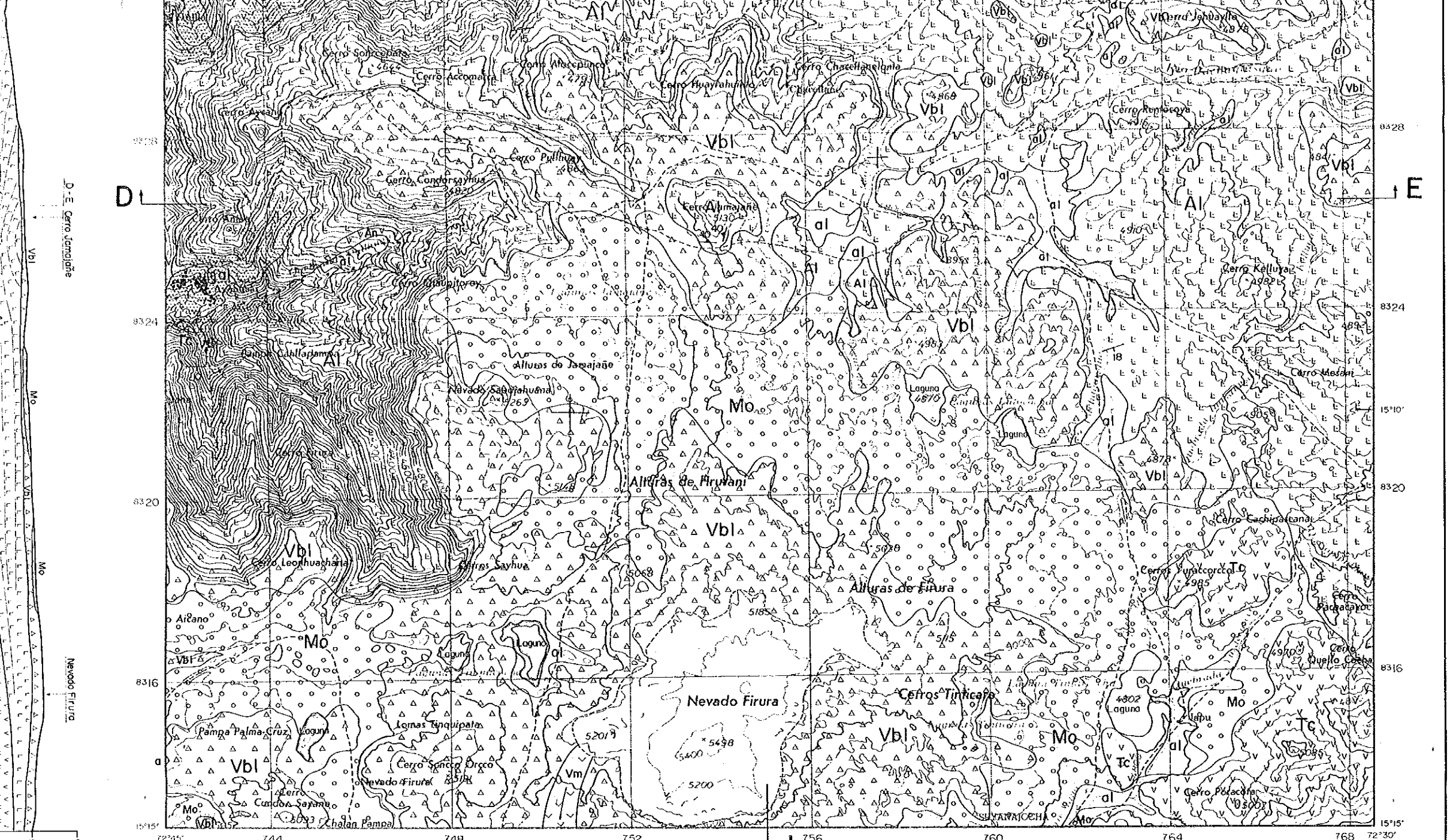
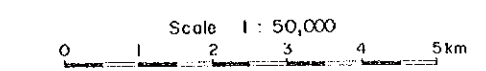
LEGEND

Cenozoic	Quaternary	<table border="0"> <tr> <td>Attuvium</td> <td>al</td> <td>Sand, mud and silt</td> </tr> <tr> <td>Mollebamba Volcanic Rocks</td> <td>Vv</td> <td>Andesite lava and tuff</td> </tr> <tr> <td>Volcanic Sediment of Pausa</td> <td>o</td> <td>Volcanic ash, sand and tuff</td> </tr> <tr> <td>Lampa Volcanic Rocks</td> <td>Vv</td> <td>Andesite (basaltic)</td> </tr> </table>	Attuvium	al	Sand, mud and silt	Mollebamba Volcanic Rocks	Vv	Andesite lava and tuff	Volcanic Sediment of Pausa	o	Volcanic ash, sand and tuff	Lampa Volcanic Rocks	Vv	Andesite (basaltic)	Pliocene	<table border="0"> <tr> <td>Moraine Sediment</td> <td>Mo</td> <td>Gravel, sand and silt</td> </tr> <tr> <td>Barroso Group</td> <td>Vv</td> <td>Acidic tuff</td> </tr> <tr> <td></td> <td>Vv</td> <td>Andesite lava</td> </tr> </table>	Moraine Sediment	Mo	Gravel, sand and silt	Barroso Group	Vv	Acidic tuff		Vv	Andesite lava	Tertiary	<table border="0"> <tr> <td>Sencca Volcanic Rocks</td> <td>Vv</td> <td>Hornblende-biotite welded tuff and dacite</td> </tr> <tr> <td>Huayllillas Formation</td> <td>Hy</td> <td>Dacitic tuff (partly with dacite)</td> </tr> <tr> <td>Alpabamba Formation</td> <td>Al</td> <td>Dacitic tuff, lava and welded tuff (partly with dacite)</td> </tr> <tr> <td>Tacaza Formation</td> <td>Tc</td> <td>Andesitic tuff and dacitic tuff</td> </tr> <tr> <td>Huancabamba Formation</td> <td>Hc</td> <td>Andesitic volcanic and tuffaceous sand</td> </tr> <tr> <td>Arcurquina Formation</td> <td>Ar</td> <td>Limestone and chert nodules</td> </tr> <tr> <td>Murco Formation</td> <td>Mu</td> <td>Red shale and bearing conglomerate</td> </tr> <tr> <td>Yura Group</td> <td>Yu</td> <td>Quartzite, siliceous and alternation</td> </tr> <tr> <td>Socosani Formation</td> <td>So</td> <td>Black shale, limestone</td> </tr> <tr> <td>Chocolate volcanic rocks</td> <td>Cho</td> <td>Andesitic tuff and tuffaceous sand</td> </tr> <tr> <td>Precambrian</td> <td>Gn</td> <td>Gneiss, gneissoid</td> </tr> </table>	Sencca Volcanic Rocks	Vv	Hornblende-biotite welded tuff and dacite	Huayllillas Formation	Hy	Dacitic tuff (partly with dacite)	Alpabamba Formation	Al	Dacitic tuff, lava and welded tuff (partly with dacite)	Tacaza Formation	Tc	Andesitic tuff and dacitic tuff	Huancabamba Formation	Hc	Andesitic volcanic and tuffaceous sand	Arcurquina Formation	Ar	Limestone and chert nodules	Murco Formation	Mu	Red shale and bearing conglomerate	Yura Group	Yu	Quartzite, siliceous and alternation	Socosani Formation	So	Black shale, limestone	Chocolate volcanic rocks	Cho	Andesitic tuff and tuffaceous sand	Precambrian	Gn	Gneiss, gneissoid
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Tertiary	Intrusive Rocks	Stock and Dyke	Vv	Hornblende and quartz
		Acho Stock	X	Diorite and quartz
	Cretaceous	La Costa Batholith	CB	Quartz diorite and granite

- Fault
- - - Inferred fault
- ~ Anticline
- ~ Syncline
- Geological boundary
- Geological projection
- 30° Strike and dip
- 50° Strike and dip
- Strike and dip
- X Mine (working)
- ⊕ Hot spring





LEGEND

Cenozoic	Quaternary	Alluvium	al	Sand, mud and gravel	
		Mollebamba Volcanic Rocks	Vm	Andesite lava and volcanic ash	
		Volcanic Sediment of Pausa	Vsp	Volcanic ash, sand and gravel	
		Lampo Volcanic Rocks	Vl	Andesite (basaltic), volcanic breccia	
	Pleistocene	Moraine Sediment	Mo	Gravel, sand and mud	
		Barroso Group	Upper	Vbu	Acidic tuff
	Lower		Vbl	Andesite lava and pyroclastic rocks	
	Tertiary	Pliocene	Sencca Volcanic Rocks	Vst	Hornblende-biotite dacite lava, welded tuff and tuff
			Huayllillas Formation	Hy	Dacitic tuff (partly pumice bearing)
		Miocene	Alpabamba Formation	Al	Dacitic tuff, lapilli tuff, tuff breccia (partly with dacite lava or andesite lava)
Tacaza Formation			Tc	Andesitic tuff breccia, Andesite, tuff and dacitic tuff breccia (greenish grey)	
Oligocene		Huanca Formation	Hc	Andesitic volcanic conglomerate, tuff breccia and tuffaceous sandstone (greenish grey)	
		Arcuquina Formation	Arc	Limestone and marl with sandstone and chert nodule	
Mesozoic	Cretaceous	Murco Formation	Mu	Red shale and sandstone with gypsum bearing conglomerate	
		Yura Group	Yu	Quartzite, siliceous sandstone, black shale and alternation of quartzite and shale	
	Jurassic	Socosani Formation	So	Black shale, limestone with sandstone and tuff	
		Chocolate volcanic rocks	Cho	Andesitic tuff breccia, tuff, andesite and tuffaceous sandstone	
Precambrian		Gn	Gneiss, gneissose granite and diorite		
Tertiary	Intrusive Rocks	Stock and Dyke	An	Hornblende andesite, andesite	
		Accha Stock	Ad	Diorite and quartz diorite	
	Cretaceous	Lo Costa Batholith	Lc	Quartz diorite and granodiorite	
<p>Geological symbols:</p> <ul style="list-style-type: none"> Fault Inferred fault Anticline Syncline Geological boundary Geological profile line Strike and dip of bedding Strike and dip of foliation Strike and dip of flow structure Mine (working or closed) Hot spring 					

