

REPORT  
ON  
THE MINERAL EXPLORATION  
IN  
THE BOLIVAR AREA  
REPUBLIC OF ECUADOR

(PHASE I)

MARCH 1989

JAPAN INTERNATIONAL COOPERATION AGENCY  
METAL MINING AGENCY OF JAPAN

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REPORT ON THE MINERAL EXPLORATION  
IN THE BOLIVAR AREA REPUBLIC OF ECUADOR

(PHASE I)

MARCH 1989

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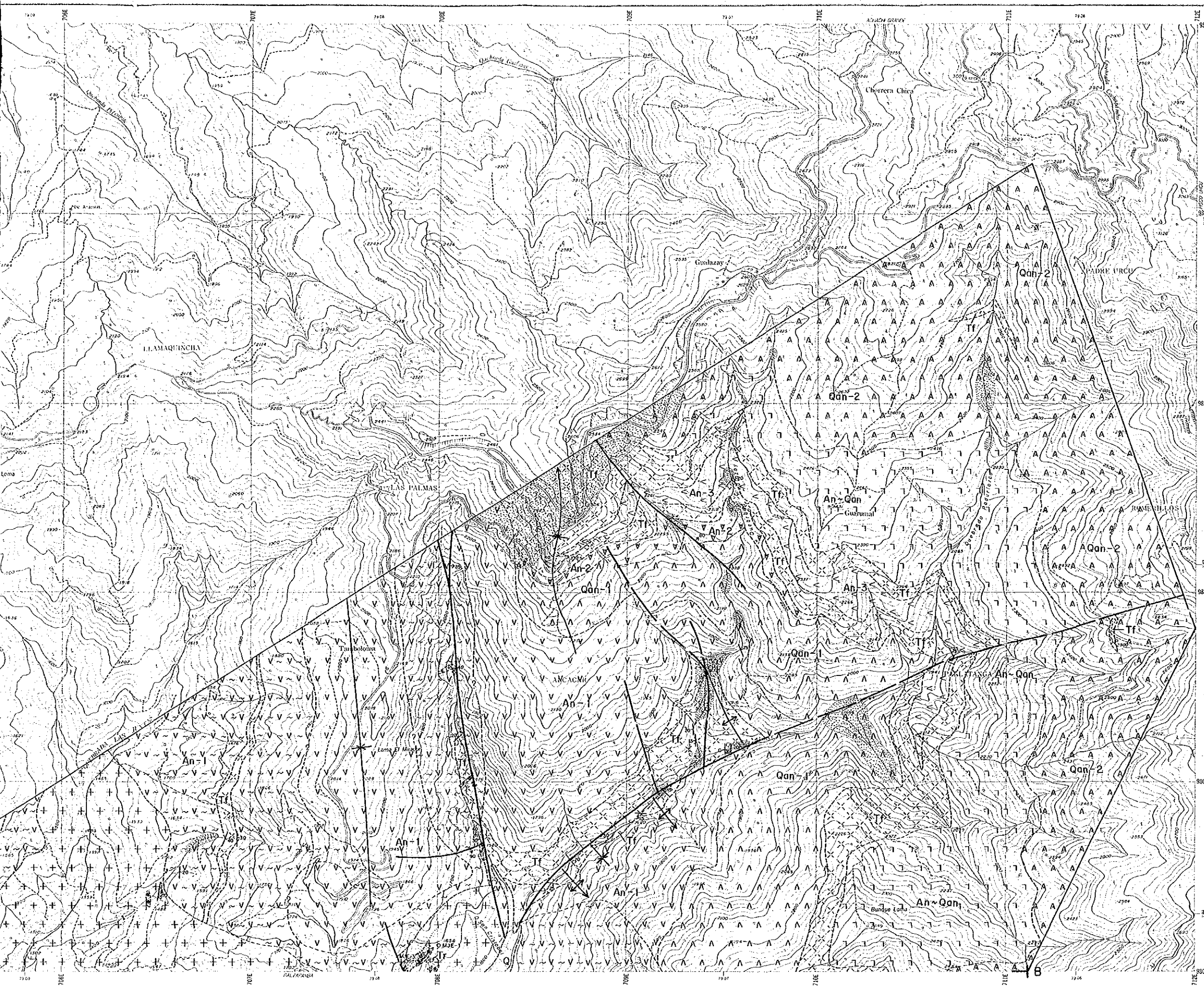
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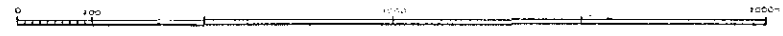




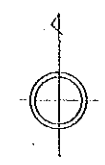
# BALZAPAMBA 2-1



1:10,000



BALZAPAMBA 2-1  
BALZAPAMBA 2-2  
LAS GUARDIAS



PL-II-1-1(I)

REPORT ON THE MINERAL EXPLORATION  
IN  
THE BOLIVAR AREA, REPUBLIC OF ECUADOR  
PHASE I  
Geological Map of the Balzapamba Area  
(North)

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METAL MINING AGENCY OF JAPAN  
FEBRUARY 1989

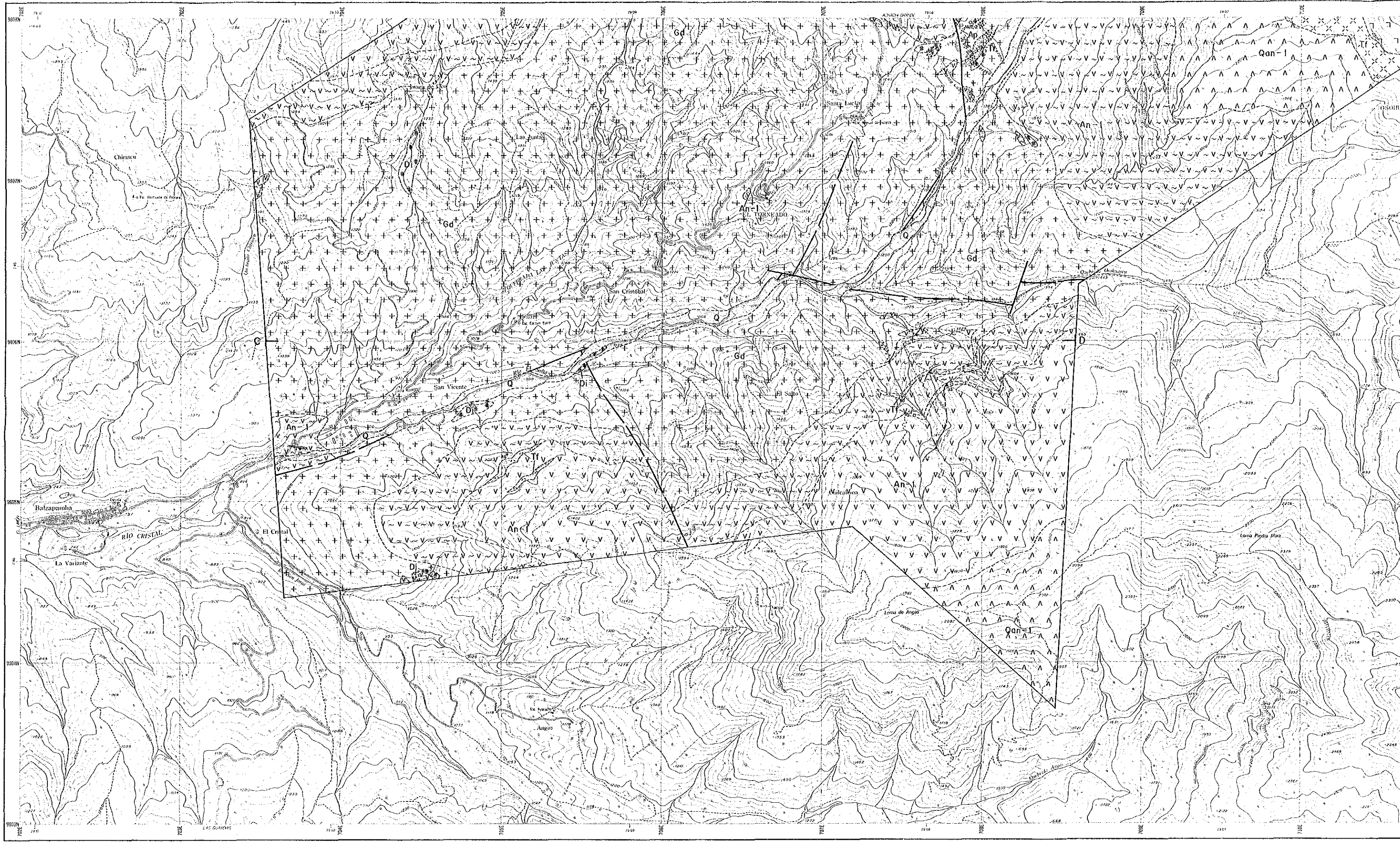
Scale 1:10,000 1km

## LEGEND

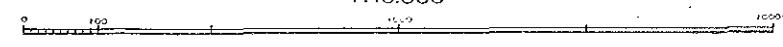
|                                 |        |  |
|---------------------------------|--------|--|
| Quaternary                      | Q      | Gravel, sand, clay   |
|                                 | Qan-2  | Quartz-bg. andesite lava with its pyroclastics (Tf) (F Member)                           |
|                                 | An-Qan | Alternation of andesite and quartz-bg. andesite lavas with their pyroclastics (E Member) |
|                                 | An-3   | Andesite lava with quartz-bg. andesite lava (D Member)                                   |
|                                 | Tf     | Andesite to quartz-bg. andesitic pyroclastics (D Member)                                 |
|                                 | An-2   | Andesite lava (C Member)   |
| Cretaceous<br>Macachi Formation | Qan-1  | Quartz-bg. andesite lava with its pyroclastics (B Member)                                |
|                                 | An-1   | Andesite lava with its pyroclastics and sediment (Tf), and hornfels (A Member)           |
|                                 | Gd     | Granodiorite   |
| Intrusive<br>Rocks              | Di     | Melanocratic diorite dyke  |
|                                 | Tr     | Trachyandesite dyke  |
|                                 | Ap     | Aplite dyke  |
|                                 | 20     | Dip and strike of bedding plane  |
|                                 |        | Geological boundary  |
|                                 |        | Fault  |
|                                 |        | Anticlinal axis  |
|                                 |        | Synclinal axis   |
|                                 |        | Mineralized zone (Presumed)  |
|                                 |        | Vein   |
|                                 |        | Alteration zone  |
|                                 | A B    | Section line   |



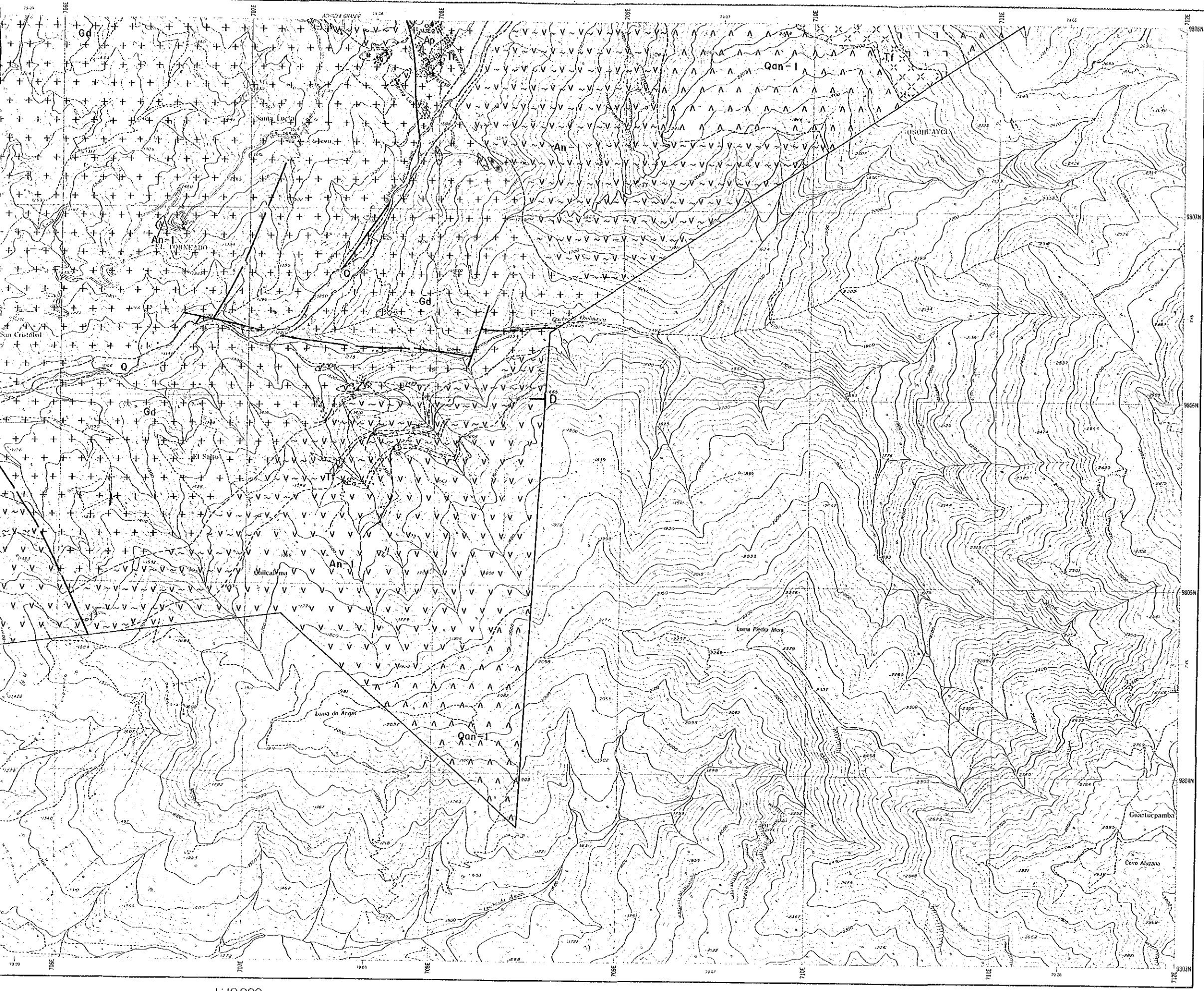
# BALZAPAMBA 2-2



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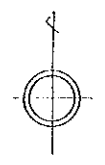


# BALZAPAMBA 2-2



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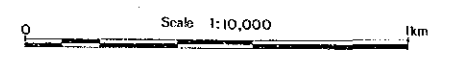
BALZAPAMBA 2-1  
BALZAPAMBA 2-2  
LAS GUARDIAS



PL. II-1-1(2)

REPORT ON THE MINERAL EXPLORATION  
IN  
THE BOLIVAR AREA, REPUBLIC OF ECUADOR  
PHASE I  
Geological Map of the Balzapamba Area  
(South)

JAPAN INTERNATIONAL COOPERATION AGENCY  
METAL MINING AGENCY OF JAPAN  
FEBRUARY 1989

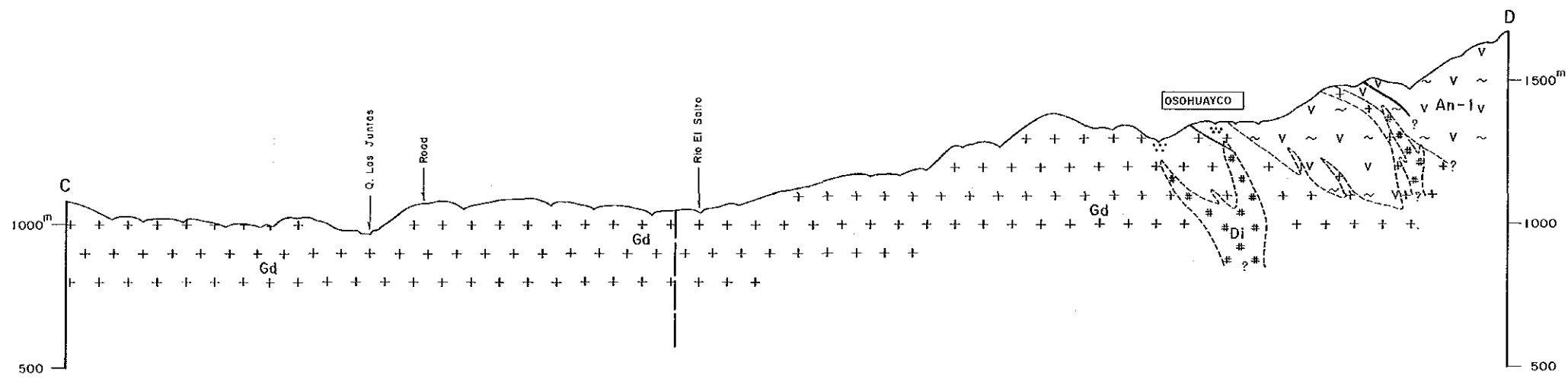
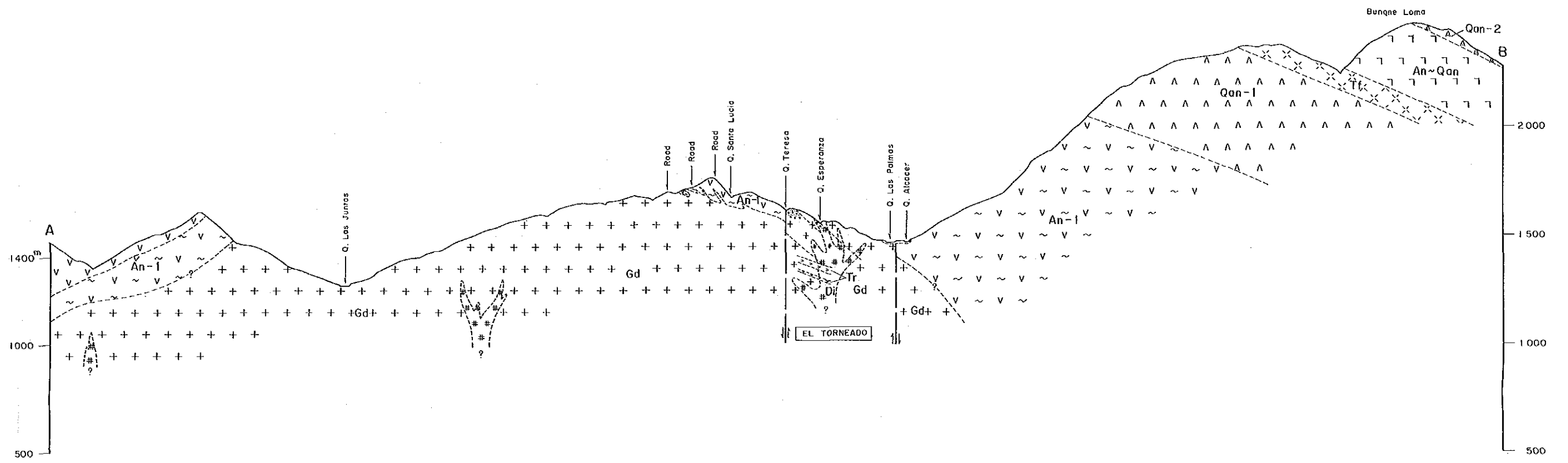


## LEGEND

|                                 |        |  |
|---------------------------------|--------|--|
| Quaternary                      | Q      | Gravel, sand, clay   |
|                                 | Qan-2  | Quartz-bg. andesite lava with its pyroclastics (Tf) (F Member)                           |
|                                 | An-Qan | Alternation of andesite and quartz-bg. andesite lavas with their pyroclastics (E Member) |
|                                 | An-3   | Andesite lava with quartz-bg. andesite lava (D Member)                                   |
|                                 | Tf     | Andesite to quartz-bg. andesitic pyroclastics (D Member)                                 |
|                                 | An-2   | Andesite lava (C Member)   |
|                                 | Qan-1  | Quartz-bg. andesite lava with its pyroclastics (B Member)                                |
| Cretaceous<br>Macuchi Formation | An-1   | Andesite lava with its pyroclastics and sediment (Tf), and hornfels (A Member)           |
|                                 | Gd     | Granodiorite   |
|                                 | Di     | Melanocratic diorite dyke  |
|                                 | Tr     | Trachyandesite dyke  |
| Intrusive<br>Rocks              | Ap     | Aplite dyke  |
|                                 | A      | Alteration zone  |

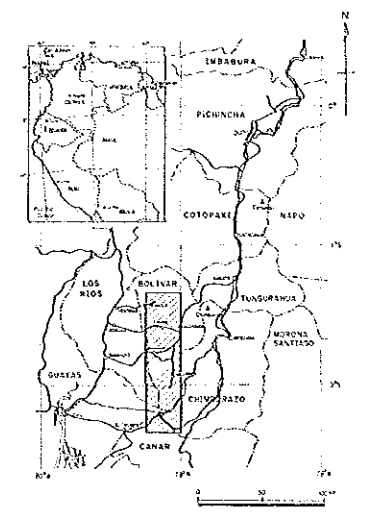
  

|       |                                 |
|-------|---------------------------------|
| 20    | Dip and strike of bedding plane |
| —     | Geological boundary             |
| —     | Fault                           |
| —     | Anticlinal axis                 |
| —     | Synclinal axis                  |
| •••   | Mineralized zone                |
| —     | Vein                            |
| •••   | Alteration zone                 |
| A — B | Section line                    |

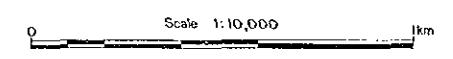




REPORT ON THE MINERAL EXPLORATION  
IN  
THE BOLIVAR AREA, REPUBLIC OF ECUADOR  
PHASE I  
Geological Profile of the Balzapamba Area

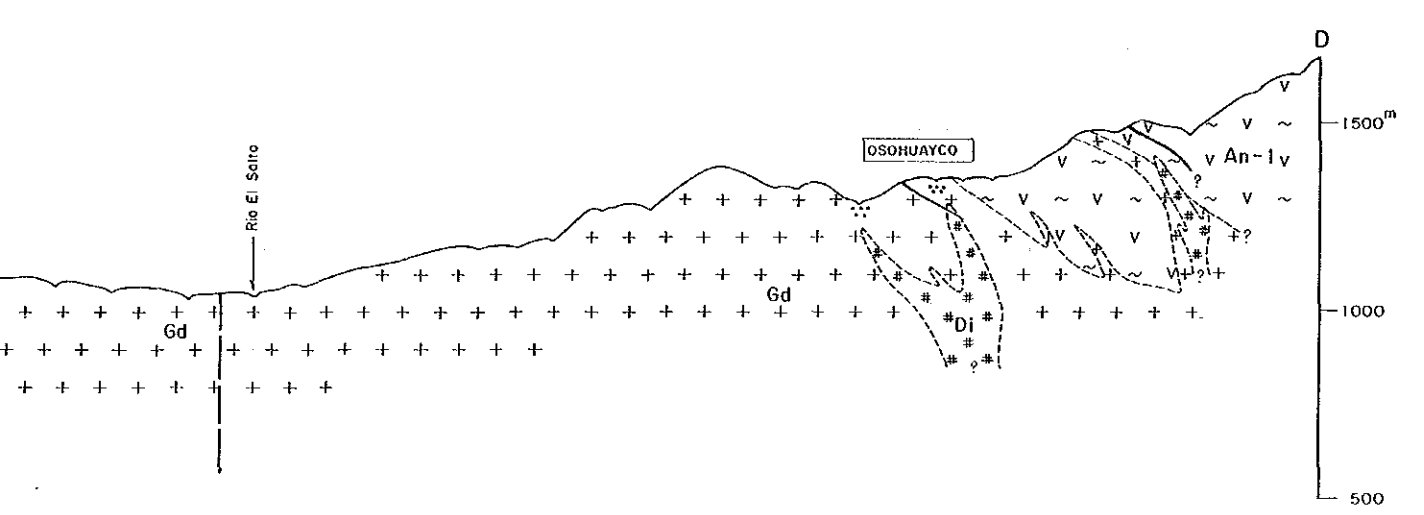
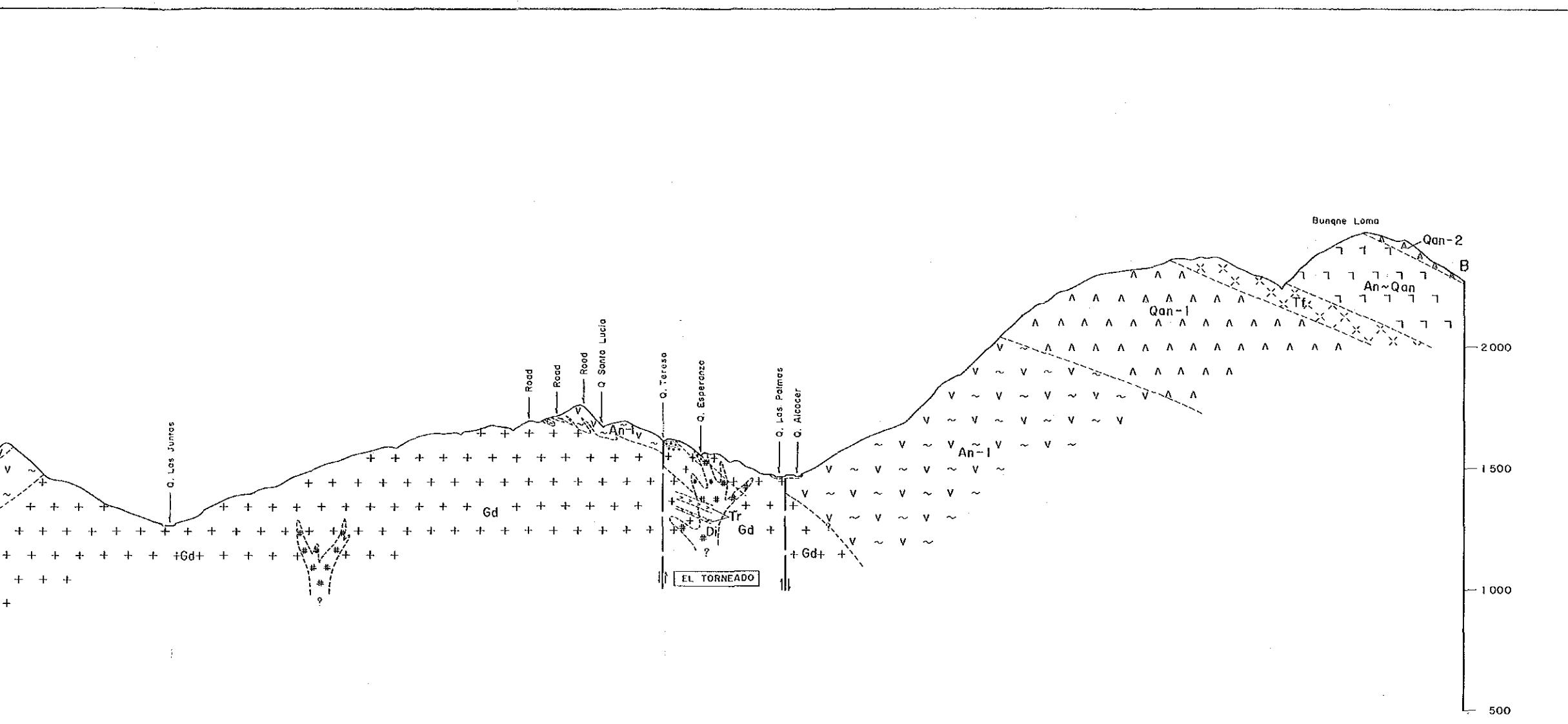


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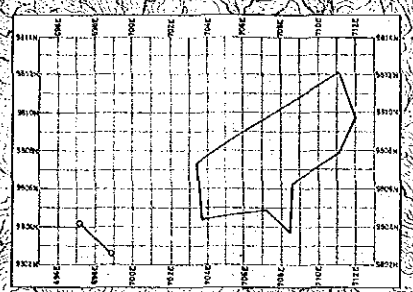
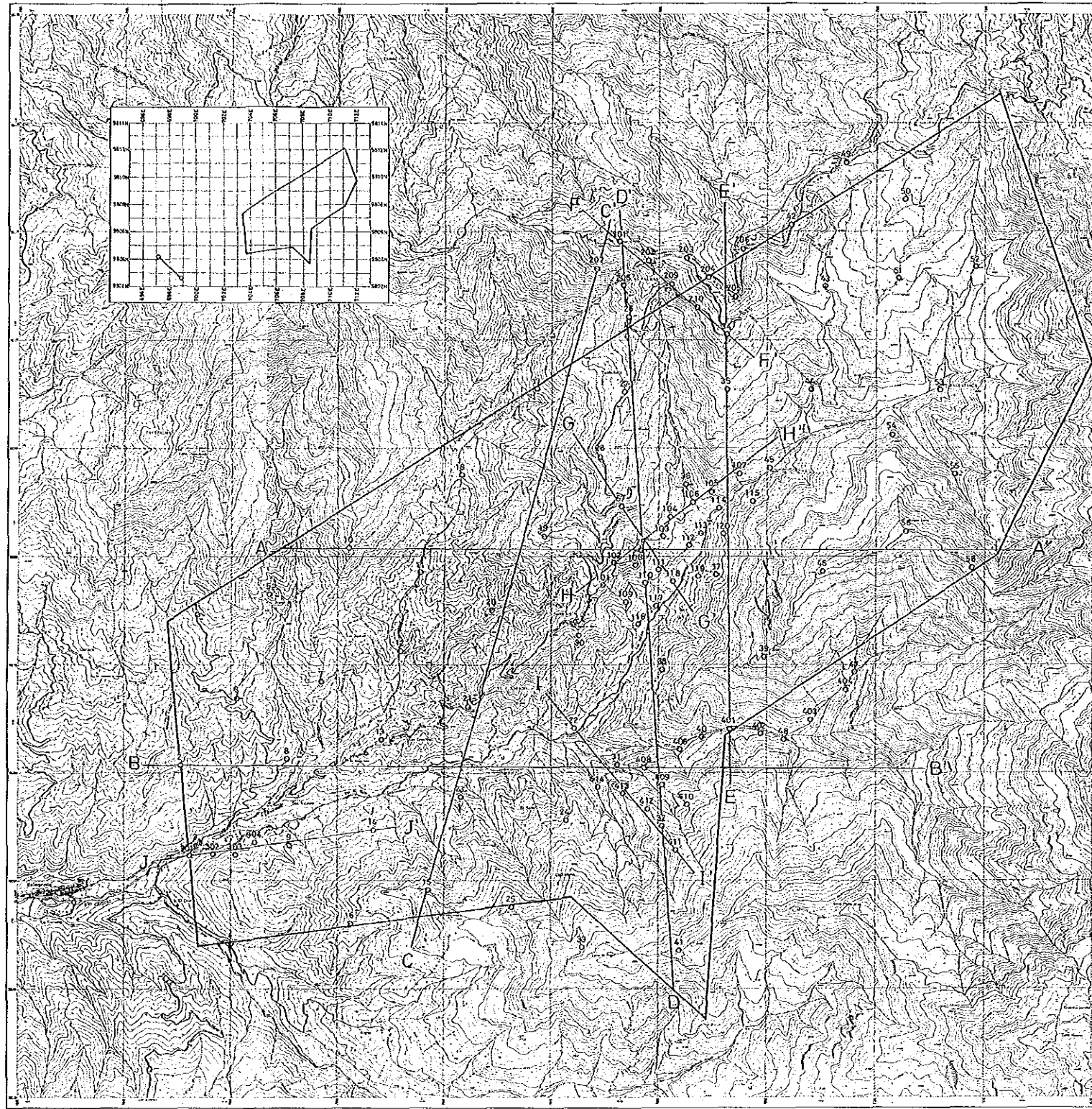
LEGEND

|                              |                                 |  |
|------------------------------|---------------------------------|--|
| Quaternary                   | Q                               | Gravel, sand, clay   |
|                              | Qan-2                           | Quartz-bg. andesite lava with its pyroclastics (TI) (F Member)                           |
|                              | An~Qan                          | Alternation of andesite and quartz-bg. andesite lavas with their pyroclastics (E Member) |
|                              | An-3                            | Andesite lava with quartz-bg. andesite lava (D Member)                                   |
|                              | Tf                              | Andesite to quartz-bg. andesitic pyroclastics (D Member)                                 |
|                              | An-2                            | Andesite lava (C Member)   |
|                              | Qan-1                           | Quartz-bg. andesite lava with its pyroclastics (B Member)                                |
| Cretaceous Macuchi Formation | An-1                            | Andesite lava with its pyroclastics and sediment (TI), and hornfels (A Member)           |
|                              | Gd                              | Granodiorite   |
|                              | Di                              | Metanocratic diorite dyke  |
|                              | Tr                              | Trachyandesite dyke  |
| Intrusive Rocks              | Ap                              | Aplite dyke  |
|                              | Dip and strike of bedding plane |  |
|                              | Geological boundary             |  |
|                              | Fault                           |  |
| Anticlinol axis              |                                 |  |
| Synclinal axis               |                                 |  |
| Mineralized zone             |                                 |  |
| Vein                         |                                 |  |
| Alteration zone              |                                 |  |
| Section line                 |                                 |  |





BALZAPAMBA

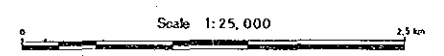


PL. II-1-3

REPORT ON THE MINERAL EXPLORATION  
IN  
THE BOLIVAR AREA, REPUBLIC OF ECUADOR  
PHASE I

Location Map of Observed Stations

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- LEGEND
- Station and No.
  - Section
  - Survey Area
  - Current Electrode

BALZAPAMBA



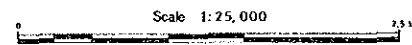
PL. II-1-4

REPORT ON THE MINERAL EXPLORATION  
IN  
THE BOLIVAR AREA, REPUBLIC OF ECUADOR  
PHASE I



Apparent Resistivity Plan Map (2,048Hz)

The inset map shows the outline of Ecuador with a grid. A shaded rectangular area in the central-eastern part of the country indicates the location of the Bolivar area. Labels on the inset map include Imbabura, Pichincha, Cotacachi, Napo, Los Rios, Tungurahua, Morona Santiago, Chimborazo, Canar, and Guayas.

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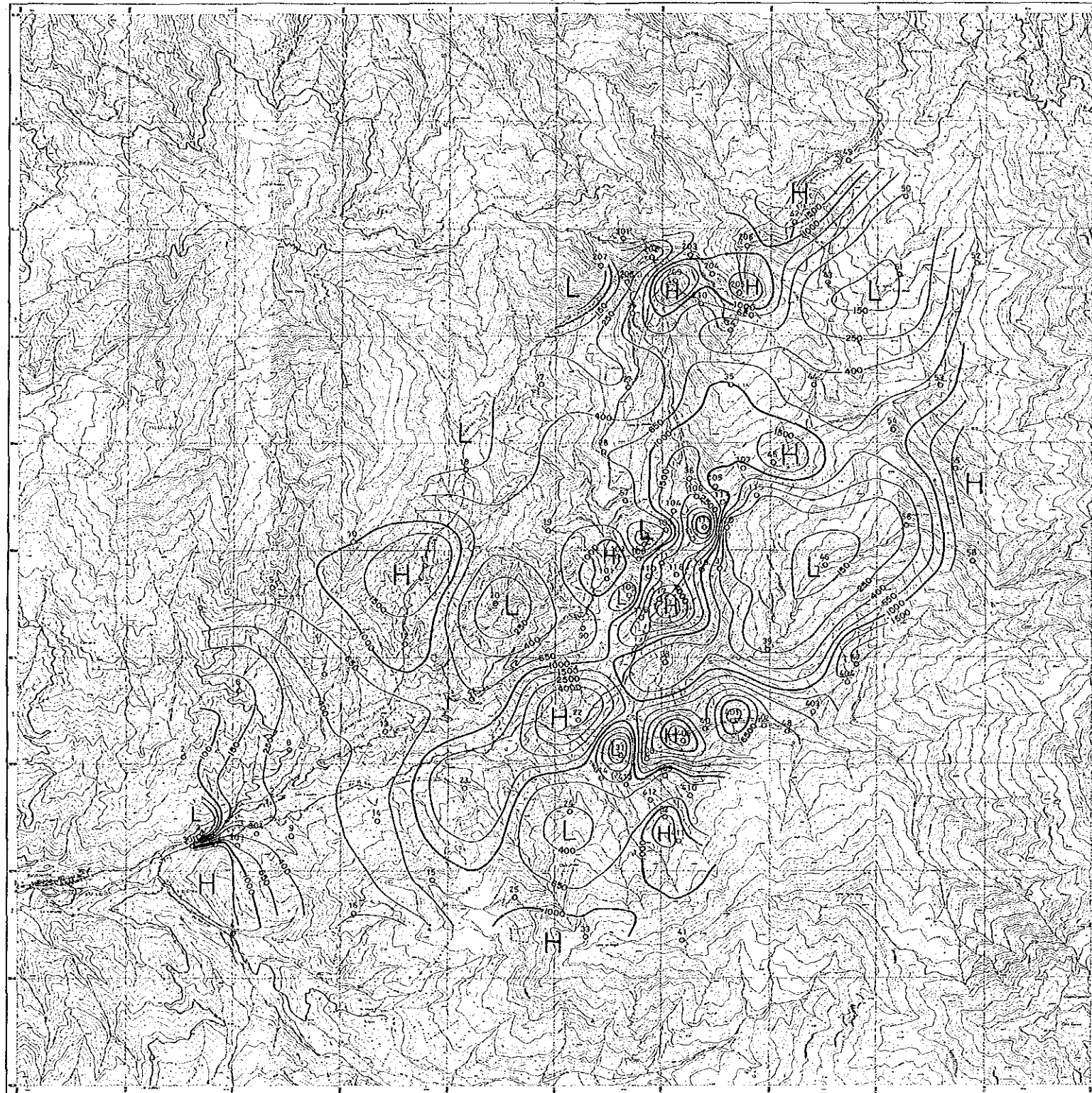


LEGEND

-  Station and No.
-  Apparent Resistivity Contour ( $\Omega \cdot m$ )
- H** High Apparent Resistivity
- L** Low Apparent Resistivity



BALZAPAMBA

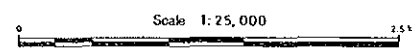


PL. II-1-5



REPORT ON THE MINERAL EXPLORATION  
IN  
THE BOLIVAR AREA, REPUBLIC OF ECUADOR  
PHASE I

Apparent Resistivity Plan Map (1,024Hz)

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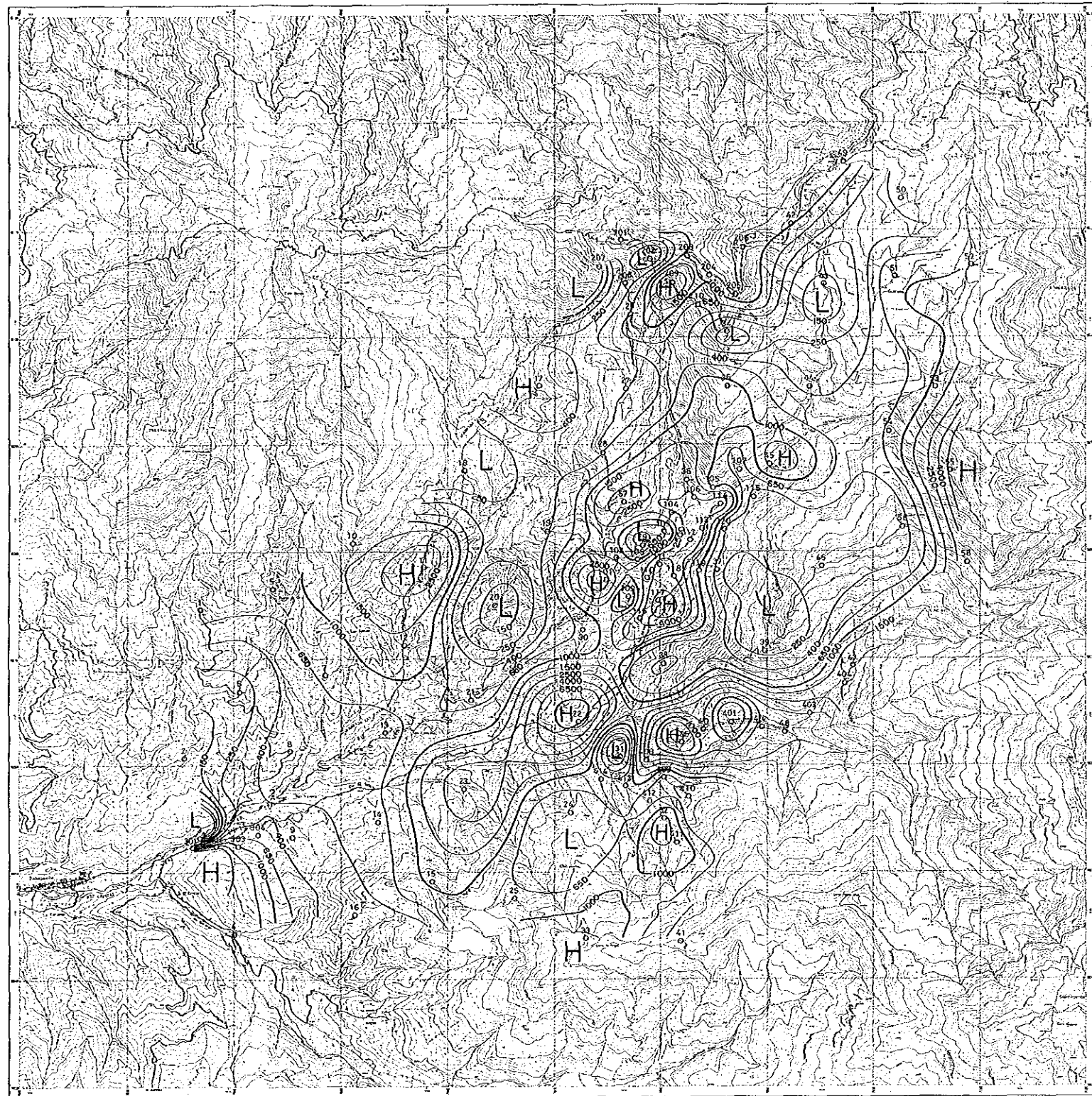


LEGEND

-  Station and No.
-  Apparent Resistivity Contour ( $\Omega\cdot m$ )
- H** High Apparent Resistivity
- L** Low Apparent Resistivity



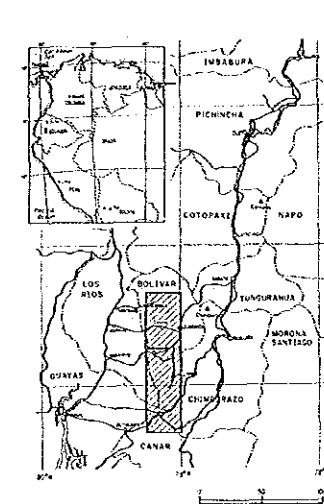
BALZAPAMBA



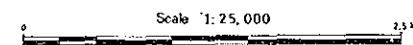
REPORT ON THE MINERAL EXPLORATION  
IN  
THE BOLIVAR AREA, REPUBLIC OF ECUADOR  
PHASE I

PL. II-1-6

Apparent Resistivity Plan Map ( 512Hz)



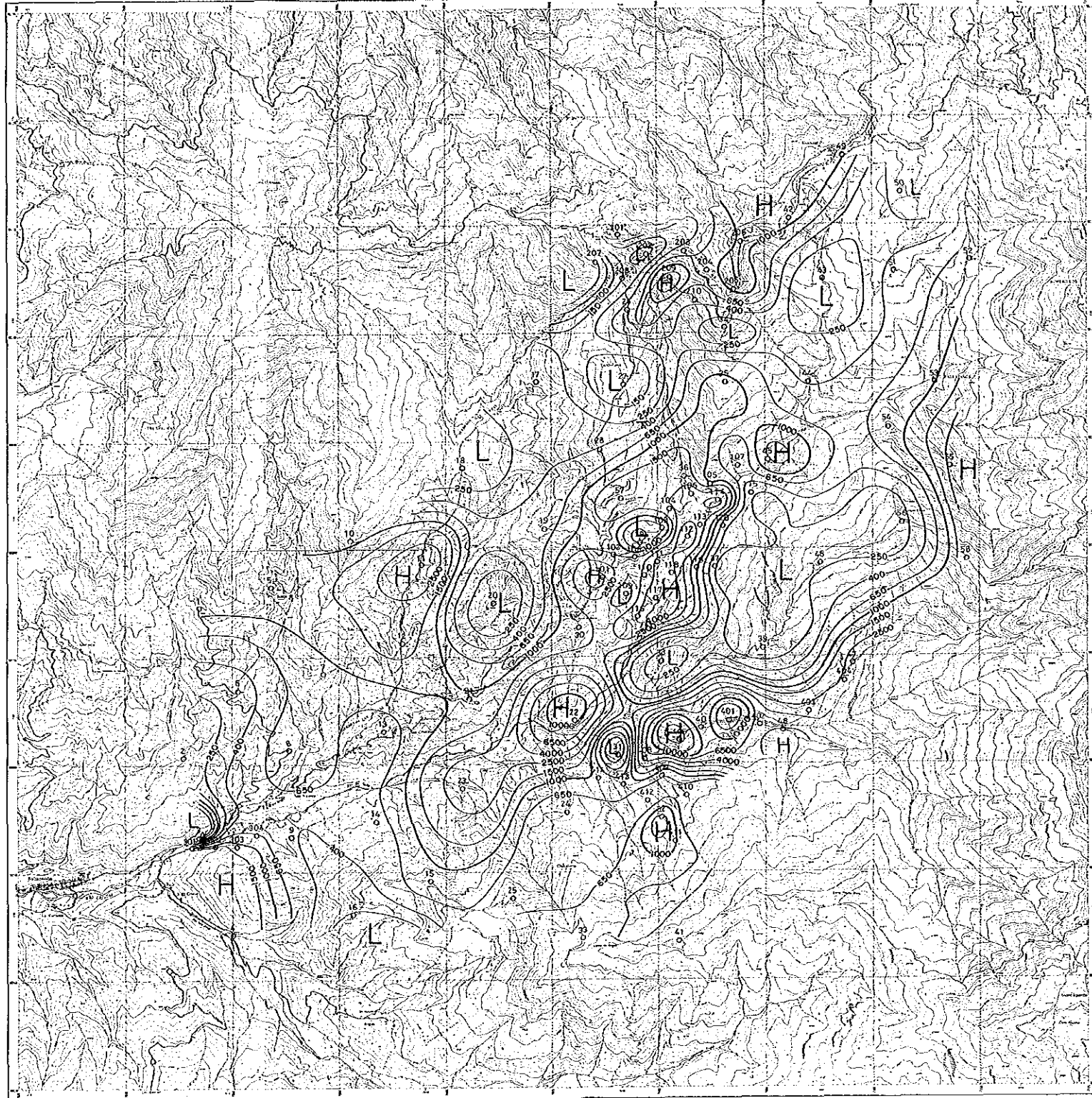
JAPAN INTERNATIONAL COOPERATION AGENCY  
METAL MINING AGENCY OF JAPAN  
FEBRUARY 1989



LEGEND

- 23 Station and No.
- Apparent Resistivity Contour ( $\Omega\cdot m$ )
- H High Apparent Resistivity
- L Low Apparent Resistivity

BALZAPAMBA



PL. II-1-7



REPORT ON THE MINERAL EXPLORATION  
IN  
THE BOLIVAR AREA, REPUBLIC OF ECUADOR  
PHASE I

Apparent Resistivity Plan Map ( 256Hz)

JAPAN INTERNATIONAL COOPERATION AGENCY  
METAL MINING AGENCY OF JAPAN  
FEBRUARY 1989

Scale 1:25,000 2.5 km

LEGEND

-  Station and No.
-  Apparent Resistivity Contour ( $\Omega\cdot m$ )
- H** High Apparent Resistivity
- L** Low Apparent Resistivity