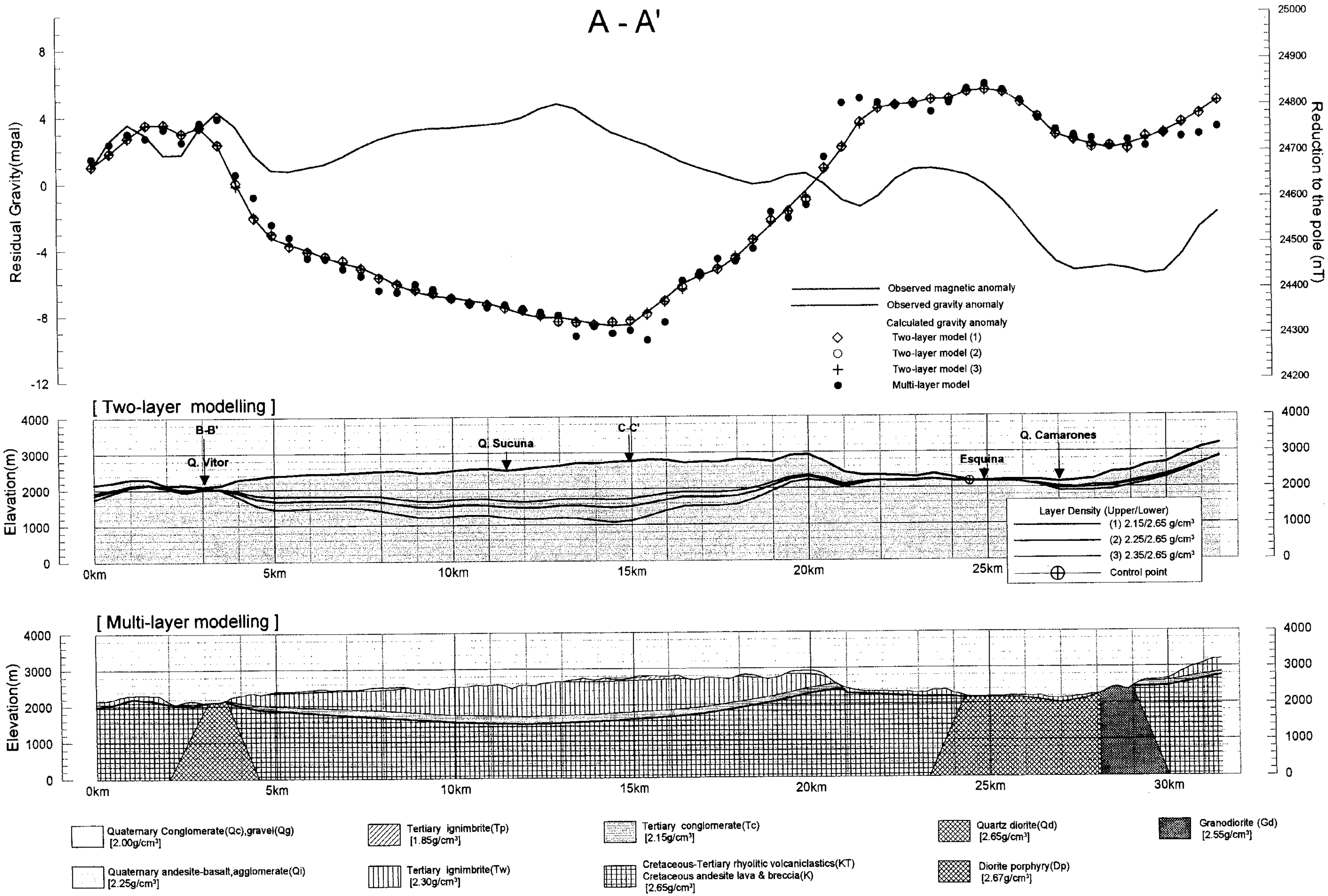

Fig. 2-2-16 Gravity Analysis Profile (A-A')

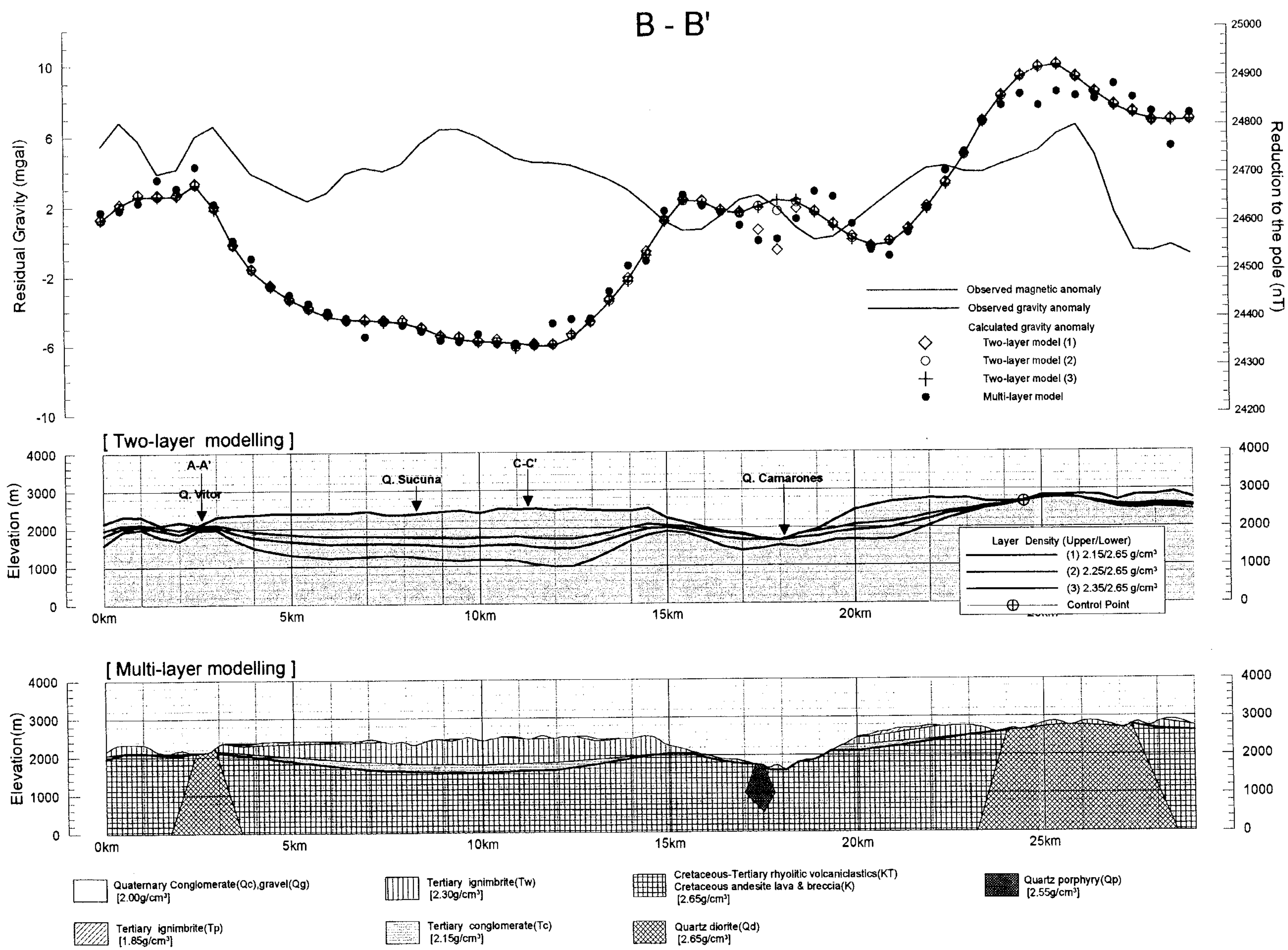

Fig. 2-2-17 Gravity Analysis Profile (B-B')

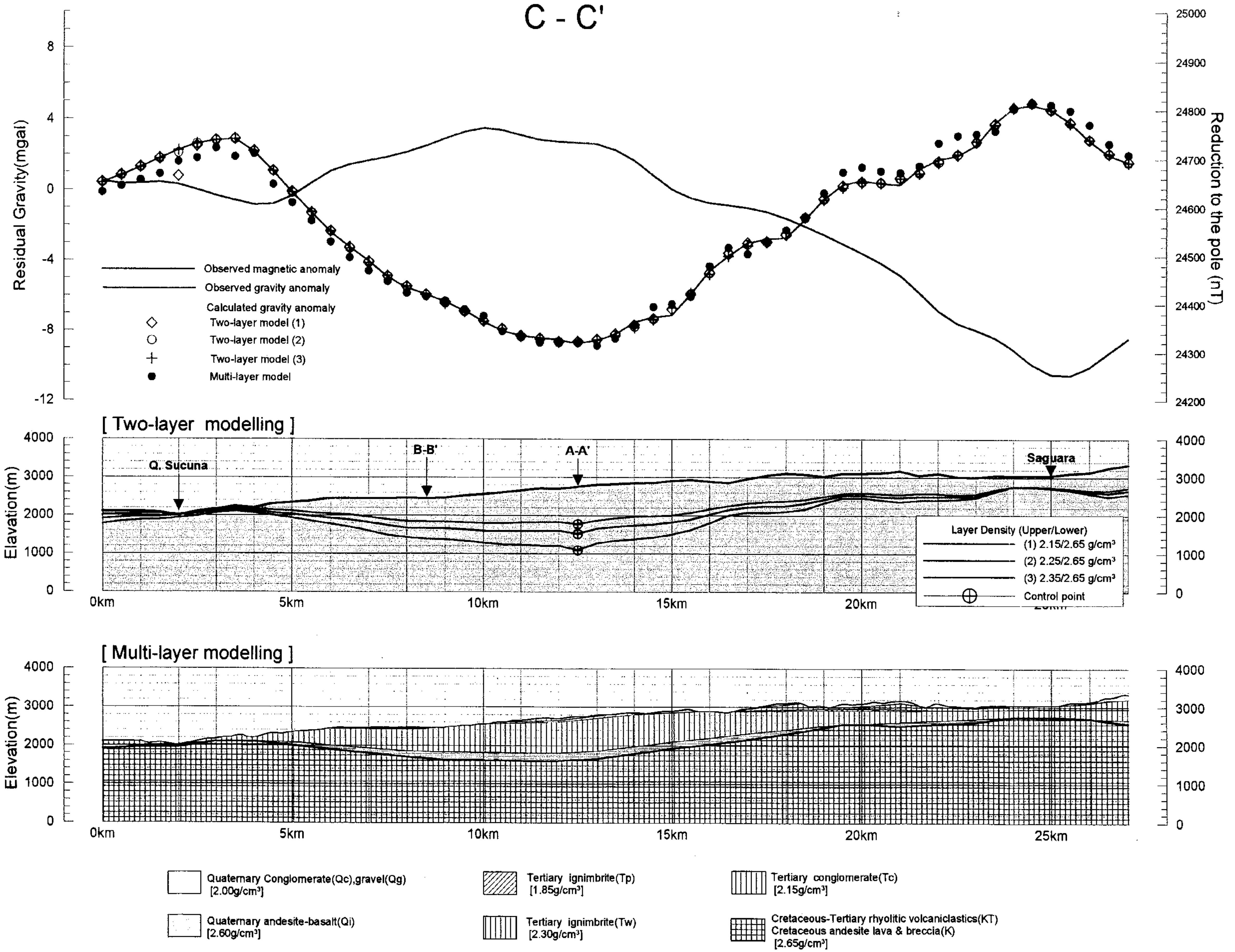

Fig. 2-2-18 Gravity Analysis Profile (C-C')

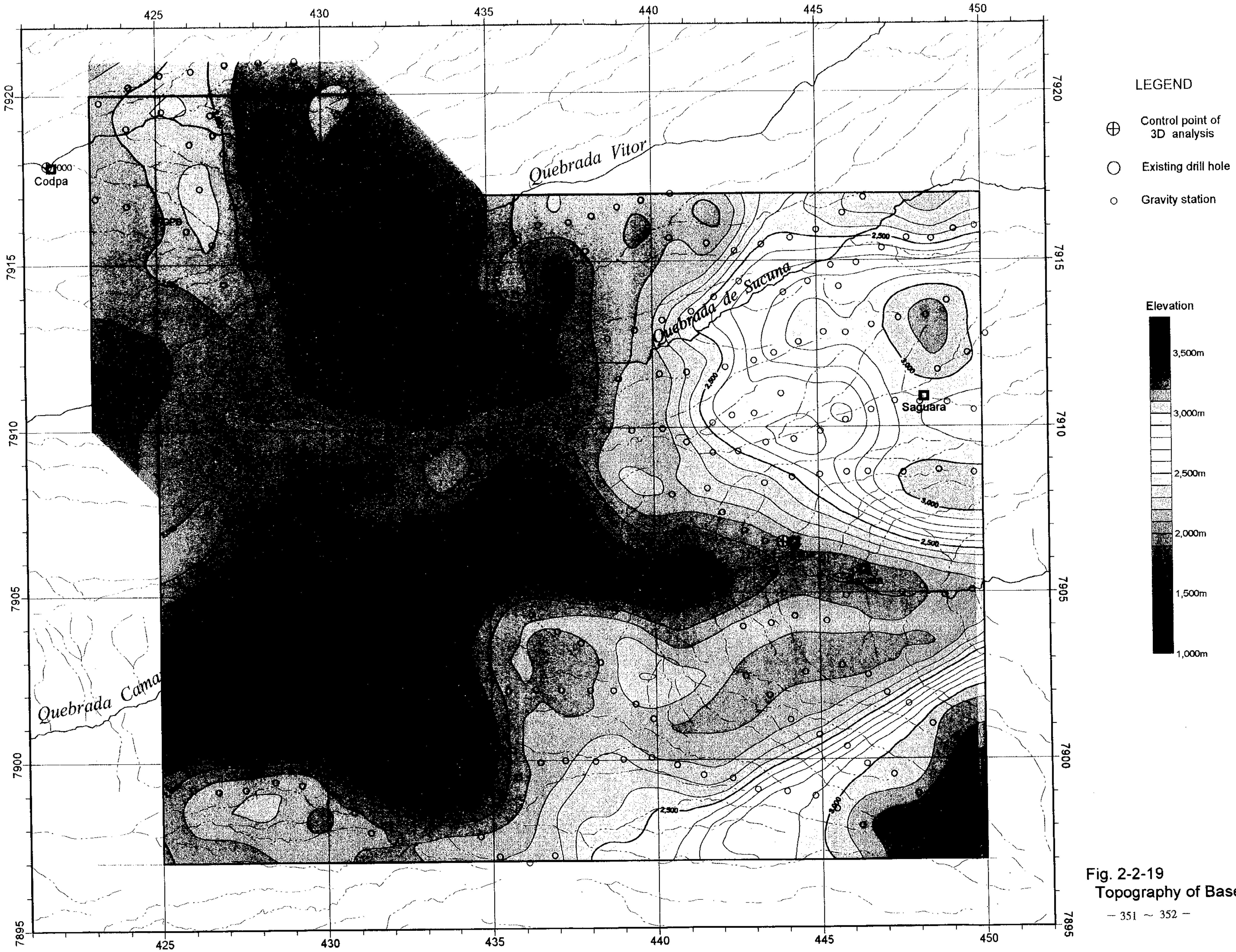

Fig. 2-2-19
Topography of Basement

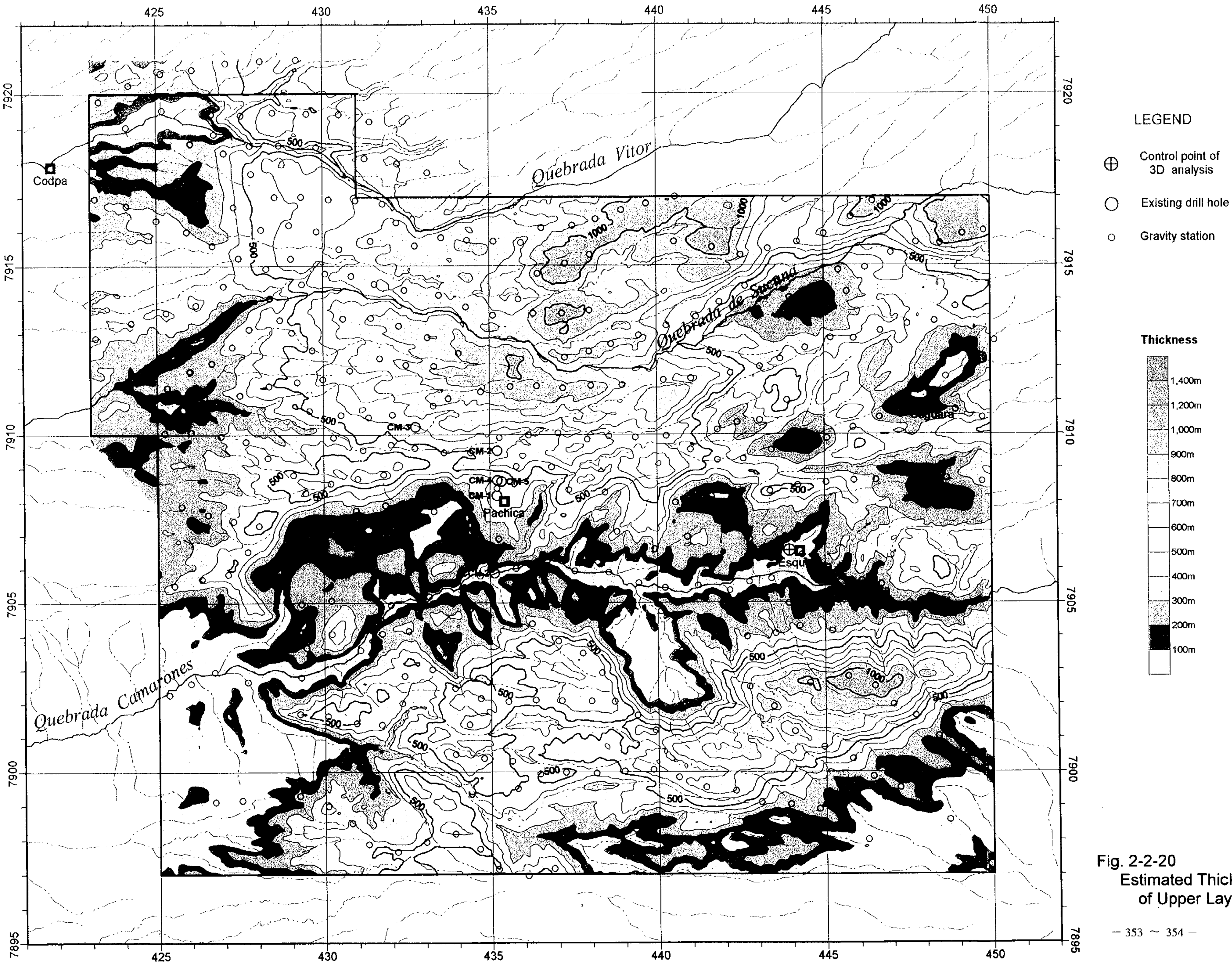

Fig. 2-2-20
Estimated Thickness
of Upper Layer

Comparison of the results of the three-dimensional two-layer modeling and two-dimensional two-layer modeling shows that the three-dimensional modeling results in 100~200m higher at the basement drop in middle Sucuna, about 100m higher near Saguwara in the east, and 300m lower in the high gravity anomaly zone in the southernmost part of the area.

(2) Thickness of the upper layers (volcanic rocks)

Figure 2-2-20 shows the values obtained by subtracting the elevation of the upper surface of the basement laid out in Figure 2-2-19 from the elevation of the surface of the earth, namely the thickness of the upper layer overlying the basement. The upper layer contains conglomerate at the bottom, but most of it is composed of ignimbrite.

It is seen from Figure 2-2-20 that either the upper layer is less than 100m thick or the basement is exposed at; along the Quebrada Camarones, the downstream part of the Quebrada Vitor, near Suguwara in the eastern part, southeastern margin, and other parts of the area. This agrees with actual distribution of the basement rocks in the basin of the Quebrada Camarones, with the exception of the downstream part, and the lower reaches of the Quebrada Vitor. The occurrence of the basement complex is not confirmed in the southeasternmost part of the survey area, but an extensive high gravity anomaly is observed in the southeastern part, and thus the possibility of the occurrence of basement rocks in the shallow subsurface zones is high.

The upper layer is thicker than 500 m at; an extensive zone from middle stream of the Quebrada Sucuna to the middle to upstream part of Quebrada Sucuna, and a belt on the south of the upper stream to middle stream of Quebrada Camarones. There are localities with the upper layer reaching a thickness over 1,000 m from the northern to the northeastern edge with high elevation and in the southeastern part of the area.

2-2-6 Discussions

The results of gravity survey are summarized in figure 2-2-21. In this figure important factors for future exploration in this area are shown. They are; thickness of the upper layer (mainly ignimbrite), elevation of the upper surface of the basement, outline of the gravity distribution, and the extension of intrusive bodies inferred from gravity and magnetic data.

(1) Gravity anomalies and geology

The basement complex of this area occurs extensively from the middle stream to upstream of the Quebrada Camarones, and small exposures are also confirmed in the lower stream of the Quebrada Vitor in the northwestern edge and in the southernmost part. Localities of basement complex occurrence all show high gravity anomalies and close relation between the basement complex and high gravity anomaly has been confirmed. Measurements of rock samples show that the basement rocks have density 0.40g/cm^3 higher than that of the ignimbrite which extensively cover these rocks. Thus the density of the rocks backs the relation between the basement rocks and high gravity anomaly.

The density structure of this area can be basically approximated by two-layer structure, the upper volcanic layer consisting mainly of ignimbrite and the lower basement complex. From the above relation between the high gravity anomaly and the basement rocks, it is inferred that the high gravity anomalies occur where the basement complex is either exposed on the surface or in shallow subsurface zones, namely ignimbrite is either thin or lacking. And low gravity anomalies occur where the basement is relatively deep, namely ignimbrite is thick. Figure 2-2-21 shows that the zone with 300~500m-thick upper layer is the boundary between the high and low gravity anomaly zones.

Cretaceous to Tertiary intrusive bodies are included in the basement complex. Quartz diorite and diorite porphyry, however, have density very close to that of the Upper Cretaceous System which constitutes the main part of the basement. Therefore it is difficult to extract the existence of these two rock types or to consider their subsurface extension by gravity data alone. Quartz porphyry and granodiorite have density 0.10~0.15 g/cm^3 lower than the Upper Cretaceous System and may cause local low gravity anomaly within high anomaly zones. Diorite, on the other hand, has higher density and may cause local high gravity anomaly. However, local anomalies within high gravity anomaly zones could be caused by lower-density ignimbrite or basalt on the surface and the cause can only be determined by correlation with the surface geology. Also many of the intrusive rocks have relatively high magnetism, and the use of magnetic anomaly maps would increase the reliability of interpretation.

(2) Gravity anomalies and magnetic anomalies

It was pointed out in section 2-2-3 that "high gravity – low magnetism" and "low gravity – high magnetism" relation holds for relatively extensive anomalies, and that "high gravity – high magnetism" and "low gravity – low magnetism" relation holds for anomalies of local scale. The "low gravity – high magnetism" relation is observed most clearly in the low gravity anomaly between the middle stream of the Quebrada Sucuna and the middle stream of the Quebrada Vitor. Thick ignimbrite is inferred to occur in this zone from gravity analysis and this ignimbrite is believed to cause the high magnetic anomaly. Generally welded tuff does not have high magnetism, but magnetite content affects the magnetism and this ignimbrite is considered to have high magnetite content.

"High gravity – low magnetism" is typically observed in the eastern part of the survey area where the basement complex is believed to occur in shallow subsurface zones. Upper Cretaceous andesitic rocks generally have high magnetism, but that of the eastern part of this area clearly correspond to low magnetic anomaly. Therefore the Cretaceous System of this area is believed to have low magnetism. The reason for this low magnetism could be; ① magnetism of the Upper Cretaceous rocks is lower than that of ignimbrite, ② the Upper Cretaceous rocks lost their magnetism for some reason, ③ the Upper Cretaceous units have reverse remnant magnetism

"High gravity – high magnetism" is observed in local anomalies at northwest margin of the area, east of Pachica in the central part, near Esquiña, and southern to southernmost part. Intrusive bodies occur in all of the above zones such as; quartz diorite in the northwesternmost and the southern ~ southernmost parts, quartz porphyry at east of Pachica, and diorite porphyry near Esquiña, and these are considered to be the cause of the anomalies.

"Low gravity – low magnetism" is observed at two localities, southeastern part and southern ~ southwestern part on the south of the Quebrada Camarones. The results of gravity analysis (Fig. 2-2-20) indicate the possibility of ignimbrite deposition with thickness of 500~1,000m in these localities. This fact negates the "ignimbrite = high magnetism" mentioned earlier, and indicates the existence of ignimbrite with low magnetism. It is possible that magnetism of ignimbrites varies by sedimentary units, but data on Camarones district alone is insufficient and this needs to be investigated on a larger scale.

(3) Basement structure inferred from the results of gravity analysis

The topography of the basement surface is shown by 100m-interval contour in Figure 2-2-19 and by 200m-contour in Figure 2-2-21. Rise of the basement is seen, in Figure 2-2-19, at two localities, one in the eastern and the other in the southeast to southernmost parts of the area. These two topographic highs are located to the north and south of the Quebrada Camarones and these are considered to have had been a single rise which was subsequently dissected by the Quebrada Camarones. Reconstruction of pre-erosion basement would result in an extensive topographic high exceeding 2,500 m in elevation in the eastern ~ southeastern ~ southern part of the survey area. This basement rises steeply in the southeast direction and drops gently in the W~NW direction. This is a monotonous drop in the westerly direction to about 2,000 m above sea level. Then further westward the basement is almost flat with relatively low relief in the order of 200m and elevation of around 2,000 m. This topography extends in the north ~ northwest ~ western part of the survey area. In parts where the basement is lower than 2,000 m in elevation, ignimbrite thicker than 500 m is probably distributed extensively.

It is noted that the basement surface of Figure 2-2-19 has many steep slopes between 2,300 and 2,700 m in elevation. If these slopes are the products of erosion, it most probably reflects the difference of lithology of the basement. On the other hand, if this is the product of uplift, the steep slopes may reflect the boundary of blocks.

(4) Distribution of intrusive bodies inferred from gravity and magnetic anomalies
Local distribution of high magnetic anomalies is shown in Figure 2-2-21. Of the magnetic anomalies, those corresponding to local high gravity anomalies are; two at the northwestern margin of the area, two in the southern part, and one near Esquiña. Regarding the four magnetic anomalies, excluding the one on the northern side of the northwestern margin, the one on the southern side of the northwestern margin and the two in the southern part correspond to quartz diorite intrusive bodies and the anomaly near Esquiña to diorite porphyry. At the two magnetic anomalies in the northwestern margin, the high gravity anomaly indicates the existence of one large intrusive body. This is a high possibility, and even if there are two bodies, the magnetic anomalies have common features and their depth of occurrence and magnetism are inferred to be similar.

A magnetic anomaly corresponding to a local low gravity anomaly within or near a high gravity anomaly occurs to the east of Pachica in the central part of the area. The low gravity anomaly in this case is a saddle of a high gravity anomaly zone and is not a notable one. Quartz porphyry occurs to the west of the magnetic anomaly and the extension of the magnetic anomaly most probably represents the subsurface distribution of the intrusive body. The density of the quartz porphyry is lower than other rocks of the basement complex, and the above agrees also with the local low gravity anomaly.

Local high magnetic anomalies not associated with gravity anomalies occur at five localities from the northern to the northwestern part of the area. These magnetic anomalies are located in a zone of thick ignimbrite distribution and it cannot represent intrusive bodies in shallow subsurface zones. These anomalies possibly represent the variation of magnetic properties of ignimbrite.

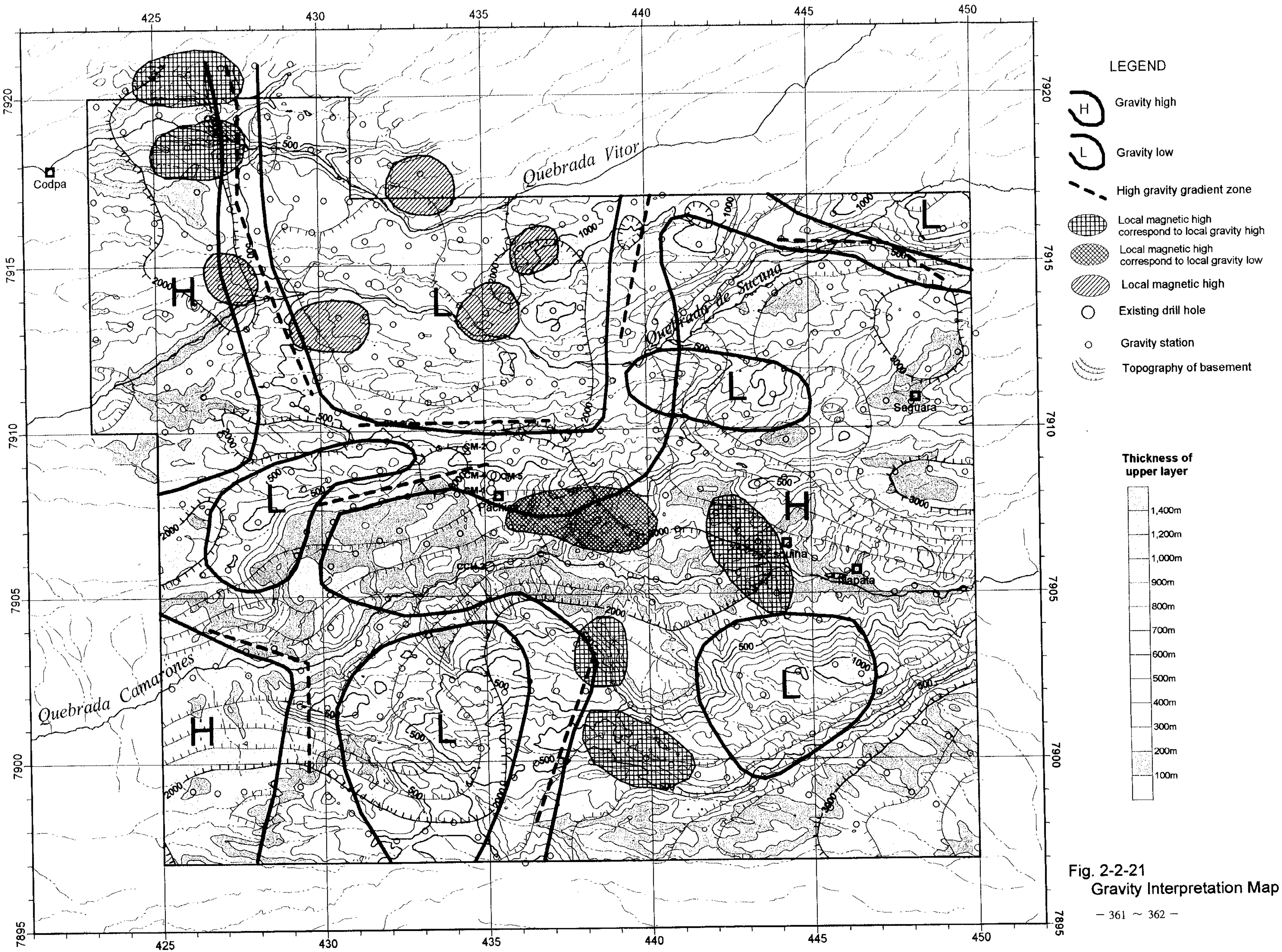

Fig. 2-2-21
Gravity Interpretation Map

CHAPTER 3 AIRBORNE MAGNETIC SURVEY

3 - 1 Survey methods

3-1-1 Field work

(1) Project area

The survey area is shown in Figure 2-3-1. Airborne magnetic data for subareas A and B were newly flown and acquired, data for C was purchased from Fugro Airborne Survey Pty (FAS), and those for D were supplied by CODELCO. Analysis was carried out for all A ~D. Data for C and D were compiled.

(2) Aircraft and base airports

A fixed wing twin engine aircraft (Registration No. C-GGVR) was used for the survey. Specifications are for standard models modified for airborne magnetic survey.

The base airports were Iquique for the southern part of the survey and Alica for the northern part of the survey.

(3) Survey specifications

FAS acquired data for the North Chile Survey using the following parameters. Flight line direction N-S, flight line spacing 500m, tie line spacing 5,000m, tie line direction 90 degrees, total length including tie lines 31,100km.

Sensor height was 100m nominal subject to discretion of the pilot.

(4) Equipment

The following major equipment were used during the airborne data acquisition.

- Magnetometer: CS-2 optically pumped cesium magnetometer
- Navigation equipment: No1Ael 12 channel high speed GPS receiver
- Data acquisition system: Minmag data acquisition

(5) Data acquisition

The following digital data were recorded in magnetic disk. The quality of the acquired data was subsequently checked to see that they satisfied the specifications.

a. Flight time
b. Radar altitude
c. Barometric altitude
d. Magnetometer readings (before compensation)
e. Magnetometer readings (after compensation)
f. GPS readings
g. Develco 3 axes fluxgate magnetometer information
h. Manually inserted information such as flight number and line number.

The resolution of the magnetometer and the GPS data sampling interval were as follows.

a. Magnetometer cycle rate 0.1 seconds
b. Magnetometer resolution 0.001nT
c. GPS cycle rate 1 second

(1) Ground magnetometer
Diurnal magnetic variations and magnetic storm activity were measured with a Gem GS-19 Overhauser proton precession magnetometer or alternative cesium magnetometer. Output was digitally recorded on a PC computer that also recorded GPS time to a precision of 0.005 seconds for synchronization of airborne and ground magnetic data.

The instrument had a resolution of 0.01nT, a noise envelope of better than +/−0.1 nT and digital output was provided and recorded once every 2 seconds or less. Longer sampling times reduced the noise envelope.

The base station magnetic monitors (cesium optical pumping magnetometer) were located at about 10km north of Iquique airport and at near the Alica airport.

3-1-2 Data processing

1) The acquired data were checked for noise level and flight path, and then sent to the Fugro office in Perth. There magnetic diurnal variation, level, and other relevant processing was made. They were converted to gridded data and the following magnetic maps and images were prepared. Maps were projected in Universal Transverse Mercator (UTM) Zone 19 using WGS 84 datum. Maps were plotted at an appropriate scale, showing UTM and graticular coordinates and were produced on the HP650c Designjet plotter using a stable Mylar base or paper.
    - Final flight path map
    - Final color contour map TMI/RTP
    - Final color TMI/1VD image
    - Final greyscale TMI/1DV image
    - Stacked profiles of TMI
    - Final colored DTM (digital terrain model) image

Final gridded and located digital data were provided in ER Mapper/Surfer/format on CD-ROM consisting of:

- Corrected TMI
- Corrected TMI/RTP
- Corrected TMI/1VD

The raw data were supplied on CD-ROM as located data in ASCII format containing the following information. Line number, flight number, date, time, fiducial number, UTM coordinates, total magnetic intensity value, magnetic diurnal value, IGRF, radar altimeter reading, barometric altimeter reading, GPS, Digital terrain.

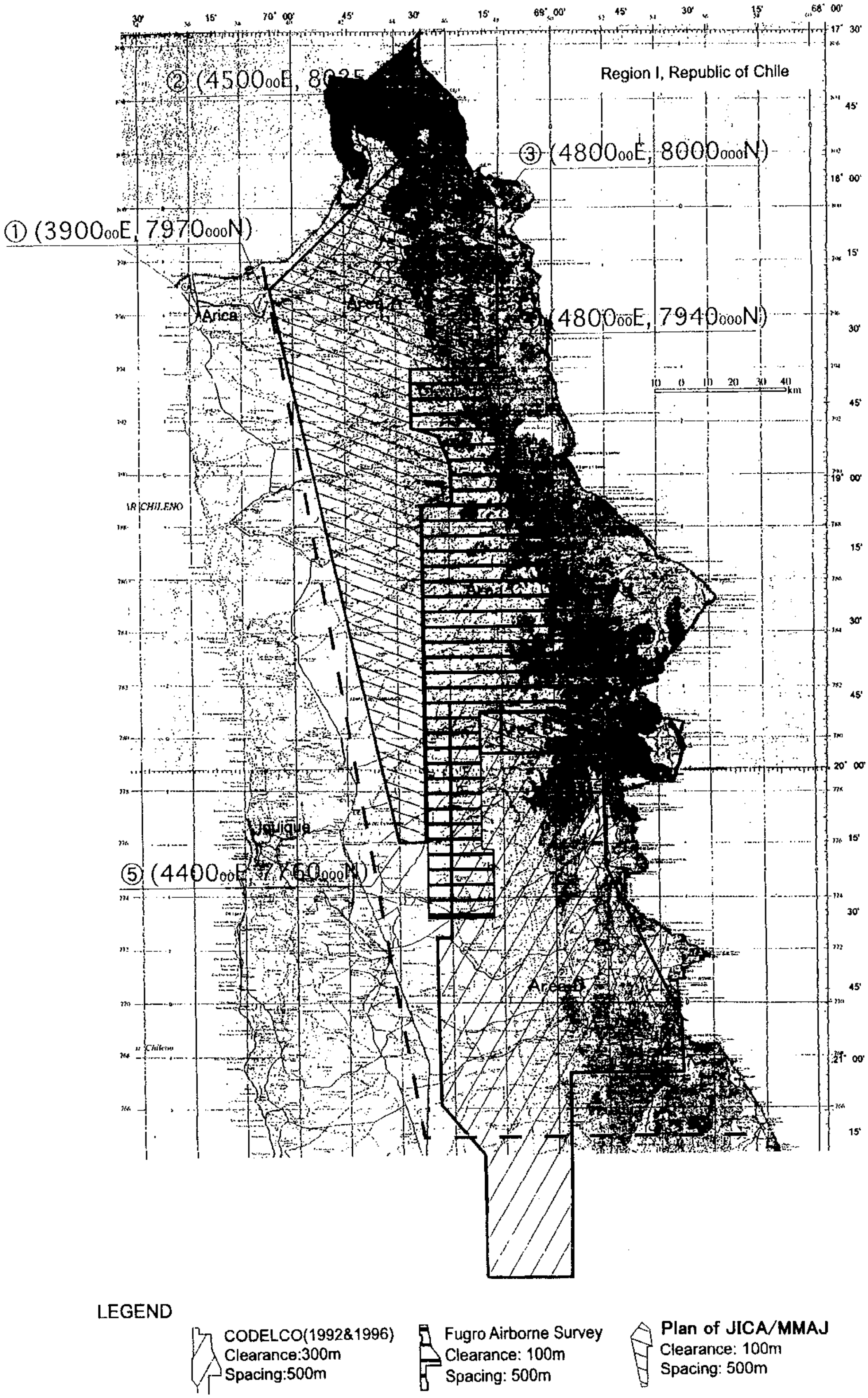

Fig.2-3-1 Survey Area of Airborne Magnetic Survry

3-1-3 Interpretation

The magnetic data were qualitatively analyzed using a methodology based on that outlined by Isles et al. (2000), and Nash & Rankin (1994). This is typically a multi-stage (and multi-level) process involving:

a. Extraction of the position of shallow magnetic units.

b. Extraction of magnetic trend and distribution caused by rock distribution, alteration, and relevant factors.

c. Extraction of deeper concealed magnetic rock bodies or structures from lower frequency magnetic signals. The position and shape of such bodies are generally more subjective than those of shallow zones, as resolution of magnetic sources decreases with increasing distance between source and sensor.

d. Geologic contacts, fault/shears are compiled by recognition of changes in magnetic character or texture between differing units or domains. And angular discordance, breaks or inflexions between and along major magnetic units. Both major and minor faults/shears are interpreted from:

- overall distribution of magnetic trends and units
- direct observation of magnetic anomalies associated with the structure and
- profile modeling of magnetic signals.

The resulting structural framework was compared with GIS data set of the published geological maps and also with JICA/MMAJ Landsat interpretation (JICA, 2000). Although the majority of structure interpreted from the magnetic data was found to have a high degree of correlation with the published mapping, several differences were apparent in differing zones:

a. Some faults mapped on the surface were not evident in the data.

b. Faults mapped at the surface were close to but not coincident with faults interpreted from the magnetic data.

c. Faults interpreted from the magnetic data were not recorded in zones of outcrops in the published maps.

Many of the faults recorded in the published maps appear as late-stage normal faults cross-cutting the overall N-S structure grain of the region. Where these have only minor movement, or occur in magnetically quiet regions, their expression in the magnetic data is generally ambiguous. N-S trending structural elements are commonly difficult to detect in the magnetic data, as they parallel the flight lines of the magnetic surveys. This problem has also been noted in other regional interpretations of magnetic data-sets within the Andean belt (eg. Chernikoff et al., 1996, Rankin & Triggs, 1997).

Resolution of structures parallel to the flight line direction increases with closer line spacing. Numerous structures recorded within the published maps were integrated with magnetic interpretation.

- Detailed interpretation of the Camarones district

Detailed structural interpretation was carried out for the Camarones district shown in the following figure 2-3-2.

• Two-dimensional modeling of target profiles
Three promising target zones have been profiled using two-dimensional modeling. The target zones are two profiles in the Camarones district and one in the Escondida district.

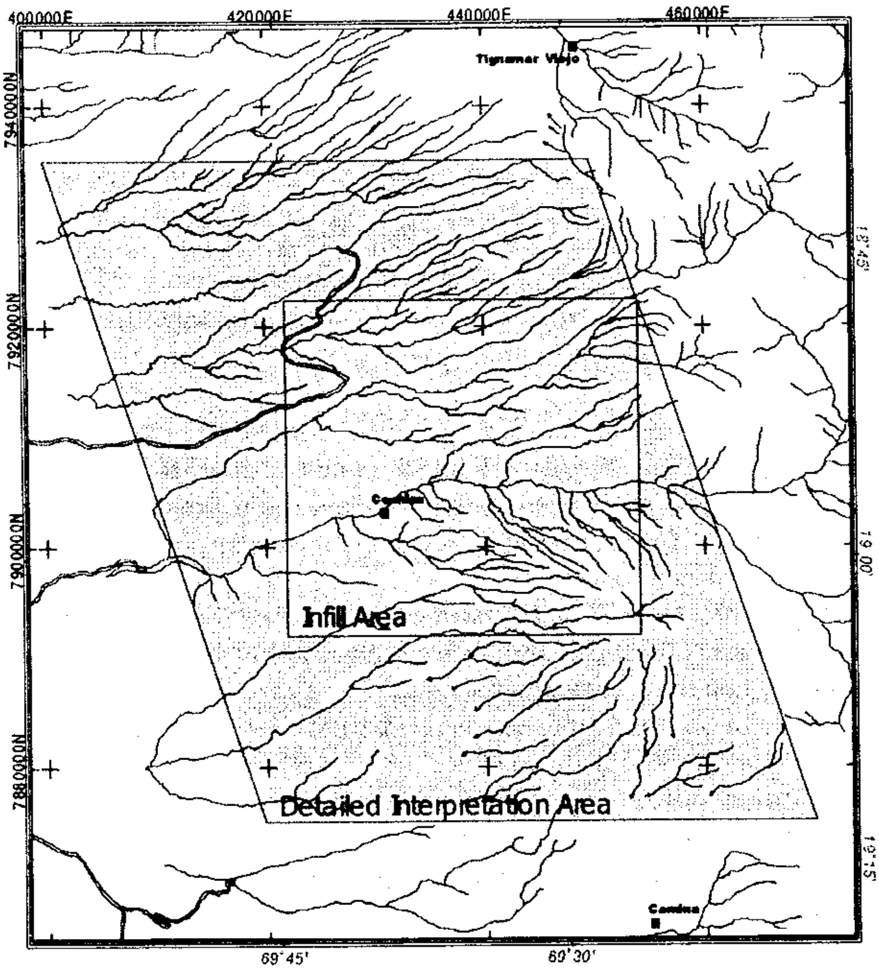

Fig. 2-3-2. Location of the detailed 1:100 000 'solid geology' interpretation area

3 - 2 Results of survey

Interpretation of airborne magnetic data from the Northern Chile Region I has focussed on providing:

a. a structural view of the regional geologic framework for the Andean Belt;
b. a detailed geological interpretation of a key target area (Camarones district) by the Metal Mining Agency of Japan;
c. a quantitative geophysical analysis of depth to basement and 2-dimensional modeling of selected target profiles.

The magnetic data was a combined stitch of existing multiclient data (supplied by Fugro Airborne Surveys), and proprietary data (supplied by CODELCO), plus newly acquired data.

3-2-1 Regional structural framework

This interpretation emphasizes the primary underlying structural features controlling distribution of the various litho-tectonic suites throughout the region, and their role in focussing both magnetic and mineralizing events (at the expense of detailed interpretation of surficial or near surface lithologies).

The tectonic overview highlights the subdivision of the region into several subdomains: a regional migration of magmatic activity can be traced east to west. The western Cretaceous La Negra / Coastal Batholith magmatic arc was superseded by the interpreted Paleocene Tarapaca Back Arc magmatic belt. Further east, the deformed Mesozoic sediment / volcanic sequences and eastern Paleozoic basement were intrud3ed by early-middle Tertiary intrusives (porphyry-related). These were superseded by a weakly-discordant series of Mid-Tertiary to Recent volcanic centers trending NNW. The main Early Tertiary intrusive complexes also follow a NNW discordant structural trend.

The various subdomains define a roughly N-S regional grain for the Andean Belt, with a significant bend towards the NNW north of ~20° S (coincident with Tertiary-Quaternary magmatism).

Several major NE, NE, and E-W transfer fault zones or corridors are highlighted in the regioal structure. These have been active during several deformational episodes, and have played a major role in focusing both mineralized porphyry and epithermal systems within this region, and throughout the rest of the Andean Belt.

The northern continuation of several crustal-scale orogen - parallel fault systems associated with major mineralization throughout Central and Northern Chile have been interpreted from the magnetic data, including the Domeyko Fault System (DFS). This structure is related to the western fault margin of Paleozoic basement, and is the regional structural locus for the giant copper porphyries at Escondida, El Salvador, Chuquicamata, Collahuasi, Quebrada Blanca, and others.

A series of subvolcanic intrusive and caldera structures have also been interpreted from the data. Many of these are coincident with both known mineralization and regional structures.

A series of target zones have been selected for both porphyry copper and epithermal / volcanic dome related Au/Ag mineralization. These targets are based on associations of confluence of regional structures, localized and regional magnetic characteristics, and distribution of known mineralization.

The most prospective exploration districts occur within four significant zones, spaced approximately 80km apart, along a subtle NNW trending structural corridor (these include the districts hosting Collahuasi and Cerro Colorado).

3-2-2 Detailed solid geology interpretation

A detailed solid geology interpretation, emphasizing the local relationships of near-surface lithology to the regional structure and underpinning intrusives, has been completed over a specified area of approximately 60km×60km. This area covers one of the four significant exploration districts mentioned above. Two main target zones have been identified, within which are contained several discrete magnetic anomalies for follow-up work.

3-2-3 Two dimensional modeling of target profiles

Three of the most promising target zones have been profiled using two-dimensional geophysical modeling. The first two profiles cover the perceived best magnetic anomaly from each of the two primary target zones identified in the detailed solid geology interpretation. The third, identified in the regional structural interpretation, has been positioned over a zone exhibiting similar overall tectonic and magnetic features to that of the Escondida area.

3-2-4 Depth to magnetic source analysis map

A regional study has been undertaken across the entire North Chilean airborne magnetic data set, to determine the depth to the source of significant tectonic structures. The technique used to determine depths in this study was the Werner method. Final solutions have been presented as both spot depths and gradient contours.

The depth solutions derived from the Werner process were shown to fall into three fairly distinct regions which coincided well with the regional tectonic framework. The deeper solutions (>800m) are shown to concentrate in the middle of the data set, within the Trapaca Back Arc Magmatic Belt. A slightly shallower group (600~800m) corresponding to the Coastal Batholith tectonic subdomains, lie to the west of the Tarapaca Belt. On the east side of the data set, beyond the interpreted extension of the Domeyko Fault System, the depth solution rise to an average of 400m. This corresponds to the Paleozoic basement subdomains identified in the regional interpretation.

PART III CONCLUSIONS AND RECOMMENDATIONS

PART Ⅲ CONCLUSIONS AND RECOMMENDATIONS

CHAPTER 1 CONCLUSIONS

The following results were obtained from the geological・geochemical survey, gravity survey, and airborne magnetic survey carried out during the second year of the project in the Region I.

Geological survey・geochemical survey

Ground truth and reconnaissance surveys were carried out during the first and second year at four localities each year, a total of eight localities. These localities were extracted as promising for locating mineral deposit by analyses of existing data, satellite images, and other relevant information. These surveys confirmed that the localities with geologic characteristics of porphyry copper mineralization and mineral potential are; Mocha-Soledad district, La Planada district, Queen Elizabeth district, Tignamar district, Camarones district, and Diana district (Fig. 1-4-2). Drilling in parts of the Mocha-Soledad, Tignamar, and Camarones district discovered porphyry copper-type secondary enrichment zones. Of these districts, most potential localities, from the intensity of Cu-Mo mineralization, are concluded to be the Queen Elizabeth and La Planada districts.

In the Mocha-Soledad district, there is a possibility of porphyry copper deposit occurrence at northeastern Mocha and between eastern Mocha and Soledad aside from the deposits confirmed in the Mocha district.

In the Tignamar district, there are alteration zones at two locations, namely in the northern and southern parts. The occurrence of porphyry-type mineralization has already been confirmed on the northern side of the northern part of the district. And although there are room for further exploration outside the drilled zones, there are negative factors regarding the further development of porphyry-type-mineralized zone such as propylitic alteration and the possibility of dominant epithermal-type mineralization. In the southern side of the northern part, there are wide occurrences of altered zones, which could not be surveyed this year, and there are rooms for further exploratory work, but the topography is rugged and the access is difficult.

In the Camarones district, a regional hydrothermal alteration zone was confirmed between the Quebrada Camarones and the southernmost part of the survey area. This regional alteration zone is believed to have been formed by a series of hydrothermal activity from porphyry copper-type to epithermal-type activity. The location of the center of this activity, namely the porphyry copper zone, was inferred from the study of annular structure, distribution of intrusive bodies, fluid inclusion data, geochemical anomalies, high magnetic anomalies, gravity anomalies, and other relevant data. The known copper mineralization in quartz porphyry host rock could possibly be a peripheral phase of this porphyry copper mineralization.

In the Diana district, the alteration zone is similar to the Au-rich mineralization・alteration zone formed above porphyry copper deposits. Thus there is a possibility of porphyry copper deposit occurrence in subsurface zones.

Localities other than those mentioned above are either poor in porphyry copper-type indications or weak in mineralization and the porphyry copper potential is low.

Gravity survey

High gravity anomaly occurs in the following localities; extensive area from the eastern to southeastern and southern part of the Camarones district, western margin of the survey area, and from middle stream of Quebrada Camarones to the west of Pachica. On the other hand, low gravity anomaly occurs in; wide area from the middle stream of Quebrada Vitor to the middle stream of Quebrada Sucuna in the northern part of the survey area, southern bank of the Quebrada Camarones in the southwest, and upstream Quebrada Sucuna in the northeastern margin.

The drainage zone of the Quebrada Camarones is in high gravity zone with the exception of a part of the southwest. The low gravity anomaly zone at the middle stream of Quebrada Vitor to Quebrada Sucuna has relatively high gravity at its eastern, southern, and western border and has a clear outline.

Basement complex in the Camarones district is closely related to high gravity anomaly. This is evidenced by the high density, 2.50~2.80g/cm^3, of the rock samples. The high gravity anomalies indicate either surface exposure of the basement complex or its occurrence in shallow subsurface zones, namely either the lack or thin ignimbrite cover. On the other hand, the low gravity anomalies indicate deep basement complex and thick overlying ignimbrite. Three-dimensional two-layer modeling results show that the thickness of the ignimbrite cover is more than 500m at the extensive zone from the middle stream of

Quebrada Sucuna to middle to upstream of Quebrada Vitor, and a belt on the southern bank of the upstream to middle reaches of Quebrada Camarones. It is estimated that the thickness would attain more than 1,000m in the high elevation zone in the northern to northeastern part and in the southeastern part of the survey area.

Extensive subsurface occurrence of intrusive bodies is inferred form the distribution of the high gravity anomalies and magnetic anomalies at; southern part of the survey area, near Esquiña in the central part, and east of Pachica. Parts of the intrusive bodies are exposed on the surface, and the overlying volcanic rocks are estimated to be less than 200~300m thick. These zones should be considered for future exploration. Results of analysis indicate that the basement complex occurs in shallow subsurface zones at; near Saguara in the east, downstream zone of the Quebrada Sucuna in the west, and downstream zone of the Quebrada Camarones. Notable magnetic anomalies, however, were not detected in these localities.

Airborne magnetic survey

Subsurface geologic structure of the whole survey area was clarified by magnetic analysis, and the northern continuity of the fault system related to mineralization was confirmed. An example would be the Domeyko Fault.

The structure of the subsurface intrusive bodies and calderas were inferred from magnetic data and these are harmonious with the known mineralized zones and regional geologic structure.

Areas with possibility of the occurrence of porphyry copper mineralization or Au/Ag-bearing epithermal mineralized zones/volcanic domes were extracted from the examination of regional geologic structure from magnetic analysis, local and regional magnetic characteristics, and the distribution of the known mineralized zones (Fig. 1-4-2).

CHAPTER 2 RECOMMENDATIONS FOR THE THIRD YEAR

1. Extract promising areas by comprehensive examination of ; the results of the airborne magnetic survey and the results of various surveys already carried out. And carry out ground truth survey of the extracted promising areas. This ground truth survey will verify the results of the airborne magnetic survey and will enable the extraction of areas for detailed survey.

2. Carry out gravity survey and other relevant work of areas where concealed mineralized zone is anticipated. These areas are within the promising areas mentioned above (1). These work will verify the results of the airborne magnetic survey and will enable the extraction of areas for detailed survey.

3. Examine the feasibility of drilling for subsurface porphyry copper deposits inferred to occur in the Camarones district.

4. Examine the necessity of detailed geological survey, geochemical survey, and gravity survey of areas where Corporacción Nacional del Cobre de Chile (CODELCO) holds concession. These are within the high porphyry copper potential localities (Mocha-Soledad, La Planada, Queen Elizabeth, Tignamar, and Diana) delineated by the ground truth survey of the first and second year.

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PHOTOGRAPHS

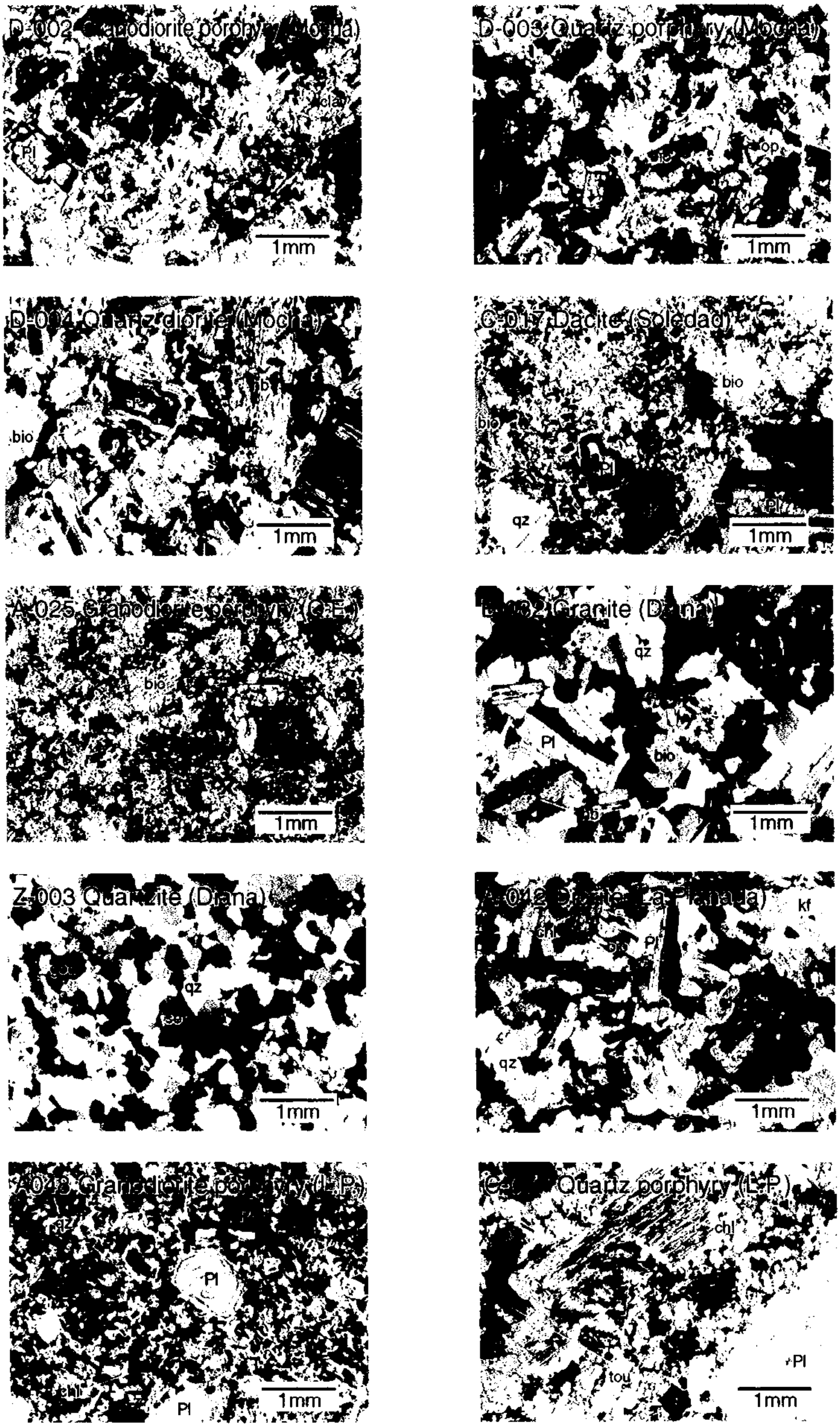


Photo 1 Photomicrographs of Thin Sections (Phase 1)

Abbr. Q.E. = Queen Elizabeth

L.P. = La Planada

refer AP-2 (1)

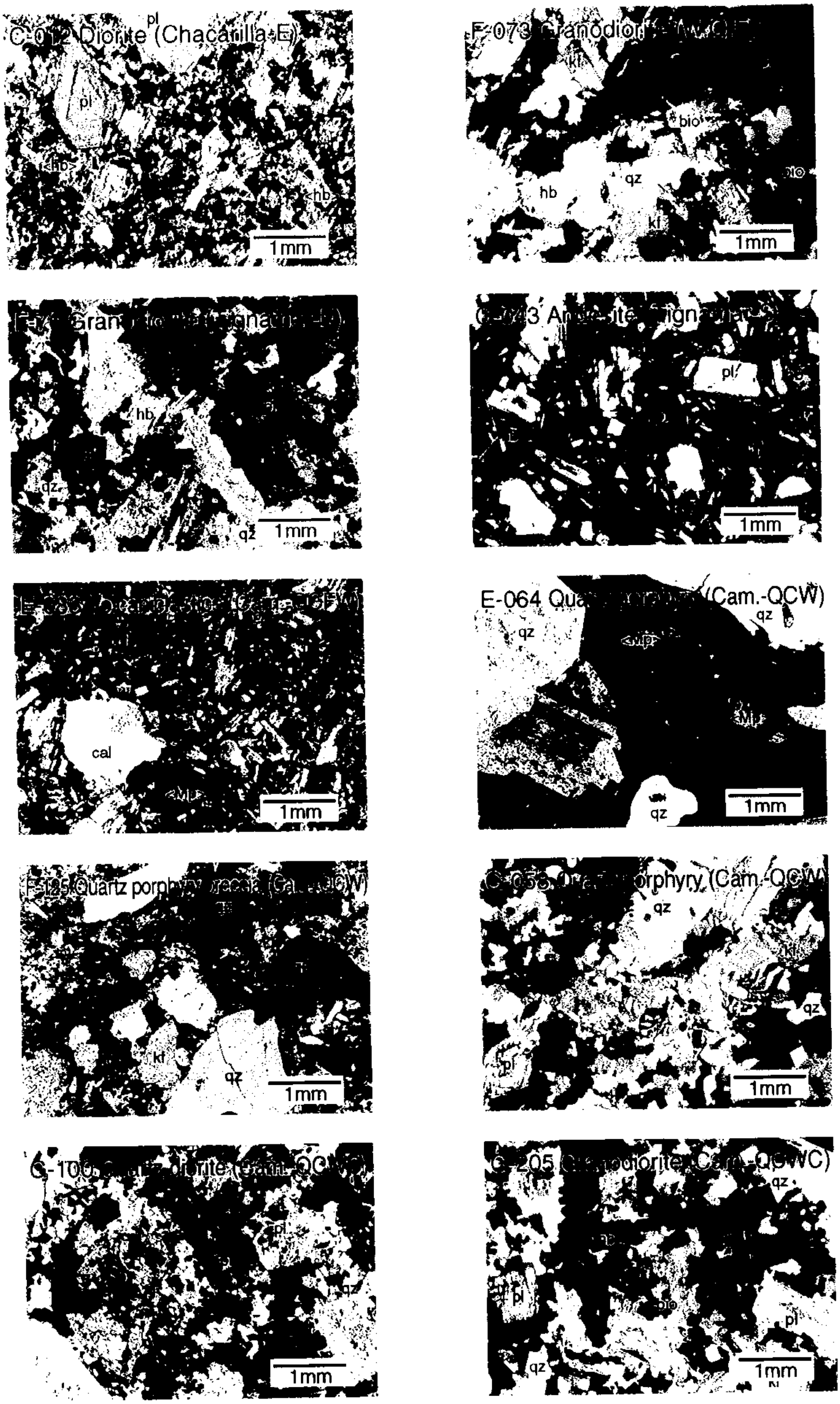
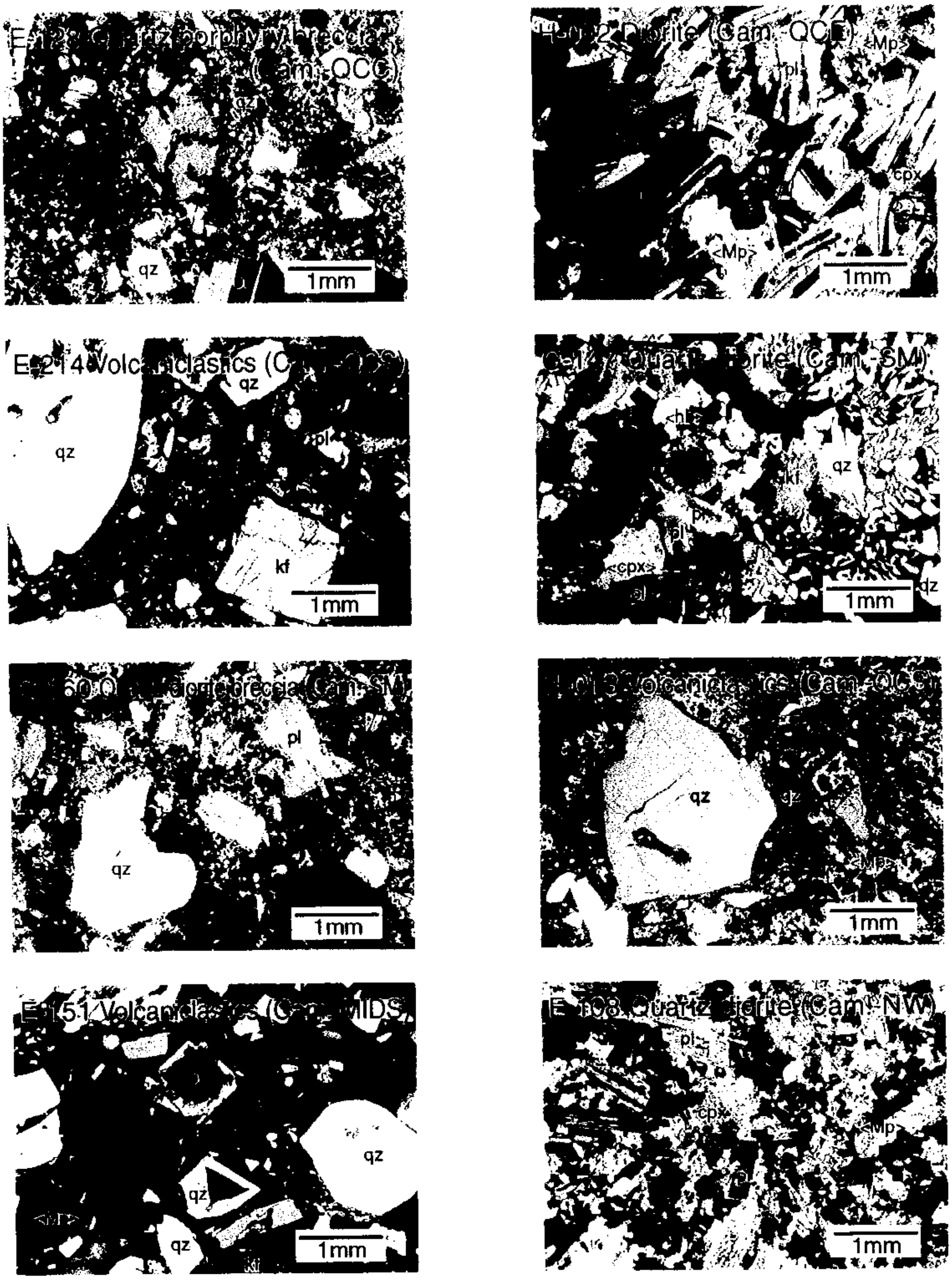


Photo 2 Photomicrographs of Thin Sections (Phase 2)
Abbr. W.Q.E. = West Queen Elizabeth
Cam = Camarones
refer AP-2 (2)



Abbr.

QC = Quebrada Camarones
FW = far west
W = western mineralization zone
C = central mineralization zone
E = eastern mineralization zone
SM = southernmost
MIDS = midsouth
NW = northwest

Photo 3 Photomicrographs of Thin Sections (Phase 2)

refer AP-2 (2)

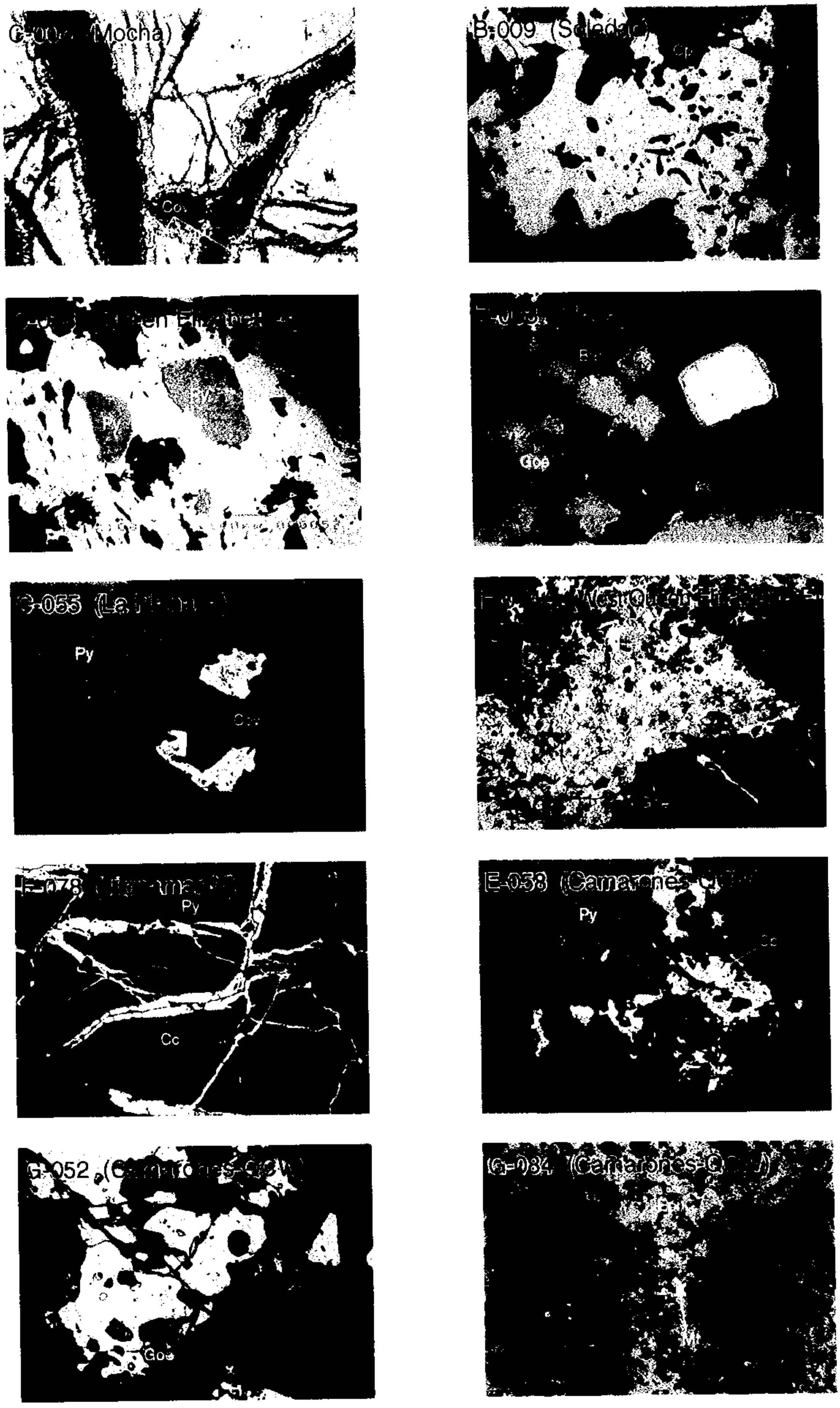
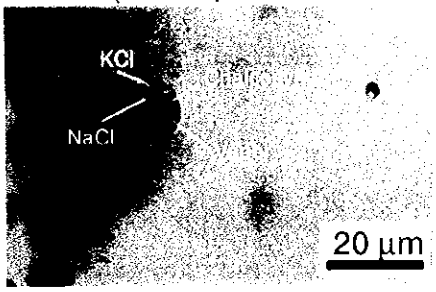


Photo 4 Photomicrographs of Polishes Sections (Phase 1, 2)
refer AP-3

C-006 (Mocha)



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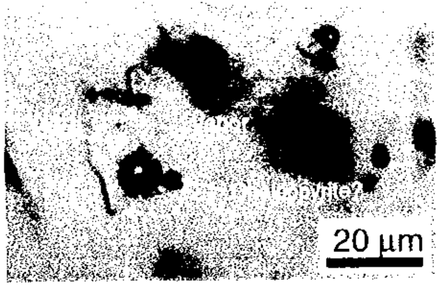

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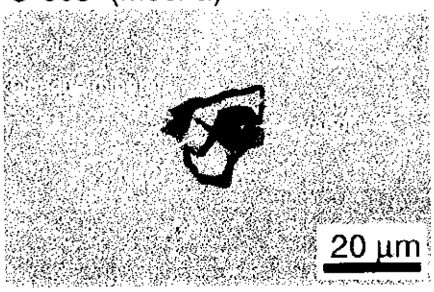

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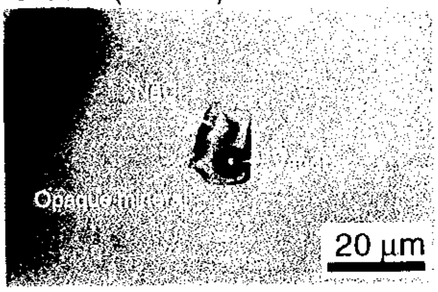

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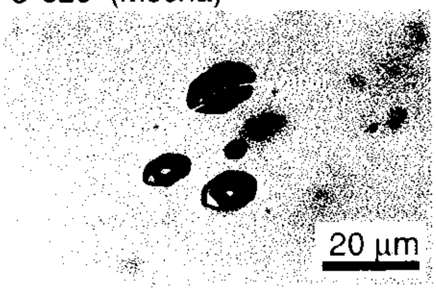
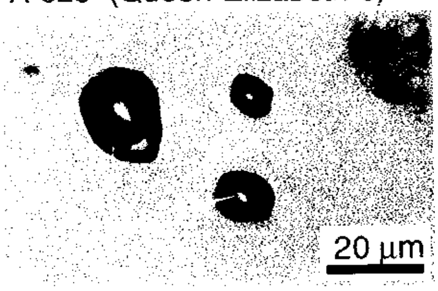
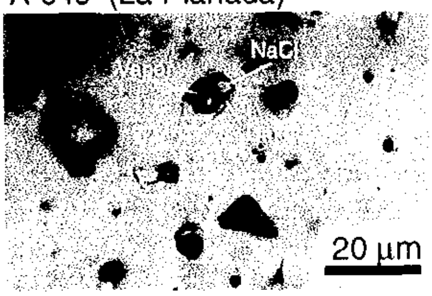


A-028 (Queen Elizabeth-s)



A-049 (La Planada)



C-073 (La Planada)

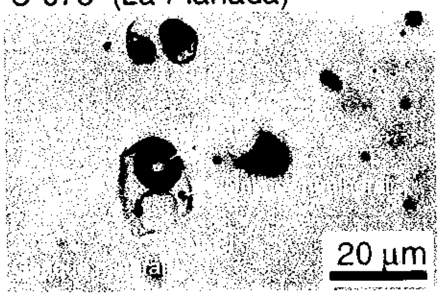


Photo 5 Photomicrographs Showing Fluid Inclusion Textures (Phase 1)

refer AP-5 (1)

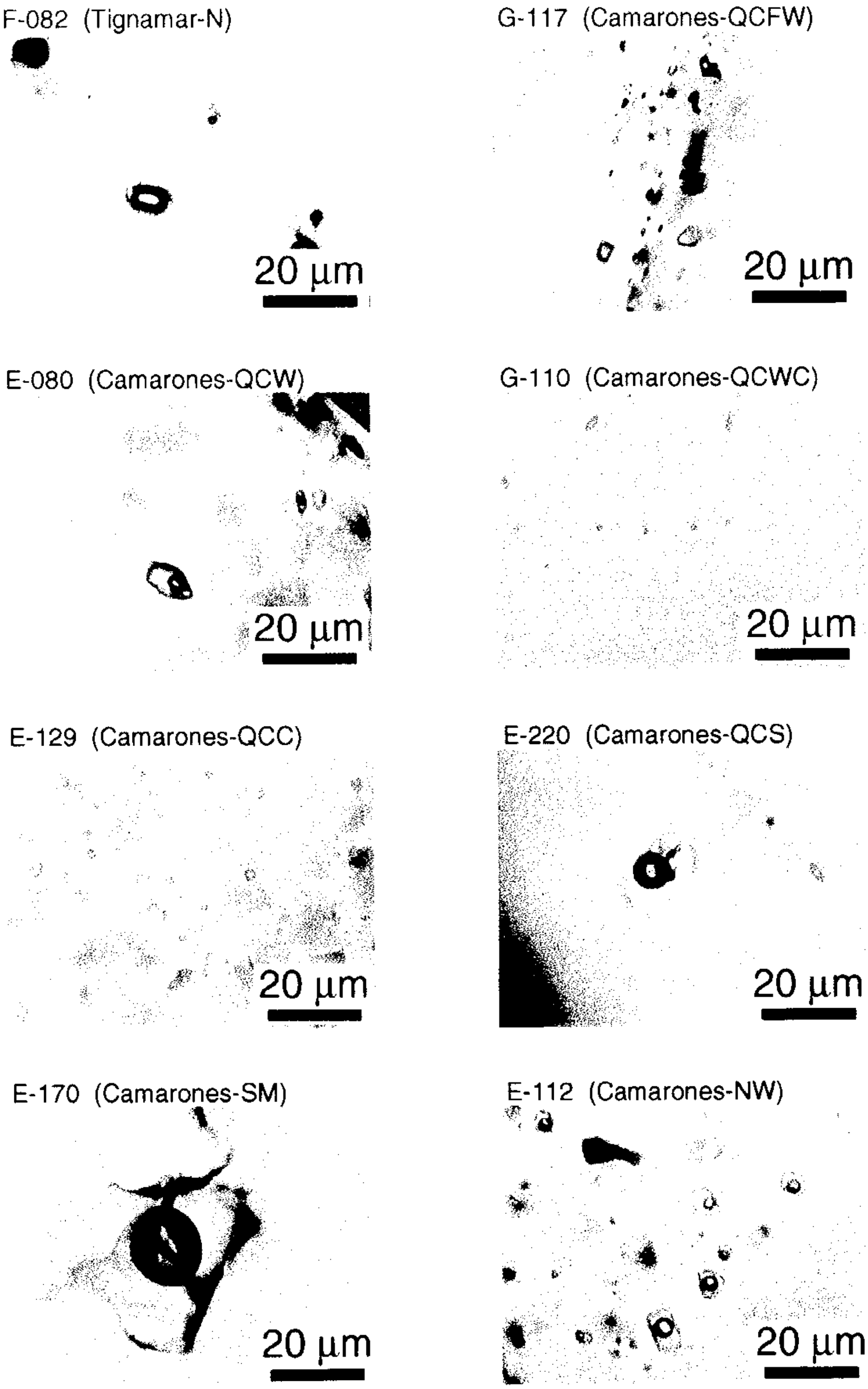


Photo 6 Photomicrographs Showing Fluid Inclusion Textures (Phase 2)
refer AP-5 (2)