2-8 Discussion

2-8-1 Geology, Geologic Structure and Mineralization

General geological features in the Da Mai, Ngan Me and Gang areas are discussed altogether in this section.

Through the semi-detailed geological survey in the first phase, three promising areas for mesothermal-type gold deposits have been extracted within the Bo Cu area, although the priority exists due to the limitation in the amount of exploration work. Those were: Da Mai, Ngan Me and Gang areas. Moreover, several anomalous zones have been closed-up as interesting extensions of these promising areas by the regional geochemical exploration. They were: North of N. Bo Cu and Khe Ma both located to the east of the Da Mai area, Khe Can located to the north of the Ngan Me area, Khe Cam located to the northeast of the Ngan Me area, and Bai Vang located to the east of the Ngan Me area.

It was said that the gold-bearing quartz veins in the survey area belonged to the mesothermal type gold deposit. This matter was thought to be confirmed according to the following evidences obtained during the survey in the first phase:

- •Geologic environment that the veins are hosted mainly by sedimentary and metamorphic rocks of the Cambrian system.
- •Gangue minerals of vein (consisting almost only of quartz).
- •Ore mineral assemblage (particularly, arsenopyrite, pyrite, chalcopyrite and galena are accompanied).
- •The occurrence of pyrrhotite and bornite which probably means comparatively high temperature type deposit is admitted.
- •Alteration features (mainly composed of silicification, sericitization and chloritization) .
- •Significantly low Ag/Au ratio (≈1.5 averaging of 88 ore samples in the detailed survey area)
- •Results of fluid inclusion studies indicating the mesothermal conditions of vein formation.

The geology of the Bo Cu area consists of sedimentary and metamorphic rocks of Cambrian, Ordovician, and Devonian to Jurassic systems. Acidic volcanics occur in the lower-middle Triassic system. The major part of these geologic units exhibits the NE-SW to ENE-WSW direction which represents the characteristics of the regional geologic structure, and forms a complex folding structure. The Bo Cu area is cut into many blocks by tectonic faults. Intrusive of a large-scale igneous complex was not found in this area; only small stocks of granite occur within and in the vicinity of the Bo Cu area. The Bo Cu area is structurally characterized by a series of anticlines and synclines named Bac Son anticlinorium comprising Bo Cu anticline, Bac Son anticline and Trang Xa-Nhat The syncline. The

major directions of these folding axes are NE-SW to ENE-WSW in the northwestern to the eastern part. Whereas in the southwestern part of the area, there is a distinctive anticlinal structure whose axis trends WNW-ESE. Most of gold-bearing quartz veins occur at the crest and on the wing of this anticline. The main orogenic activity in the Bo Cu area was interpreted to be occurred in the Triassic or later period. The formation of the Bo Cu anticline, the formation of regional tectonic faults and acid volcanic activity in the Song Hiem Formation unanimously indicate the importance of this period.

Gold-bearing quartz veins in the Bo Cu area belong to the mesothermal-type gold deposit. The occurrence of gold veins is characterized structurally by the spatial closeness to the Bo Cu anticline. Three promising areas for the mesothermal gold deposit were extracted through the survey in the first phase within the Bo Cu area, and the detailed survey was carried out in two of the areas in the second phase.

Concerning the geological settings and vein structure, each area shows its characteristic feature.

The Da Mai area is located on the northern wing of the Bo Cu anticline. The veins were divided into two groups in their trends: (1) E-W system with dips of steep S, and (2) E-W system with dips of gentle N. Although the basic trends are like these, there is small change in the prospects. In the Da Mai-Khe Dui prospect, the most remarkable trend is E-W with 53°S, and next is E-W with 40°N. It changes slightly to the east in the NE of N. Bo Cu prospect, where there are E-W trend with 73°S and E-W trend with 20°N. In the Khe Ma-S. Khuon Da prospect which is situated in the most eastern part of the Da Mai area, veins of the E-W trend with dips of steep S become obscure; veins of N-dip are distinct (ENE-WSW with 52°N). Veins appear to be formed in fissures of tensional nature. Most of the veins are discontinuous, not so long.

The Ngan Me area is situated from the central to the southern wing of the Bo Cu anticline. The vein systems show mainly E-W trend with dips of gentle to steep S. They also change slightly from prospect to prospect. In the Ba Khe and Middle Ba Khe-Left Ba Khe prospects, veins of E-W trend with moderately (45°) S-dips are common. In the Bai Vang prospect which lies to the east of the Ba Khe prospect, veins of E-W trend with steep S-dips become common. In the Khe Can and Khe Cam prospects, both is situated near the crest of the Bo Cu anticline, E-W to ENE-WSW trends with dips of gentle S are dominant. The Ba Khe group of veins sometimes exhibits a lens-like shape. They are branching and thickening /thinning quite frequently. Massive quartz veins up to 6 m in width occur in the Middle Ba Khe-Left Ba Khe and Khe Can prospects.

The mineralization in these two areas has its characteristic feature.

In the Da Mai area, some veins are relatively rich in sulfide minerals. Veins which contain a significant amount of sulfide minerals are those in Khe Dui and in Khe Khuon Phung in the Da Mai-Khe Dui prospect. Sulfide minerals identified in the Da Mai-Khe Dui area are: pyrite, arsenopyrite, pyrrhotite, chalcopyrite, covelline, chalcocite, tetrahedrite, sphalerite, galena, scorodite, and limonite. Native gold of up to 0.3 mm in diameter was found in some samples from Khe Dui. Native gold

frequently occurs as free gold in quartz veins. It also occurs in a form accompanied by sulfide minerals such as arsenopyrite and scorodite. Ag/Au ratio in samples is generally low in this area. The average Ag/Au ratio calculated from analytical results of both ore and rock-chip samples is about 1. Alteration around quartz veins is not so strong in the Da Mai area. Host rocks of several centimeters to a few meters from veins were altered. Alteration observed in this area is: silicification, chloritization, sericitization, and carbonitization. Results of fluid inclusion studies revealed that the formation temperature of quartz varied in a broad range: from low to medium temperature up to significantly high temperature (over 380 °C). The salinity of fluid inclusions indicated that the ore fluid was relatively thick in NaCl content (up to 8 wt. %). Polyphase inclusions were identified comparatively often in quartz. Halite was observed as solid crystals in such inclusions.

In the Ngan Me area, most of the veins are relatively poor in sulfide minerals. Veins which contain a significant amount of sulfide minerals are those in Ba Khe and in Na Hon in the Ba Khe prospect. Sulfide minerals observed in the Da Mai-Khe Dui area are: pyrite, arsenopyrite, pyrrhotite, chalcopyrite, covelline, sphalerite, galena, and limonite. Ag is slightly high in samples this area. The average Ag/Au ratio calculated from analytical results of both ore and rock-chip samples is around 4. Alteration around quartz veins is not so strong in the Ngan Me area. Host rocks of several centimeters to a few meters from veins were altered. Alteration observed in this area is: silicification, chloritization, sericitization, and carbonitization. Results of fluid inclusion studies were not so different from those in the Da Mai area. They showed that the formation temperature of quartz varied in a broad range; similar but slightly narrower variation than those in the Da Mai area. The salinity of fluid inclusions showed moderately thick in NaCl content (about 5 wt. %). Polyphase inclusions were identified in quartz.

In short, two areas show their own features in the vein trend, mineral assemblage and fluid inclusion property. Da Mai area: occurring two groups of vein trends in the same area -- E-W trends with dips of steep S and with dips of gentle N, relatively rich in sulfide minerals, low Ag/Au ratio, fluid inclusions of broad range of homogenization temperature, relatively high salinity and fine size; Ngan Me area: veins of E-W trend with dips of gentle to steep S, relatively rich in Ag content, broad variation of homogenization temperature and moderately high salinity in fluid inclusion property. These varieties are understood to be originated from the difference of structure and conditions of their formation. The spatial relation with the heat source -- probably somehow related to the granitic intrusion -- is considered to be the main factor concerned.

The place of the mineralization in this area was presumed within a marginal part of the South China plate according to the results of the regional geological survey in the first phase. It suggests that the gold mineralization in this area probably belongs to the category of the continental-type gold deposit.

2-8-2 Geochemistry

General geochemical features in the Da Mai, Ngan Me and Gang areas are discussed altogether in this section.

In the first phase, stream sediment geochemical survey and panning survey were carried out during the regional survey. Through these surveys, several significant anomalies were outlined in the Bo Cu area. The major anomalous zones thus defined were: upper reaches of S. Ca, northeast of N. Bo Cu, middle reaches of S. Hoan, upper reaches of S. Ngan Me, and upper reaches of S. Bai Vang. The origins of these anomalies were identified later. The first and second zones corresponded to the gold-bearing quartz veins in the Da Mai and surrounding area, the third to the Gang area, the fourth to the Ngan Me area, and the fifth to the Bai Vang area. The panning anomalies were matched almost exactly with the stream sediment anomalies.

In the second phase, rock-chip geochemical survey was carried out in the Da Mai and Ngan Me areas for the purpose of defining hidden mineralized zones which would otherwise be undetected by geological survey, as well as for clarifying the extensions of mineral occurrences encountered through the geological traverse. Quartz vein and altered rock samples were collected from every outcrop and some pits/trenches in the survey area. The results of ore assays were examined together with the geochemical results. Several significant anomalous zones were outlined through the rock-chip geochemical survey. The major anomalous zones thus defined are: Da Mai-Khe Dui, Northeast of N. Bo Cu and Khe Ma-Khuon Da prospects in the Da Mai area, Ba Khe, Middle Ba Khe-Left Ba Khe, Bai Vang and Khe Can prospects in the Ngan Me area. Among these localities, intensive Au anomalies were found at (1) Da Mai-Khe Dui-West Da Mai zone in the Da Mai area, and (2) Ba Khe-West Ba Khe-Na Hon zone in the Ngan Me area. These two zones are also characterized by the co-occurrence of anomalies of various basemetal elements, especially Pb and As.

The correspondence of basemetal elements to Au is very well both in the Da Mai and Ngan Me areas. Generally, they occur in a concentrated form at some small areas. As shown above, the best association with Au was observed in As. Next was in Pb. The other elements also showed some significant correspondence to Au. It was not clear in Hg because the detection limit of the analysis was not enough to the discussion.

Each zone has a specific feature in the intensity and assemblage of anomalous elements. In the Da Mai-Khe Dui-West Da Mai zone, Au anomalies occur very intensively. It is remarkably high in the level of Au. Within this zone, West Da Mai is characterized by the occurrence of Cu anomalies. Whereas, Khe Dui is characterized by the occurrence of Pb anomalies. Da Mai is rather monotonous; only weak As anomalies were detected together with Au anomalies. In the Ba Khe-Na Hon-West Ba Khe zone, As anomalies, very intense ones, occur almost all over the zone. Weak Hg anomalies and strong Fe association were found in this zone. These characteristic features can be explained by the mineral assemblage of gold-bearing quartz veins.

2-8-3 Geophysics

General geophysical features in the Da Mai, Ngan Me and Gang areas are discussed altogether in this section.

In the first phase, CSAMT survey was carried out in the Da Mai, Ngan Me and Gang areas, and the following results were obtained.

The laboratory test results confirmed that the quartz vein has remarkably high resistivity. It can be seen that when the group of quartz veins (many quartz veins concentrated) is large in width (more than 100 m) , a high resistivity zone is extracted. The relationships between the high resistivity zones (related to quartz veins) extracted by CSAMT and the known prospects are as follows.

Da Mai area: The high resistivity zones expected to result from the group of quartz veins were detected at the following locations.

- No.7 and 8 on lines D-3 to D-5
- Southern part of lines D-7 to D-9

The high resistivity zone at the No.7 and 8 on lines D-3 to D-5 results from the Da Mai prospect and that in the southern part of lines D-7 to D-9 results from the Goc San prospect. They are expected to be relatively steep and extend to the deep zone. A high resistivity zone related to the Khe Dui prospect was not extracted. It is supposed that the prospect was shielded by low resistivity zones in the surface.

Gang Area: The high resistivity zones expected to result from the group of quartz veins were detected at the following locations in the shallow zone.

- Southern part of lines G-5 to G-7
- Middle part of lines G-3 to G-4
- Northern part of lines G-4 to G-7

The high resistivity zones in the southern part of lines G-5 to G-7 and the middle part of lines G-3 to G-4 result from the Khe Gang prospect. In the vicinity of the northern part of line G-4 to G-7, the known prospect is not found. These high resistivity zones are restricted up to the depth of about 100 m from the surface and do not extend to the deeper zone. They will have gentle dip, since they are distributed rather broadly in the shallow zone.

Ngan Me area: The high resistivity zones expected to result from the group of quartz veins were detected at the following locations.

- Southern part of line N-5
- Middle part of line N-2

These high resistivity zones result from the Ba Khe prospect. Especially, the zone in the southern part of line N-5 extends to the deeper zone with steep dip and is expected to extend to the east. The extension of the high resistivity zone to the west (the West Ba Khe prospect) was not detected, since it was probably intercepted by the low resistivity zone attributed to fracture zone. High resistivity zones related to the Left Ba Khe - Middle Ba Khe prospects were not extracted. Because it is supposed that these prospects are small in size and the resistivity of this area is somewhat low on an average.

In the second phase, IP survey was carried out in the Da Mai and Ngan Me areas, and the following results were obtained.

In these areas, the geophysical survey results gave the followings to the IP anomalies extracted in a zone where quartz veins are distributed.

- Strong chargeability anomaly
- Weak chargeability anomaly
- High resistivity anomaly

Strong chargeability anomaly is highly related to a distribution of quartz veins and connected with a distribution of quartz veins containing a considerable amount of sulfide minerals. Weak chargeability anomaly is expected that quarts veins containing a small amount of sulfide minerals are distributed, in case where the chargeability of the host rocks is low. High resistivity anomaly may be expected that a large group of quartz veins is distributed. The locations and features of the above anomaly zones extracted in the Da Mai and Ngan Me area, and the relation to the known prospects are as follows.

1) Da Mai area

<u>Strong Chargeability Anomaly</u>

- Northern part of lines D-IP-8 to D-IP-10

This anomaly zone has a WNW-ESE direction and is composed of two parallel anomalies. It tends to further continue to the east of the survey area and extend to the deeper zone. It seems to reflects the prospect around Khe Dui stream. It suggests that the prospect around the Khe Dui stream contains a large amount of sulfide minerals and continue to the east.

Weak Chargeability Anomaly

•Central part of the survey area

This anomaly zone has a WNW-ESE. However, it tends not to extend to the deeper zone. It seems to be attributed to the prospect around the Da Mai stream. In this year, the drilling exploration was carried out in the western part of this anomaly zone and caught the groups of quartz veins containing a small amount of sulfide minerals. This result is matched with the geophysical survey results.

2) Ngan Me area

Strong Chargeability Anomaly

•Southern part of lines N-IP-2 to N-IP-9

This anomaly zone is the broadest in the Ngan Me area. It includes high chargeability more than 40 mV/V in lines N-IP-1 to N-IP-2 and lines N-IP-8 to N-IP-9. It has a E-W direction, and tends to incline to the south and disappear in the deep zone below SL 50m. It seems to be attributed to groups of quartz veins containing a large amount of sulfide minerals in the Ba Khe prospect around the Na Hon stream. It shifts slightly toward the south of the known quartz veins

•Central part of lines N-IP-1 to N-IP-2.

This anomaly zone is the second broadest in this area and includes high chargeability more than 40 mV/V. It tends not to extend in the deep zone below SL 0m. It seems to be attributed to groups of quartz veins containing a large amount of sulfide minerals in the Ba Khe prospect around the Ba Khe stream. The known quartz veins are distributed around this anomaly zone.

•Northeastern part of the survey area

Small scale anomaly zones are scattered. It seems to be attributed to groups of quartz veins containing a large amount of sulfide minerals in the Middle Ba Khe - Left Ba Khe prospect.

High Resistivity Anomaly

Broad high resistivity anomaly zones are distributed in the ridge parts located a little to the south of the survey area. They are distributed up to 50 m from the surface in depth. Their distributions could not conform to those of the known quartz veins.

2-8-4 Potential of Mineral Resources

Gold potential has been expected in the Bo Cu area, and some ideas were proposed in the first phase survey. The type of mineralization is mesothermal gold-bearing quartz veins hosted by the Cambrian Mo Dong and Than Sa Formations; the veins occur on the wing of the Bo Cu anticline; the formation of veins is controlled structurally by the regional folding activity; the development of quartz veins is relatively intense; geochemical anomalies occur densely; remarkable chargeability anomalies occur; the size and magnitude of gold mineralization are estimated to be medium or small from the features of mineral showings and geochemical/geophysical anomalies.

In the second phase, the detailed survey comprising geological survey, rock-chip geochemical survey, IP geophysical survey and reconnaissance drilling were carried out in two areas selected by the first phase survey. Two holes totaling 600.00 m were drilled in the Da Mai-Khe Dui prospect. Many significant intersections of gold-bearing quartz veins were caught in these reconnaissance drill holes, although some of the targeted extensions of veins on the surface have been appeared to be insignificant in the depth.

In MJVB-1, thirteen major groups of quartz veins were caught in total. Although native gold was observed in drill cores and slime of drilling at several depths in the field, no significant assay result was obtained. The extension of the significant gold-bearing quartz vein, which was discovered by the Division during an early phase of surface survey in 1990 and which occurs about 200 m northwest of the drill hole, has not been caught in the drill hole. It was thought to be disappeared in the depth.

In MJVB-2, thirteen major groups of quartz veins were intersected, and several significant intersections were returned as follows: 56.640 g/t Au and 9.0 g/t Ag (28 cm in width, 51.24 – 51.52 m), 1.880 g/t Au and 2.0 g/t Ag (49 cm in width, 137.38 – 137.87 m), 1.020 g/t Au (11 cm in width, 181.00 – 181.11 m), 10.815 g/t Au (10 cm in width, 181.22 – 181.32 m), and 1.400 g/t Au (12 cm in width, 256.67 – 256.79 m). These significant assays were obtained from some of the veins which occurred in swarms of quartz veins, veinlets or networks. The width of each vein changes considerably from a few centimeters to a few meters.

In the third phase, two holes totaling 600.00 m were drilled in the Da Mai-Khe Dui prospect in the Da Mai area, and other two holes totaling 600.00 m were drilled in the Ba Khe prospect in the Ngan Me area. Some significant intersections of gold-bearing quartz veins were caught in these drill holes in the Da Mai-Khe Dui prospect (MJVB-3 and MJVB-4) as well as in the second phase. The result of drilling in the Ba Khe prospect (MJVB-5 and MJVB-6), however, was disappointing.

In MJVB-3, a total of eight major groups of quartz veins were caught. Several significant intersections were returned as follows: 75.600 g/t Au and 3.0 g/t Ag (35 cm in width, 79.85 – 80.20 m), 1.770 g/t Au (33 cm in width, 147.60 – 147.93 m), and 0.570 g/t Au (37 cm in width, 230.77 – 231.14 m). The extensions of some gold-bearing quartz veins which occurred on the surface in the Khe Dui creek were caught in the drill hole. Most of them showed no gold value.

In MJVB-4, eight major groups of quartz veins were intersected. The development of quartz veins/networks were remarkable in this hole, especially at the depth from around 100 to 150 m. Only one significant result was returned in this hole: 12.400 g/t Au (45 cm in width, 60.15 – 60.60 m).

Gold occurs mainly as free native gold in quartz vein in the Bo Cu area. This is the main reason why the gold grade exhibits an very erratic nature in drill cores; very high grades of Au were returned from some part, while other part showed no significant value of Au even where visible gold was observed on the core and gold grains were recovered from slime of drilling. Generally gold grade becomes higher in a part where is relatively rich in sulfide minerals. Two most common sulfide minerals thought to be related to the gold mineralization are: pyrite and arsenopyrite. In details, however, gold grades are not connected directly with sulfide contents.

The drilling this year was carried out aiming at the high chargeability anomaly zones based on the IP geophysical exploration done in the second phase. The laboratory tests and examination using drill core samples were made about the relationship between sample properties and the distribution of chargeability, and the following results were obtained:

(1) The drilling this year penetrated through the central part of the high chargeability zone (>30mV/V) in every hole. The chargeability of quartz vein samples was measured by using the drill cores, and very high chargeability values were indicated (up to 356mV/V).

(2) These quartz veins contain a lot of sulfide minerals (pyrite and arsenopyrite).

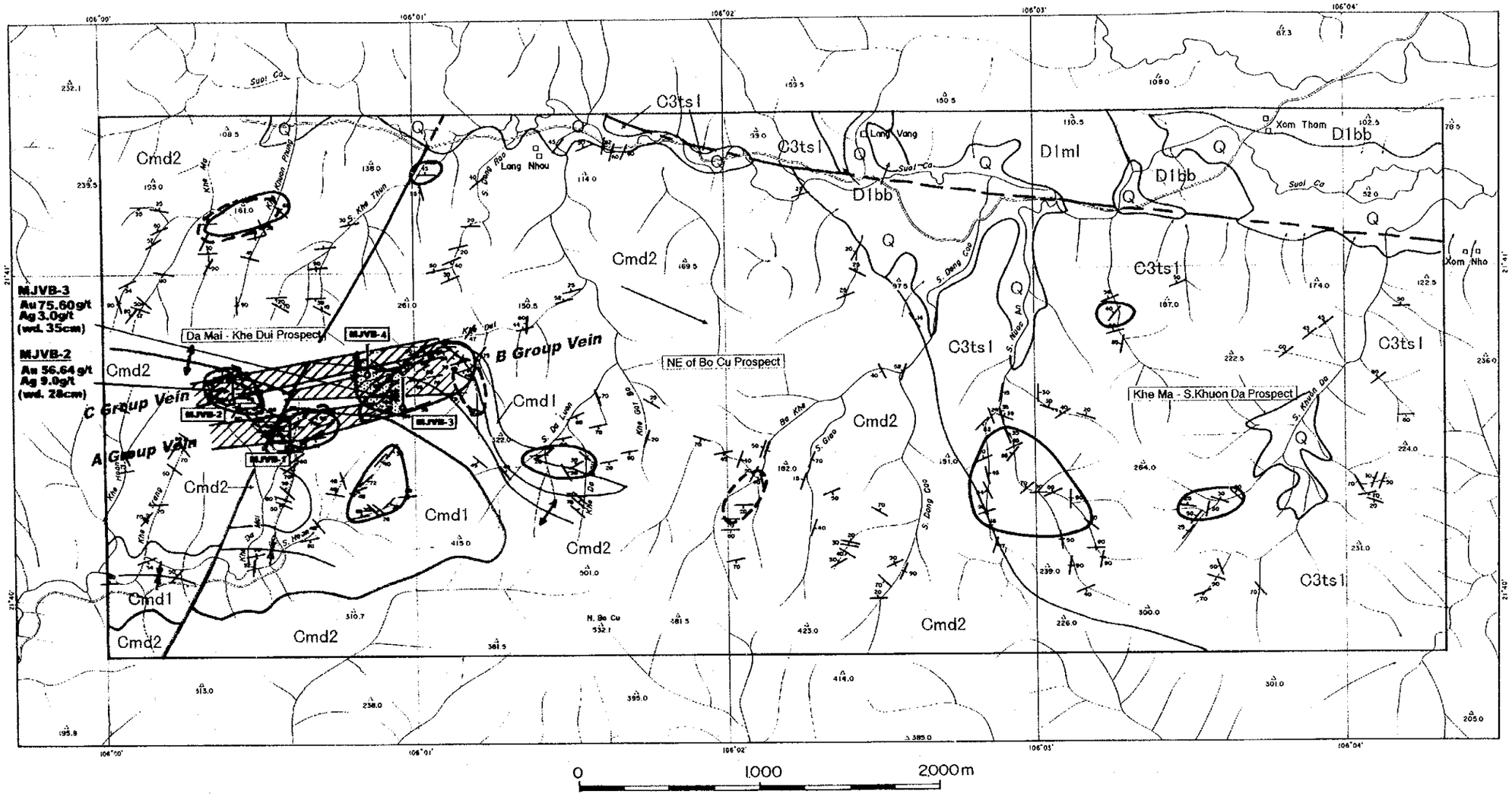
(3) Chargeability were low (at around several mV/V) in sandstone, schist and quartz vein of relatively poor in sulfide content.

(4) As the distribution of chargeability and the distribution of quartz veins are concerned in detail, there were several discrepancies. Because most of the quartz veins are thin; they show irregularly in the distribution. It is natural that they don't meet perfectly.

Thus, it was thought to be confirmed by these tests that the overall distribution of IP anomalies has been explained by the distribution of quartz veins in drill holes. It was also confirmed that the high chargeability anomalies were originated, not all but at least partially, from the distribution of quartz veins which contain a certain amount of sulfide minerals.

As an evaluation of potentials for gold deposit in this area, the following conclusions were deducted as a result of survey for three years. Gold-bearing quartz veins in this area were lack of continuation and small scale. They dispersedly occur, without any concentration of significant scale. Some of them occasionally show very high grade in Au. Such grades, however, are not stable. The dimension of gold resources was considered to be something from several hundreds to several thousand tons of ores; that is unfortunately far smaller than what is required in our exploration.

The integrated interpretation of the survey results in the Da Mai area is shown in Fig. 2-2-12.



LEGEND

Quaternary	Q Alluvial Deposits	
Devonian	D1ml Mia Le Formation	
	D1bb Bac Bun Formation	
Cambrian	C3ts1 Lower Than Sa Formation	
	Cmd2 Mo Dong Formation 2. Mainly composed of sandstone 1. Alternation of schist & sandstone	
		Fault
		Anticlinal Axis
		Synclinal Axis
		Drill Hole (Phase II & III)
		Gold-bearing Quartz Vein
		Group of Vein
		Major Geochemical Anomaly (Au)
		Major Geochemical Anomaly (Basemetal)
		Strong IP Anomaly (Chargeability > 30mV/V)
		Weak IP Anomaly (Chargeability > 15mV/V)

Fig. 2-2-12 Integrated Interpretation of the Survey Results in the Da Mai Area

Chapter 3 Ngan Me Area

3-1 Introduction

Gold-bearing quartz veins occur extensively in the Ngan Me area. Semi-detailed and detailed surveys comprising geological survey, rock-chip geochemical survey, geophysical survey (CSAMT and IP methods), and drilling exploration have been carried out in the Da Mai area for three phases (Phase I, II and III). Although the development of quartz veins is extensive, the results of reconnaissance drilling carried out in the third phase were disappointing.

3-2 Geological Survey

3-2-1 Outline of Survey

The semi-detailed survey consisting of geological survey, geochemical survey (stream sediment and panning surveys, as parts of the regional geochemical works mentioned in the previous chapter) and geophysical survey (CSAMT method) was carried out in the Nga Me area in the first phase as a part of the survey in three areas (Da Mai, Ngan Me and Gang areas). The purpose was to survey mineral showings in the area, to catch geochemical anomalies and to define target mineralization for the next phase exploration. Geophysical survey using the CSAMT method was carried out in the semi-detailed survey area for the purpose of investigating the relationship between resistivity and geologic structure. The survey area was amounted to 16 km^2 in total three areas. The regional geologic map of 1:50,000 scale was generated as a result of this survey.

Based on the results of the first phase survey, which were composed of regional geological survey, stream sediment geochemical survey, panning survey, semi-detailed geological survey and geophysical survey (CSAMT method), two areas – Da Mai and Ngan Me areas – were selected for the potential gold prospects in the second phase detailed survey. These two areas were amounted to approximately 40 km^2 in total. Along with the detailed geological survey, detailed rock-chip geochemical survey was carried out in the second phase. The major themes followed in the detailed geological survey together with the detailed rock-chip geochemical survey were: (1) to survey mineral showings in the prospects, to catch geochemical anomalies, and to define target mineralization for the further exploration by means of the detailed investigation on geology and mineralization, and (2) to prepare geologic maps of 1:10,000 scale.

3-2-2 Semi-Detailed Geological Survey (Phase I)

(1) Survey Method

Gold-bearing quartz veins in the Ngan Me area were preliminary surveyed in the first phase following to the regional geological survey. The occurrence of veins was investigated with some representative sketches of 1:50 to 1:100 scale and samples for assaying and laboratory works. The number of samples collected in the survey was already mentioned in the section of the Da Mai area. The results of these studies are shown in the summary tables. The summary of the Schumidt's stereo net projections of quartz veins is explained in the section of the detailed geological survey. The results of the fluid inclusion studies are explained in a section below.

(2) Geology and Mineralization

The Ngan Me area is located to the south of the Da Mai area. Local miners came to this area in 1989, and mining activities started. The Division made a survey (including trenching) from 1990 for about two years. Major gold-bearing quartz veins occur near Ba Khe (which means a junction of tree creeks) which lies at the upper reaches of S. Ngan Me. The other localities where many quartz veins occur are: an area between the Left Ba Khe creek and the Middle Ba Khe creek , and the West Ba Khe creek. These groups of quartz veins contain some gold although any systematic sampling had not been done yet.

Gold-bearing quartz veins in the Ngan Me area are hosted mainly by sandstone, shale and phyllite of the Mo Dong Formation. The geology of the southwestern corner of the Ngan Me area consists of sandstone, phyllite and schist of the Than Sa Formation (lower member). Host rocks of the West Ba Khe zone belong to the Than Sa Formation. The width of veins changes place to place from a few centimeters up to 2 m. Veins often show a lens-like shape. The main trend of vein systems is E-W to ENE. Two groups of veins - one is steeply dipping to S, and another is gently dipping to S - were distinguished on the basis of the stereo net analysis. The content of sulfide minerals in quartz veins is rather little comparing to the other areas. A small amount of pyrite was seen in some veins. A trace of arsenopyrite, pyrrhotite, chalcopyrite, covelline, sphalerite, galena was observed in some part of the veins. Host rocks beside the veins are sheared and slightly altered. The major alteration observed in the country rocks are: silicification, sericitization, and chloritization. Based on the results of geochemical survey in the first phase, significant gold anomalies were found along the upper reaches of Bai Vang which is located about 2 km due east of the Ba Khe prospect.

The mode of occurrence of quartz veins in the major prospects are described as follows.

Ba Khe: Many local people are currently working in the Ba Khe prospect. More than fifty adits, cross-cuts and inclined shafts are distributed in the direction of E-W along the upper reaches of S. Ngan Me for about 900 m. Quartz veins are hosted by black phyllite and sandstone of the Mo Dong Formation. The width of quartz veins changes variously; some part show a lens-like shape. Branching and joining of quartz veins were frequently observed. At the eastern end of the creek there are several quartz veins cropped out on the river bed. Native gold grains were found from one of the samples collected at that locality. A small amount of pyrite with a trace of other sulfide minerals such as chalcopyrite, sphalerite and galena was recognized near the gold grain under the microscope.

Left Ba Khe-Middle Ba Khe: Numerous quartz veins occur at the upper reaches of the Middle Ba Khe creek and also upper reaches of the Left Ba Khe creek. Quartz veins generally show massive features. The width reaches up to 2 m. Some of them contain a significant amount of sulfides - mainly pyrite. The Left Ba Khe zone is situated about 700 m west of the Middle Ba Khe zone. These two localities are arranged in a one zone running nearly E-W. Gold assays from these quartz veins were low this time.

3-2-3 Detailed Geological Survey (Phase II)

(1) Survey Method

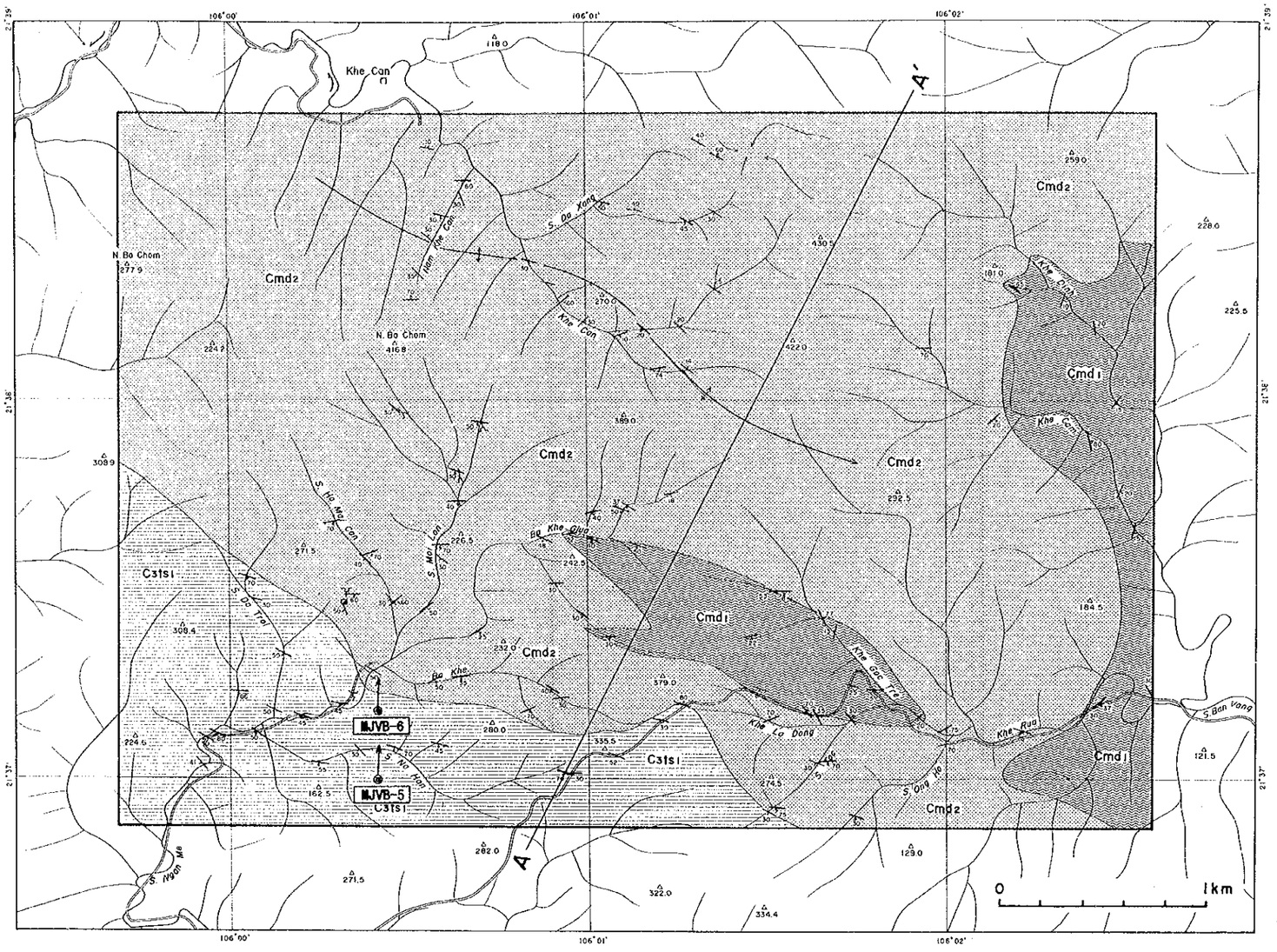
The same method as in the Da Mai area was taken in the detailed geological survey in the Ngan Me area

A total length of 86 km was explored during the survey in the survey areas (Da Mai and Ngan Me), and the geological information was compiled into a geologic map of 1:10,000 scale. The geology and geologic profile of the survey areas are shown in Fig. 2-3-1.

The number of samples collected in the survey was already mentioned in the section of the Da Mai area. The assay results of ore samples in the Ngan Me area is shown in Table 2-3-1.

(2) Geology

The general geology and stratigraphy were already explained in the section of the Da Mai area.



LEGEND

STRATIGRAPHY

Cambrian

- C3ts1 — Lower Than Sa Formation
- Cmd — Mo Dong Formation
  - 1 : alternation of schist and sandstone
  - 2 : mainly composed of sandstone

OTHERS

- Fault
- 30 — Dip and strike of bedding / schistosity
- 80 — Dip and strike of quartz vein
- Anticlinal axis
- Adit / Inclined shaft
- Shaft / Pit
- A — A' — Geologic section line
- Drill hole

A — A'

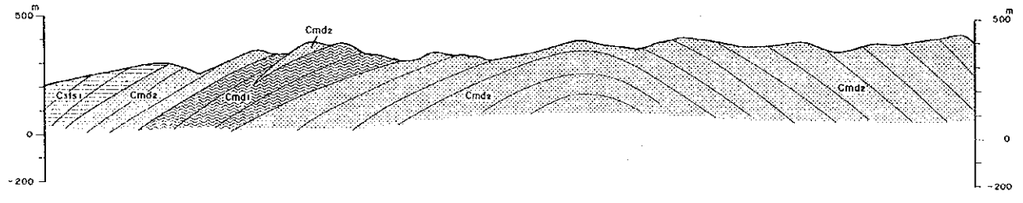


Fig. 2-3-1 Geology and Geologic Profile of the Ngan Me Area

Table 2-3-1 Assay Results of Ore Samples in the Ngan Me Area (Second Phase)

Ser. No.	Sample No.	Width (cm)	Au (g/t)	Ag (g/t)	Cu (%)	Pb (%)	Zn (%)	Fe (%)	Location	Remarks
Ngan Me Area										
1	A123A	10	0.190	1.0	0.003	0.003	0.003	2.31	Ho Mai	White Qz vein.
2	A138A	15	0.006	<0.5	0.002	0.005	0.001	1.06	Ho Mai	L-gray Qz vein.
3	A148A	100	0.037	0.6	0.005	0.004	0.008	10.39	Na Hon	White/L-gray Qz vein.
4	A151A	4	0.010	<0.5	0.002	0.006	0.003	1.97	Na Hon	L-gray Qz vein.
5	A156A	2	0.012	0.5	0.003	0.004	0.003	3.27	S. Ngan Me	White/L-gray Qz vein.
6	A165A	8	0.015	1.6	0.004	0.006	0.001	2.74	Khe Chuoi	L-gray Qz vein.
7	A166A	20	0.033	<0.5	0.002	0.030	0.003	4.23	Khe Chuoi	L-gray Qz vein
8	A167A	60	0.040	0.7	0.003	0.002	0.001	2.79	Khe Chuoi	White Qz Vein.
9	A208A	30	0.005	<0.5	0.015	0.008	0.006	3.32	Khe Can	Qz vein.
10	B096A	40	0.030	<0.5	0.002	0.012	0.005	3.80	Ba Khe	White/L-gray Qz vein, Py diss.
11	B098A	25	0.733	0.6	0.002	0.009	0.002	2.55	Ba Khe	White/L-gray Qz vein, Py diss.
12	B104A	30	0.020	<0.5	0.001	0.005	0.001	1.20	Ba Khe	White/L-gray Qz vein, Py diss.
13	B110A	50	0.263	<0.5	0.004	0.005	0.002	2.79	Ba Khe	L-gray Qz vein, Py diss.
14	B117A	20	0.010	<0.5	0.002	0.005	0.003	3.22	Ba Khe	White Qz vein, Py diss.
15	B123A	10	0.340	<0.5	0.002	0.003	0.002	2.16	Ba Khe	White/L-gray Qz vein, Py diss.
16	B126A	10	0.095	<0.5	0.003	0.012	0.002	2.36	Ba Khe	White Qz vein, Limo diss.
17	B127A	20	0.475	0.5	0.005	0.047	0.002	2.84	Ba Khe	White/L-gray Qz vein, Py diss.
18	B130A	15	0.017	<0.5	0.002	0.003	0.002	1.83	Ba Khe	L-gray Qz vein, Py diss.
19	B133A	250	0.677	1.6	0.029	0.014	0.003	7.41	Dong	White/L-gray Qz vein, Py diss.
20	B137A	20	0.025	<0.5	0.007	0.005	0.001	2.31	Dong	White Qz vein, Py diss.
21	B150A	30	0.133	1.0	0.009	0.033	0.003	3.37	Goc Tro	White/L-gray Qz vein, Py diss.

(3) Geologic Structure

The Bo Cu area is structurally characterized by a series of anticlines and synclines called Bac Son anticlinorium. It is elongated from Bo Cu mountain following east to northeast to Bac Son, Dong Mo until Lang Son. It is well proportioned; the southern side is cut by a fault running along the national road No. 1a and Quynh Dong-Bo Ha fault. The northern side is componented by Mesozoic formations. The axis of the anticlinorium orientates to ENE-WSW to NE-SW. It passes through Bo Cu, Mo Nhai and Bac Son. It is composed of terrigenous, terrigene-carbonate, carbonate, and terrigene-volcanic sediments of the middle Cambrian to the middle Triassic in ages. The Bac Son anticlinorium consists mainly of Bo Cu anticline, Bac Son anticline and Trang Xa-Nhat The syncline. The time of these folding activities is considered to be Mesozoic.

Three major faults systems are distinguished in the Bo Cu area: NW system, N-S system and NE system. Faults of NW system are normal, compound ones, generated earlier than those of NE system. The most prominent NW fault occurs in the southern part of the Bo Cu area, running from Thai Nguyen through Trai Cau and Quynh Dong down to Yen Thien. Both NW and SE sides are cut through Mesozoic strata, and partly covered by Quaternary sediments. This fault system is interpreted to be formed nearly at the same time as the Bo Cu anticlinal activity. Faults of N-S system occur in two areas: May Khoan-Khao Lien-Deo Giao, and Coc Vuong-Dong Khuong. These sublongitudinal faults are cut in many places by faults of NE system. Faults of NE system occur pervasively over the Bo Cu area. They are subdivided into two groups: northwestern group and southeastern group. These faults cut both those of NW system and N-S system. Along these faults, intense deformation and shearing are observed.

The Ngan Me area is situated from the central to the southern part of the Bo Cu anticline. The geology shows WNW-ESE to E-W trend in general. The strata dip to the south at the central to the southern part of the area. Whereas in the northern part, they show flat or gentle N-dip.

The geology of the Ngan Me area is composed of Mo Dong and Than Sa Formations. Most of the area is covered by sandstone of the Mo Dong Formation. The Than Sa Formation – Lower Member – occurs at the southwestern part of the area, where it strikes E-W to WNW-ESE and dips steeply to the south. Gold-bearing quartz veins are hosted both by the Mo Dong and Than Sa Formations. No specific fault was observed in the Ngan Me area.

(4) Mineralization

Gold-bearing quartz veins are developed in Da Mai, Gang, Cay Thi, Ngan Me and Bai Vang. These were regarded to be a mesothermal gold deposit. The occurrence of gold-bearing quartz veins

in the Da Mai and Ngan Me (including Bai Vang) areas was surveyed in detail in the second phase. The general nature of gold mineralization was already explained in the section of the Da Mai area.

The Ngan Me area is located some 3 km south of the Da Mai area. Local miners came to this area in 1989; since then mining activities started. The Division No. 1 made a survey (including trenching) from 1990 for about two years. Major gold-bearing quartz veins occur near Ba Khe which lies at the upper reaches of S. Ngan Me. Ore reserves estimated by the Division at that time were 1,500 kg Au for hard rock gold (shallow part) and 130 kg Au for alluvial gold (along S. Vai Bang).

Gold-bearing quartz veins in the Ngan Me area are hosted mainly by sandstone, black shale and schist of the Mo Dong Formation. The geology of the southwestern corner of the Ngan Me area consists of sandstone, phyllite and schist of the Than Sa Formation (of the Lower Member). Host rocks of the West Ba Khe zone belong to the Than Sa Formation. The width of veins changes place to place from a few centimeters up to 6 m. Veins often show a lens-like shape. The main trend of quartz vein systems is E-W to ENE. Two groups of veins - one is steeply dipping to S, and another is gently dipping to S - were distinguished. A small amount of pyrite was seen in quartz veins. A trace of arsenopyrite, pyrrhotite, chalcopyrite, covelline, sphalerite, galena was observed in some part of the veins. Host rocks beside the veins are sheared and slightly altered. The major alteration observed in the country rocks is: silicification, sericitization, and chloritization.

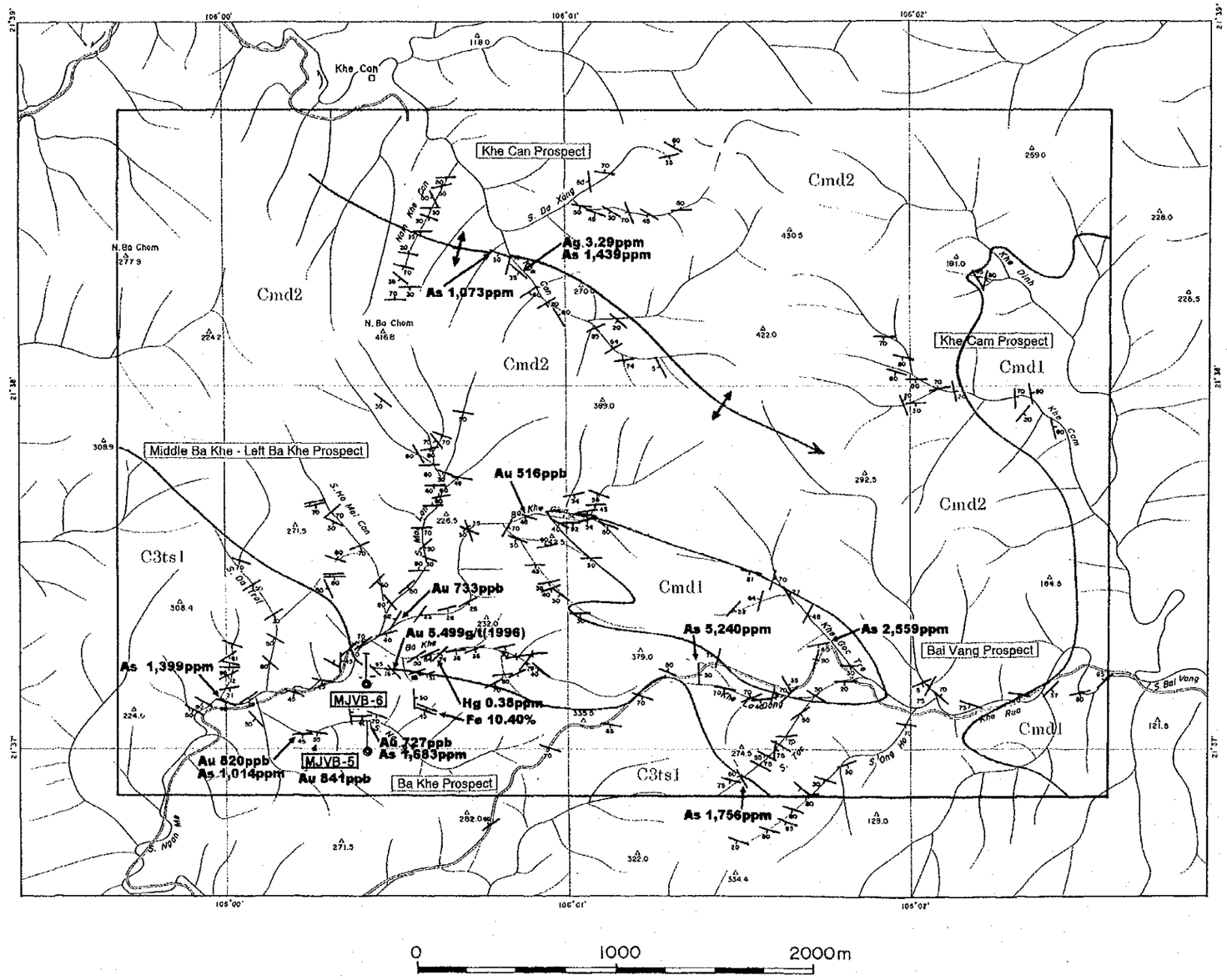
The major prospects in the Ngan Me area are: Ba Khe, Middle Ba Khe-Left Ba Khe, Bai Vang, Khe Can, and Khe Cam. The details of the occurrences of quartz veins in the major prospects are described below. The distribution of gold-bearing quartz veins is shown in Fig. 2-3-2.

Ba Khe Prospect

Many local people are currently working in the Ba Khe prospect. More than one hundred adits, cross-cuts and inclined shafts are distributed in the direction of E-W along the upper reaches of S. Ngan Me and its branch creeks for about 1 km covering Ba Khe (Right Ba Khe creek), Na Hon, upper reaches of Ngan Me main stream and West Ba Khe. Quartz veins are hosted by sericite schist, sandstone and black shale of the Mo Dong Formation. The width of quartz veins changes variously; some part show a lens-like shape. Branching and joining of quartz veins were frequently observed. Major trends of quartz veins are E-W with dips of 45 S.

At the south of Ba Khe over a ridge, there is several people mining places called Na Hon. Most of quartz veins show E-W to WNW-ESE trend with dips of 40 to 70 S. Some show N-S trend with steep E-dip. They are hosted by sandstone, schist and black shale of the Mo Dong and Than Sa (of the Lower Member) Formations. They are interpreted to be parallel veins in the Ba Khe creek.

At the West Ba Khe and along the main stream of S. Ngan Me, quartz veins of mainly E-W system crop out extensively. It is located about 500 m west of Ba Khe. There are two kinds of vein dips: gently S-dip and steeply S-dip. The width changes from a few centimeters up to 3 m. They are



LEGEND

Cambrian
- C3ts1 — Lower Than Sa Formation
- Cmd2 — Mo Dong Formation
  2. Mainly composed of sandstone
- Cmd1
  1. Alternation of schist & sandstone

Fault

Anticlinal Axis

Gold-bearing Quartz Vein

Drill Hole

Fig. 2-3-2 Distribution of Gold-Bearing Quartz Veins in the Ngan Me Area

hosted mainly by sandstone and schist of the Than Sa Formation (of the Lower Member). Local people started mining recently.

Sulfide minerals observed under the microscope in the Ba Khe prospect are: pyrite, arsenopyrite, pyrrhotite, chalcopyrite, covelline, sphalerite, galena, and limonite.

Middle Ba Khe-Left Ba Khe Prospect

Numerous quartz veins occur within an area of 1.5 km (E-W) by 1 km (N-S) located about 500 m north of Ba Khe. It lies over such creeks as Ba Khe Giua (Middle Ba Khe), S. Ho Lon (Left Ba Khe) and S. Ho Mai Con. Most of the quartz veins exhibit E-W trend with dips of 45° S. Some are NE-SW to ENE-WSW trend dipping to S at 20 to 50 degrees. Quartz veins generally show massive features. The width reaches up to 2 m. Some of them contain a significant amount of sulfides - mainly pyrite. A few people's prospecting adits were found.

Bai Vang Prospect

The Bai Vang prospect is located about 2 km east of Ba Khe. Quartz veins are distributed in an area of 1 km by 1 km consisting of Goc Tre creek, La Dong creek, S. Toc and S. Ong Ho. They occur in sandstone and schist of the Mo Dong Formation. The major trend of the quartz veins are E-W. They dip mainly to S steeply (average 56° S). Some of the quartz veins show NE-SW to ENE-WSW with dips of 60 to 80 degrees N. The widths vary from a few centimeters to 2 m. Alluvial mining is carried out by local people in this prospect.

Khe Can Prospect

The Khe Can prospect is located about 2 km north of Ba Khe. Many quartz veins occur along creeks at the northeast of N. Ba Chom whose altitude is 417 m above sea level. They are hosted by sandstone and schist of the Mo Dong Formation. The major trend of the quartz veins is E-W with dips of 35° S. Another trend of NW-SE with dips of 20° N was also observed. The widths are a few centimeters up to 6 m. People's mining activity was not observed.

Khe Cam Prospect

The Khe Cam prospect is located about 3 km northeast of Ba Khe. Tens quartz veins occur along branch creeks of Khe Cam which is one of the branch creeks of Bai Vang. They are hosted by

sandstone and schist of the Mo Dong Formation. The major trend of the quartz veins is ENE with dips of 30° S. The widths of veins are a few centimeters to 2 m. People's mining activity was not observed.

3-2-4 Fluid Inclusion Studies

(1) Methodology

Quartz chips were collected, and provided for fluid inclusion studies. Eleven quartz chips were sampled in the first phase in the semi-detailed survey area. The breakdown is: four from the Da Mai area, three from the Gang area, and four from the Ngan Me area. All samples were taken from quartz veins. Homogenization temperature was measured.

Thirty quartz chips were collected, and provided for fluid inclusion studies in total in the second phase. The breakdown is: nineteen from the Da Mai area, and eleven from the Ngan Me area. All samples were taken from quartz veins. Homogenization temperature and salinity were measured.

The same method of fluid inclusion studies as in the Da Mai area was taken in the Ngan Me area.

(2) Results of Studies

The results of the fluid inclusion studies (morphology, homogenization temperature and salinity) were already explained altogether in the section of the Da Mai area.

3-3 Rock-Chip Geochemical Survey

3-3-1 Sampling and Chemical Analysis

Rock-chip geochemical survey was carried out in the Da Mai and Ngan Me areas in the second phase for the purpose of defining hidden mineralized zones which would otherwise be undetected by geological survey, as well as for clarifying the extensions of mineral occurrences encountered through the geological traverse.

Quartz vein and altered rock samples were collected from every outcrop and some old pits/adits in the survey area. The number of samples collected in the survey was already mentioned in the section of the Da Mai area. The samples of the rock-chip geochemistry were analyzed at the Analytical and Experimental Center, Department of Geology and Minerals of Vietnam for 8 elements: Au, Ag, Cu, Pb, Zn, As, Sb, and Hg. The methods of analysis and limits of detection were already explained in the section of the Da Mai area.

3-3-2 Statistical Data Processing

The same method of statistical data processing as in the Da Mai area was taken in the Ngan Me area. Major analytical results of rock-chip samples are shown in Table 2-3-2. The distribution of major rock-chip geochemical anomalies is shown in Fig. 2-3-3.

3-3-3 Anomalies of Rock-Chip Geochemistry

The followings are the major anomalies detected through the rock-chip geochemistry in the Ngan Me area in the second phase:

Ba Khe prospect: Intensive Au anomalies (up to 841 ppb) occur at Ba Khe and the surrounding locations (Na Hon, S. Ho Mai Can and West Ba Khe) in the Ba Khe prospect. Good correspondence of As anomalies (up to 3,675 ppm) with Au were recognized in these locations in the Ba Khe prospect. Pb and Hg (up to 0.38 ppm) anomalies also found at Ba Khe.

Middle Ba Khe-Left Ba Khe prospect: Several Au anomalies was detected at Middle Ba Khe and Left Ba Khe. Pb and As anomalies also occur at these locations.

Table 2-3-2 Major Analytical Results of Rock-Chip Geochemical Samples in the Ngan Me Area (1)

Ser. No.	Sample No.	Width (cm)	Au (ppb)	Ag (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)	As (ppm)	Sb (ppm)	Hg (ppm)	Location
1	A116	10	7	0.12	21	22	12	1377	10	<0.03	Ho Mai
2	A122	--	26	0.65	40	397	40	51	9	<0.03	Ho Mai
3	A126	20	72	0.60	43	28	17	3675	25	<0.03	Ho Mai
4	A129	8	3	0.07	15	10	12	163	3	<0.03	Ho Mai
5	A131	80	3	1.40	338	231	18	178	15	<0.03	Ho Mai
6	A136	10	39	0.04	19	8	20	18	5	<0.03	Ho Mai
7	A139	20	33	0.53	38	81	39	71	9	<0.03	S. Ngan Me
8	A140	15	83	0.17	16	13	13	32	6	<0.03	S. Ngan Me
9	A141	20	158	2.44	102	119	47	1399	10	<0.03	S. Ngan Me
10	A142	10	49	0.14	47	25	20	84	8	<0.03	Na Hon
11	A143	25	820	1.92	19	323	7	1014	7	<0.03	Na Hon
12	A144	55	841	0.28	22	1	13	917	8	<0.03	Na Hon
13	A145	7	264	0.43	43	9	17	67	7	<0.03	Na Hon
14	A146	15	727	0.25	21	12	10	1683	7	<0.03	Na Hon
15	A147	15	102	0.06	18	7	8	97	5	<0.03	Na Hon
16	A154	3	269	0.07	28	20	20	938	9	<0.03	S. Ngan Me
17	A155	30	37	0.14	22	12	25	39	7	<0.03	S. Ngan Me
18	A157	112	131	0.28	32	21	25	56	7	<0.03	S. Ngan Me
19	A158	10	33	0.07	53	39	56	237	12	<0.03	S. Ngan Me
20	A159	5	55	0.13	25	9	17	68	9	<0.03	Ho Mai
21	A160	4	70	0.10	30	23	28	105	5	<0.03	Ho Mai
22	A161	200	18	0.09	92	50	23	148	12	<0.03	Ho Mai
23	A162	20	40	0.54	82	19	18	149	12	<0.03	Ho Mai
24	A169	300	26	0.33	74	31	51	407	3	<0.03	Da Voi
25	A171	8	110	0.35	44	41	35	135	12	<0.03	Da Voi
26	A172	20	30	0.14	33	35	9	200	2	<0.03	Da Voi
27	A181	--	16	<0.04	43	12	120	32	2	<0.03	Ong Ho
28	A183	30	11	1.71	71	603	53	109	7	0.04	Stok
29	A184	10	33	0.26	90	10	13	19	4	<0.03	Stok
30	A189	80	145	0.33	61	41	71	1756	44	<0.03	Stok
31	A190	10	81	0.29	34	36	63	144	8	<0.03	Stok
32	A191	10	10	0.22	97	38	40	57	7	<0.03	Da Xang
33	A196	10	10	0.54	69	41	23	177	6	<0.03	Da Xang
34	A207	30	10	0.12	43	23	61	156	2	<0.03	Khe Can
35	A209	80	5	0.58	77	69	45	45	2	<0.03	Khe Can
36	B097	50	1	0.65	45	69	18	142	6	<0.03	Ba Khe
37	B099	100	9	0.06	41	19	134	65	4	<0.03	Ba Khe
38	B101	20	16	0.06	22	18	18	288	9	<0.03	Ba Khe
39	B102	30	3	0.14	125	61	43	64	10	<0.03	Ba Khe
40	B103	20	18	0.17	24	23	15	684	17	<0.03	Ba Khe
41	B105	30	9	0.41	59	204	36	71	9	<0.03	Ba Khe
42	B106	20	17	0.05	42	46	38	146	7	<0.03	Ba Khe
43	B108	100	7	0.37	68	33	123	187	8	<0.03	Ba Khe
44	B112	8	516	0.36	25	90	29	1914	9	<0.03	Ba Khe
45	B114	20	36	0.07	28	24	43	289	7	<0.03	Ba Khe
46	B116	25	15	0.13	57	34	27	415	5	0.03	Ba Khe
47	B121	7	45	0.09	19	16	17	72	8	0.08	Ba Khe

Table 2-3-2 Major Analytical Results of Rock-Chip Geochemical Samples in the Ngan Me Area (2)

Ser. No.	Sample No.	Width (cm)	Au (ppb)	Ag (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)	As (ppm)	Sb (ppm)	Hg (ppm)	Location
48	B122	8	150	0.23	30	17	52	409	7	0.38	Ba Khe
49	B124	20	67	0.11	50	61	39	646	7	0.06	Ba Khe
50	B125	15	30	0.06	16	10	9	61	8	0.03	Ba Khe
51	B128	30	2	0.08	33	9	5	41	6	0.04	Ba Khe
52	B129	10	36	0.10	44	27	55	314	8	0.04	Ba Khe
53	B131	5	96	0.15	37	30	16	159	6	<0.03	Ba Khe
54	B132	70	18	0.07	40	37	29	211	7	0.03	Dong
55	B138	40	19	0.27	133	34	14	5	4	<0.03	Along new road
56	B139	30	20	0.13	26	26	16	198	6	<0.03	Along new road
57	B140	20	46	0.81	46	305	54	2559	39	<0.03	On new road
58	B141	50	68	0.27	23	19	10	19	3	<0.03	On new road
59	B142	30	5	0.07	84	671	6	5240	6	<0.03	On new road
60	B143	75	160	1.29	45	102	18	270	10	<0.03	On new road
61	B146	20	20	0.08	34	23	15	489	13	<0.03	New road
62	B149	15	9	0.16	22	24	18	834	31	<0.03	Goc Tro
63	B155	10	63	0.07	29	19	22	10	2	<0.03	Khe Can
64	B156	30	3	0.21	118	34	44	1073	7	<0.03	Khe Can
65	B157	100	20	3.29	44	526	24	1439	9	<0.03	Khe Can
66	B163	40	38	1.00	41	115	16	31	7	<0.03	Khe Can
67	B164	50	7	0.25	34	109	38	39	4	<0.03	Khe Can
68	B177	300	3	0.15	22	111	11	99	7	<0.03	Khe Rua

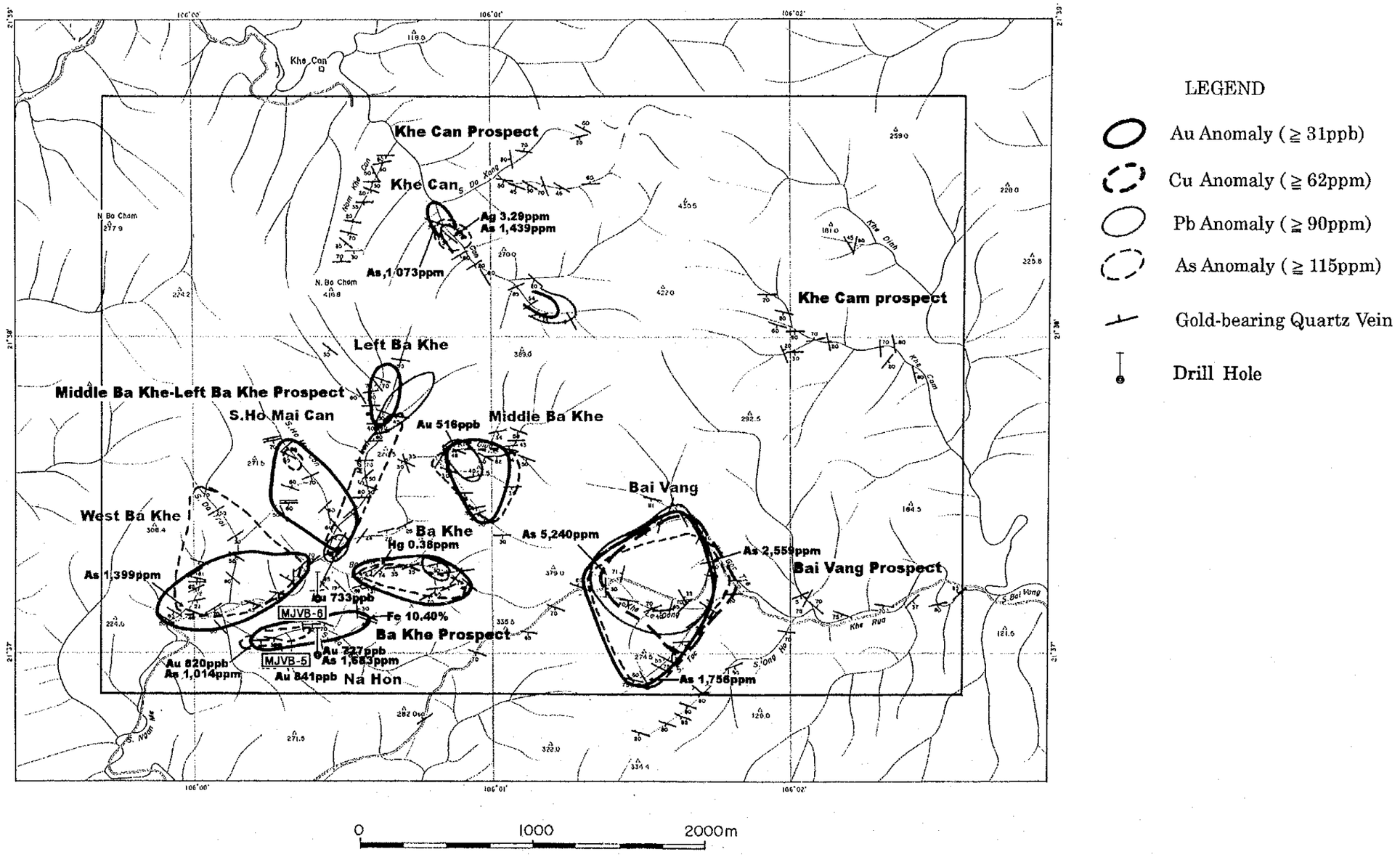


Fig. 2-3-3 Distribution of Rock-Chip Geochemical Anomalies in the Ngan Mei Area

3-4 Geophysical Survey (CSAMT Method)

3-4-1 Outline of Survey

Geophysical survey using CSAMT method was carried out in the Da Mai, Gang and Ngan Me areas in the first phase. The objectives of the survey were to investigate the relationship between resistivity and geologic structure and to extract resistivity anomalies related to mineralization. The Array CSAMT method was employed in this survey.

Amounts of the survey were as follows.

- •Total length of survey lines: 30 km
- •Survey points: 330 points
- •Laboratory test samples: 20 pcs

3-4-2 Survey Method

(1) Methodology

The same method as in the Da Mai area was taken in the Ngan Me area.

(2) Field Survey

Two sets of transmitting dipole were laid out as shown in a figure in the first phase report. The transmitting dipole No. 1 located approximately 6 km west of the Da Mai area was applied to the measurement of this area. The current electrode No. 2 located approximately 5 km west of the Gang area was applied to the measurement of the Gang and Ngan Me areas. Both dipoles are N-E in direction and about 1.6 km in spacing.

The survey lines (1 km in length, N-E in direction and 200 m in interval) were laid out as shown in figures in the first phase report.

The spacing of measuring points and potential electrodes are 100 m. Ten frequencies of 4, 8, 16, 32, 64, 128, 256, 512, 1,024, and 2,048 Hz were measured. Maximum 6 points were simultaneously measured.

The equipment used in this survey is shown in a table in the first phase report.

Bai Vang prospect: A series of Au anomalies are distributed along the upper reaches of Bai Vang. Several basemetal anomalies (Cu, Pb up to 671 ppm, As up to 5,240 ppm, Sb up to 45 ppm and Fe) are associated with Au anomalies in the Bai Vang prospect.

Khe Can prospect: A few Au anomalies were found along Khe Can. Anomalies of Pb and As were also detected near the Au anomalies.

(3) Laboratory Test

Resistivity and chargeability of rock samples in the survey areas were measured in laboratory. The same method as in the field measurement was applied. More than twenty samples were measured in laboratory for three areas in total.

(4) Analytical Method

The same analytical method for the following items as in the Da Mai area was applied in the Ngan Me area:

- •Pseudosection of Apparent Resistivity
- •Contour Map of Apparent Resistivity
- •1-D Inverse Analysis
- •Resistivity Structure Section (1-D Inverse Analysis)
- •2-D Inverse Analysis
- •Resistivity Structure Section (2-D Inverse Analysis)
- •Resistivity Structure Map (2-D Inverse Analysis)
- •Integrated Interpretation Map

3-4-3 Results of Field Survey

(1) Apparent Resistivity

The pseudosections of the apparent resistivity of every line are shown in figures in the first phase report and the contour maps of apparent resistivity of 3 frequencies (1,024, 128 and 16 Hz) are shown in figures in the first phase report. The apparent resistivity in the Ngan Me area tend to become relatively high in the high frequencies and to decrease as frequency decreases. The Ngan me area showed the lowest resistivity of the three areas. The horizontal change of the apparent resistivity is relatively large in the pseudosections.

The apparent resistivity of 1,024 and 128 Hz show the similar distribution. The representative resistivity of each frequency are 1,000 to 2,000 ohm-m in 1,024 Hz, 500 to 1,000 ohm-m in 128 Hz, and 200 to 500 ohm-m in 16 Hz. On the whole, the direction of the resistivity distribution is the same E-W according to the topography as the other areas. In the map of 1,024 Hz, the high resistivity zones more than 5,000 ohm-m were detected in the southern part of lines N-4 to N-6.

(2) Resistivity Structure (1-D Analysis)

The resistivity structure sections drawn with the 1-D analysis are shown in figures in the first phase report. On the whole, these sections show the resistivity distribution similar to the pseudsections. The resistivity structure is little continuous in these sections.

(3) Resistivity Structure (2-D Analysis)

The resistivity structure sections drawn with the 2-D analysis are shown in figures in the first phase report. The resistivity structure maps of 3 levels (SL 100m, SL 0m and SL -200m) are shown in figures in the first phase report. Removing the topographic effect (low resistivity in the ridge parts and high resistivity in the valley part were reduced) made the resistivity distribution more smooth than the apparent resistivity distribution. The analysis gave the lowest resistivity of the three areas. On the whole, the resistivity in the eastern part is higher than that in the western part and the resistivity in the shallow zone is higher than that in the deep zone. The low resistivity areas less than 500 ohm-m will continue from the eastern part of the Gang area.

The high resistivity zones more than 5,000 ohm-m were detected in the southern part of line N-5 and the middle part of line N-2. Especially, the high resistivity zone in southern part of line N-5 extends to the deeper zone. The vertical zone with low resistivity less than 50 ohm-m was detected from No. 8 on line N-1 to No. 10 on line N-2.

3-4-4 Laboratory Test

The results of the laboratory test were already explained in the section of the Da Mai area.

3-4-5 Integrated Interpretation

(1) Resistivity Features

The laboratory test results and geologic information led to the following resistivity features about the rocks and geologic structure in the survey areas.

1) High Resistivity

In the survey areas, the group of quartz veins and the granite are assumed to form higher resistivity than the host rock.

The quartz vein containing few fissures is extremely high (more than 10,000 ohm-m) in resistivity. However, it is very difficult to extract narrow high resistivity zone in width by this measurement system. In the case of the zone where many quartz veins are concentrated (the group of quartz veins), it is sufficiently possible to extract a high resistivity zone related to quartz veins. MT method is not much sensitive to high resistivity. Thus, the width of the group of quartz veins is expected to be more than 100 m if a high resistivity zone related to quartz veins is extracted by this measurement system. When fractures develop in the group of quartz veins, it is possible that the resistivity of the group is lowered and a high resistivity zone related to quartz veins is not extracted.

When the samples of granite were weathered and cataclastic, they had the same resistivity (1,734 ohm-m) as the host rock. When the granite is fresh in deep zone, it seems that granite is several times higher in resistivity and a high resistivity area related to granite is extracted.

The laboratory test shows that the existence of the other rocks might not form higher resistivity.

2) Low Resistivity

In the survey areas, claystone and siltstone, fracture zone and the layer containing graphite are assumed to form lower resistivity than the host rock.

The laboratory test showed that claystone, siltstone and one of the shale had the lowest resistivity (about 600 ohm-m). When fractures exist in these rocks, they lower further their resistivity..

In fracture zones, low resistivity zones are generally extracted, because they are high permeable (high conductible) . Many of fracture zones have a figure lower resistivity less than host rock.

Graphite has extremely low resistivity less than several ohm-m. The resistivity of the layer containing graphite is lowered depending on its content.

(2) Relations to Geologic Structure

The figure arranged the resistivity structure sections (2-D analysis) in the sequence of the lines is shown in a figure in the first phase report to grasp three dimensional resistivity structure. The followings are the geological interpretation to resistivity structure in the Ngan Me area on the basis of the above resistivity features.

Resistivity structure :The resistivity is lowest of the three areas. The low resistivity areas in the western part will continue from the eastern part of Gang area. The high resistivity zones were detected in the southern part of line N-5 and the middle part of line N-2. The high resistivity zone in the southern part of line N-5 extends to the deeper zone. The vertical zone with low resistivity less than 50 ohm-m was detected from No. 8 on line N-1 to No. 10 on line N-2.

Interpretation: Since the host rocks in this area is relatively low, the high resistivity zone related to quartz veins is assumed to be extracted apparently smaller than in the other areas. The high resistivity zones noted above seems to result from the group of quartz veins. Especially, the zone in the southern part of line N-5 extends to the deeper zone with steep dip and is expected to extend to the east. The low resistivity zone seems to be attributed to fracture zone.

(3) IP Method

The laboratory test results gave the obvious contrast between the quartz vein containing pyrite and the other rocks in the survey areas. When the IP method is applied to this areas, it is graphite that adversely affects the data. The laboratory test showed that the IP effect is small, in the case of containing few amounts of graphite. If a layer contains a considerable amount of graphite, the CSAMT method sensitive to low resistivity should extract a low resistivity area because of the extremely low resistivity (less than several ohm-m) of graphite.

Consequently, it is considered that the high resistivity zones extracted by this survey contain few amounts of graphite and IP response is little affected in these zones. Thus, the IP method is available for these high resistivity zones in order to delineate prospective parts.

Since the CSAMT method is not much sensitive to high resistivity and this measurement was carried out with the potential electrode spacing of 100 m, the resistivity distribution related to the mineralization was not able to determine with sufficient accuracy. From this standpoint also, it is significant to carry out the IP method sensitive to high resistivity with high density.

The result of the integrated interpretation is shown in Fig. 2-3-4.

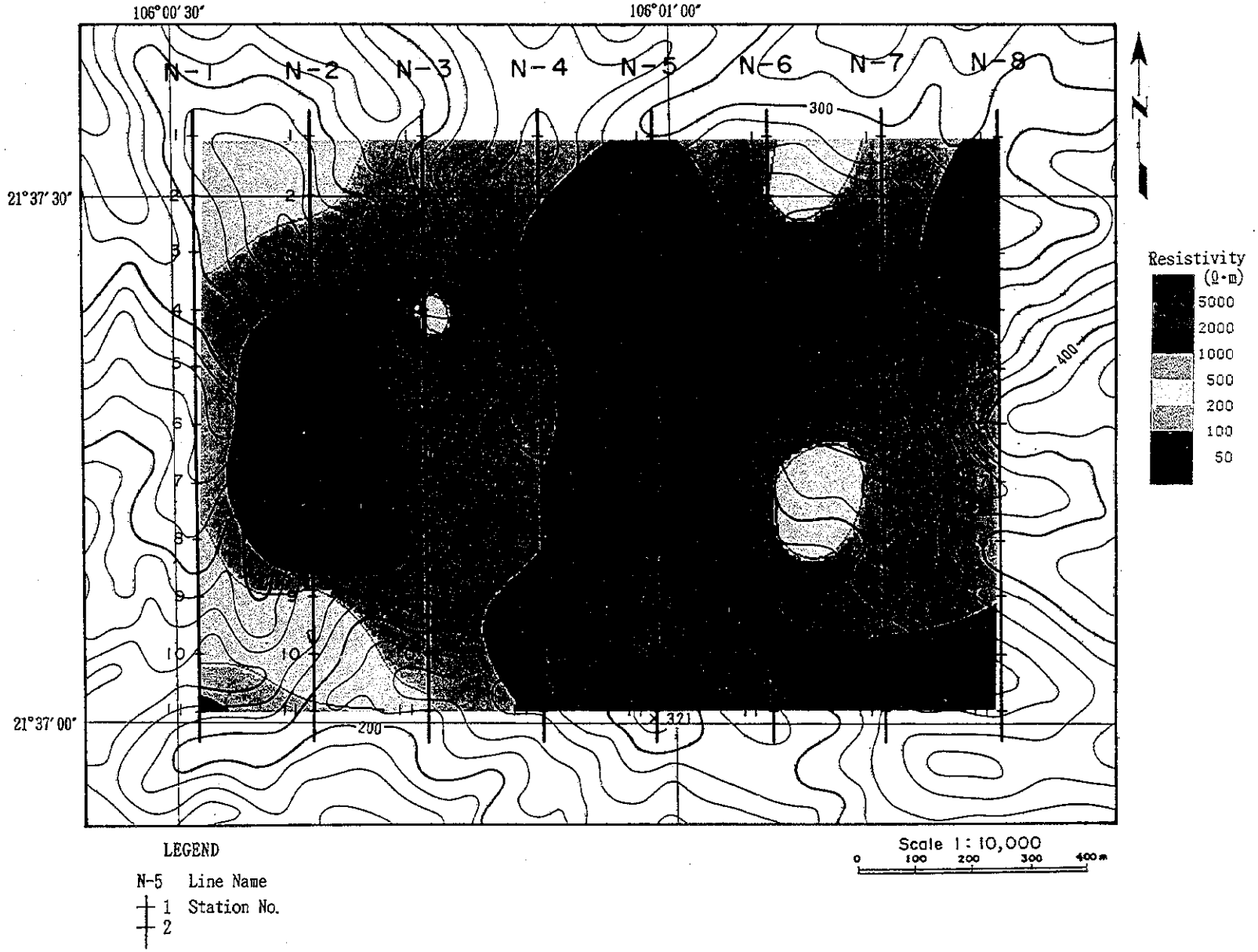


Fig. 2-3-4 Distribution of Geophysical Anomalies (CSAMT Method) in the Ngan Me Area

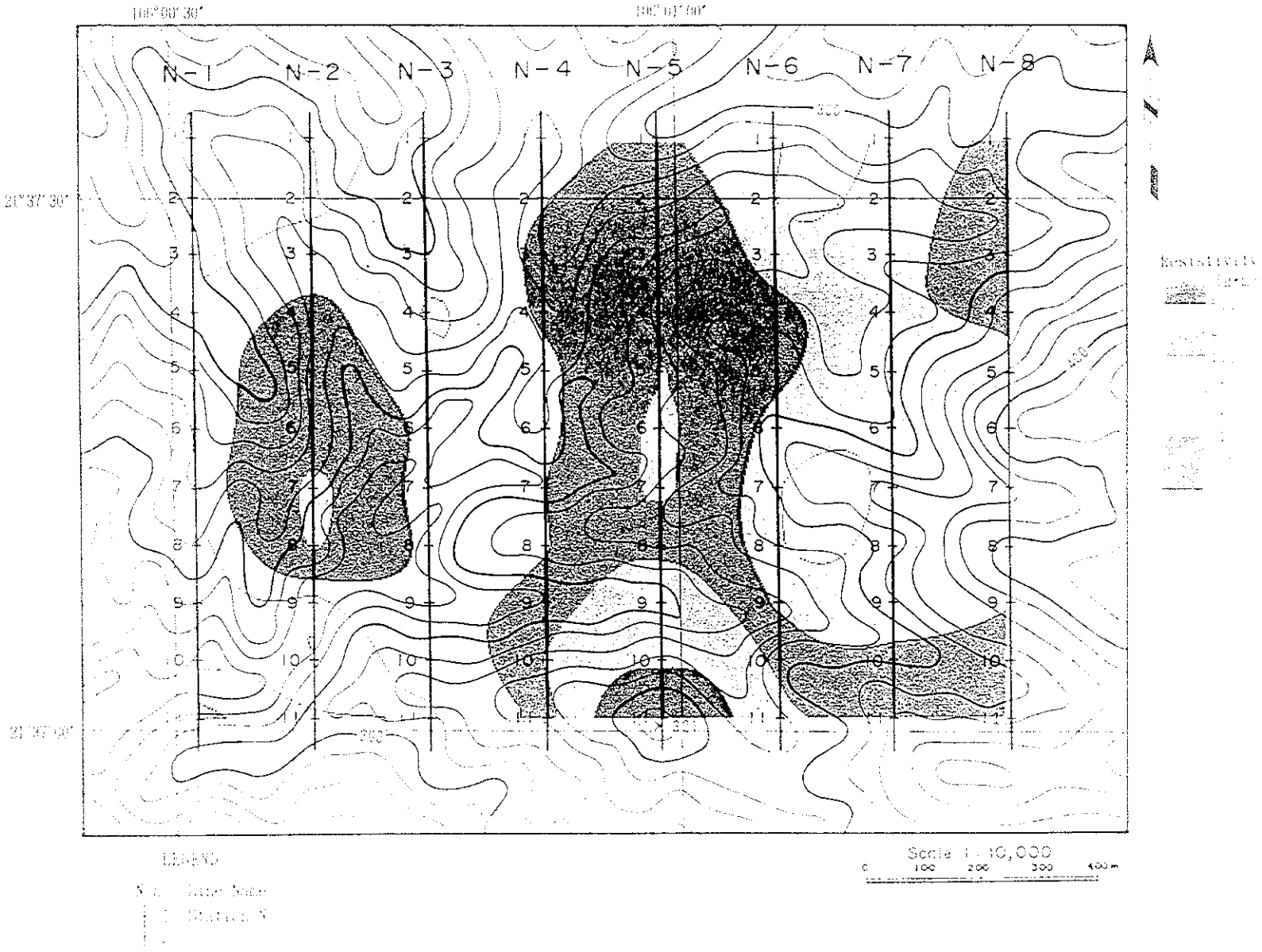


Fig. 2-3-4 Distribution of Geophysical Anomalies (CSAMT Method) in the Ngan Me Area

3-5 Geophysical Survey (IP Method)

3-5-1 Outline of Survey

Geophysical survey using Time Domain IP method was carried out in the second phase in the Da Mai and Ngan Me areas. The objectives of the survey were to extract IP anomalies related to mineralization and to investigate the relationship between geophysical and geologic structure in the survey area. These results provided a base for the selection of drilling site.

Amounts of geophysical survey were as follows.

	Da Mai Area	Ngan Me Area	Total
•Total length of survey lines	10 km	10 km	20 km
•Survey points	800 points	800 points	1,600 points
•Laboratory test samples			20 pcs

3-5-2 Survey Method

(1) Methodology

The same method as in the Da Mai area was taken in the Ngan Me area.

(2) Field Survey

The survey lines (1 km in length, N-E in direction and 100 m in interval) were laid out as shown in figures in the second phase report. The same specifications of measurement and equipment as in the Da Mai area were applied in the survey in the Ngan Me area.

(3) Laboratory Test

Resistivity and chargeability of rock samples in the survey areas were measured in laboratory. The same method as in the field measurement was applied. Twenty samples were measured in laboratory for two areas in total.

(4) Analytical Method

The same analytical method for the following items as in the Da Mai area was applied in the Nga Me area:

- •Apparent Resistivity Pseudosection
- •Apparent Resistivity Map
- •Apparent Chargeability Pseudosection
- •Apparent Chargeability Map
- •2-D Inversion
- •Resistivity Section
- •Resistivity Map
- •Chargeability Section
- •Chargeability Map
- •Integrated Interpretation Map

3-5-3 Results of Field Survey

(1) Observed Data

1) Apparent Resistivity

The pseudosections of the apparent resistivity of every line are shown in figures in the second phase report and the maps of the apparent resistivity of n=1, 3 and 5 are shown in figures in the second phase report. The apparent resistivity in the Ngan Me area is a wide range from 6 to 6,000 ohm-m and is obviously lower in the deeper zone. High resistivity more than 1,000 ohm-m is predominantly distributed in the map of n=1 and low resistivity less than 100 ohm-m is predominantly distributed in the map of n=5. The mean value in the Ngan Me area is about 250 ohm-m and lower than that in the Da Mai area. In the map of n=5, high resistivity areas more than 1,000 ohm-m emerge mainly in the ridge parts. It seems to be due to the topographic effect.

2) Apparent Chargeability

The pseudosections of the apparent chargeability of every line are shown in figures in the second phase report and the maps of the apparent resistivity of n=1, 3 and 5 are shown in figures in the second phase report. The apparent chargeability in the Da Mai area is mostly higher than 10 mV/V

and therefore the background value of chargeability in this area is higher than that in the Da Mai area. The strong chargeability anomaly areas more than 30 mV/V were detected everywhere. The strong anomalies more than 40 mV/V were detected in the central part of lines N-IP-1 to N-IP-3 and the southern part of lines N-IP-3 to N-IP-4.

(2) Analytic Results (2-D Inversion)

1) Resistivity

The resistivity sections drawn with the 2-D inversion are shown in figures in the second phase report. The resistivity maps of 3 levels (SL 150 m, SL 100 m and SL 50 m) are shown in figures in the second phase report. The resistivity in the Ngan Me area is lower than that in the Da Mai area, as a whole. High resistivity more than 1,000 ohm-m is predominantly distributed in the shallow zone and high resistivity more zones than 3,000 ohm-m were detected everywhere. The resistivity in this area is lower in the deeper zone. These tendencies harmonize with the results of CSAMT method carried out on the first phase survey.

The resistivity structure in Ngan Me area is complex. Vertical low resistivity zones were extracted in all the lines. These low resistivity zones tend not to continue clearly. However, it could be considered that the low resistivity zone around the 600 m of lines N-IP-7 to N-IP-10 exhibits a E-W direction and the ones in the western part of the survey area exhibits a NW-SE direction.

2) Chargeability

The chargeability maps drawn with the 2-D inversion are shown in figures in the second phase report. The resistivity maps of 3 levels (SL 150 m, SL 100 m and SL 50 m) are shown in figures in the second phase report. The chargeability in the Ngan Me area is higher than that in the Da Mai area. The background value of chargeability in this area seems to be 10 to 20 mV/V.

The broadest strong chargeability anomaly zone was extracted in the southern part of the survey area. This anomaly zone extends for lines N-IP-2 to N-IP-9 in a E-W direction and includes high chargeability more than 40 mV/V in the lines N-IP-1 to N-IP-2 and lines N-IP-8 to N-IP-9. This anomaly zone tends to incline to the south and disappear in the deep zone below SL 50m. The second broadest strong anomaly zone was extracted in the central part of lines N-IP-1 to N-IP-2. This anomaly zone also includes high chargeability more than 40 mV/V and tends not to extend in the deep zone below SL 0m. The other strong anomaly zones more than 30 mV/V are scattered in the northeastern part of the survey area.

The resistivity in the strong chargeability anomaly zones is medium value. Low resistivity zones tend to be distributed in the vicinity of the strong anomaly zones.

3-5-4 Laboratory Test

The results of the laboratory test were already explained in the section of the Da Mai area.

3-5-5 Integrated Interpretation

(1) Relationship between Resistivity and Mineralization

The analytic results, laboratory test results and geologic information led to the following relationship between resistivity and mineralization in the survey areas.

The quartz vein is extremely high (more than 10,000 ohm-m) in resistivity. However, it is very difficult to extract a narrow quartz vein in width by this measurement system. In case where a group of quartz veins is large in size, it is possible to extract a high resistivity zone related to quartz veins.

The development of fractures and content of sulfide minerals lower the resistivity of a zone where quartz veins are distributed, as shown in the laboratory test results. In many cases, small quartz veins contribute to increasing the resistivity obtained by this measurement system. Therefore, the resistivity of a zone where quartz veins are distributed seems to be almost the same as or higher that in the host rock, that is, from medium to high in the survey areas.

(2) Relationship between Chargeability and Mineralization

The analytic results, laboratory test results and geologic information led to the following the relationship between chargeability and mineralization in the survey areas.

In the survey areas, sulfide minerals (mainly pyrite) and graphite are assumed to cause chargeability anomalies. From a geological viewpoint, the rocks in the survey areas contain few amounts of graphite. Therefore, chargeability anomalies result from sulfide minerals (mainly pyrite) accompanying quartz veins. The laboratory test results show that the chargeability value is obviously correlated with the content of sulfide minerals (mainly pyrite).

In the survey areas, it follows from these that a strong chargeability anomaly zone is connected with the zone where quartz veins containing a considerable amount of sulfide minerals are distributed. In case where the chargeability of the host rocks is low, there is a high possibility that a weak chargeability anomaly is the zone where quartz veins containing a small amount of sulfide minerals are distributed.

(3) Relationship between Geophysical Anomaly and Mineralization

In the survey areas, the above discussion gives the followings to the IP anomalies extracted

in a zone where quartz veins are distributed.

- Strong chargeability anomaly
- Weak chageability anomaly
- High resistivity anomaly

Strong chargeability anomaly is highly related to a distribution of quartz veins and connected with a distribution of quartz veins containing a considerable amount of sulfide minerals. Weak chargeability anomaly is expected that quartz veins containing a small amount of sulfide minerals are distributed, in case where the chargeability of the host rocks is low. High resistivity anomaly may be expected that a large group of quartz veins is distributed.

In the following, the relationship between these anomalies extracted in the Ngan Me area and the known prospects are discussed.

The distributions of the strong chargeability anomaly zone, high resistivity zone and known quartz veins were shown in a figure in the second phase report. The strong chargeability anomaly was regarded as more than 30 mV/V. The high resistivity anomaly was regarded as more than 3,162 ohm-m. The strong chargeability anomaly zones were plotted with the chargeability maps of 3 levels (SL 150 m, SL 100 m and SL 50 m). The high resistivity zones were plotted with the resistivity distribution of the surface, since high resistivity is mostly distributed in the surface. The weak chargeability anomaly zone was not done, because the background value (10 to 20 mV/V) of chargeability in this is relatively high. The locations and features of anomaly zones, and the relation to the known prospects are as follows.

Strong Chargeability Anomaly

- Southern part of lines N-IP-2 to N-IP-9

This anomaly zone is the broadest in the Ngan Me area. It includes high chargeability more than 40 mV/V in lines N-IP-1 to N-IP-2 and lines N-IP-8 to N-IP-9. It has a E-W direction, and tends to incline to the south and disappear in the deep zone below SL 50m. It seems to be attributed to groups of quartz veins containing a large amount of sulfide minerals in the Ba Khe prospect around the Na Hon stream. It shifts slightly toward the south of the known quartz veins.

- Central part of lines N-IP-1 to N-IP-2.

This anomaly zone is the second broadest in this area and includes high chargeability more than 40 mV/V. It tends not to extend in the deep zone below SL 0m. It seems to be attributed to groups of quartz veins containing a large amount of sulfide minerals in the Ba Khe prospect around the

Ba Khe stream. The known quartz veins are distributed around this anomaly zone.

· Northeastern part of the survey area

Small anomaly zones are scattered. It seems to be attributed to groups of quartz veins containing a large amount of sulfide minerals in the Middle Ba Khe - Left Ba Khe prospect.

High Resistivity Anomaly

Broad high resistivity anomaly zones are distributed in the ridge parts located a little to the south of the survey area. They are distributed up to 50 m from the surface in depth. Their distributions could not conform to those of the known quartz veins.

(4) Relations to Geologic Structure

In the Ngan Me area, the resistivity structure is complex and vertical low resistivity zones were extracted in all the lines. These low resistivity zones tend not to continue clearly. It seems that the resistivity structure reflects the complex geologic structure and the low resistivity zones result from fracture zones.

The chargeability distribution in these areas tends not to be related to the geologic structure specifically, except for the distribution of quartz veins.

The result of the integrated interpretation is shown in Fig. 2-3-5.

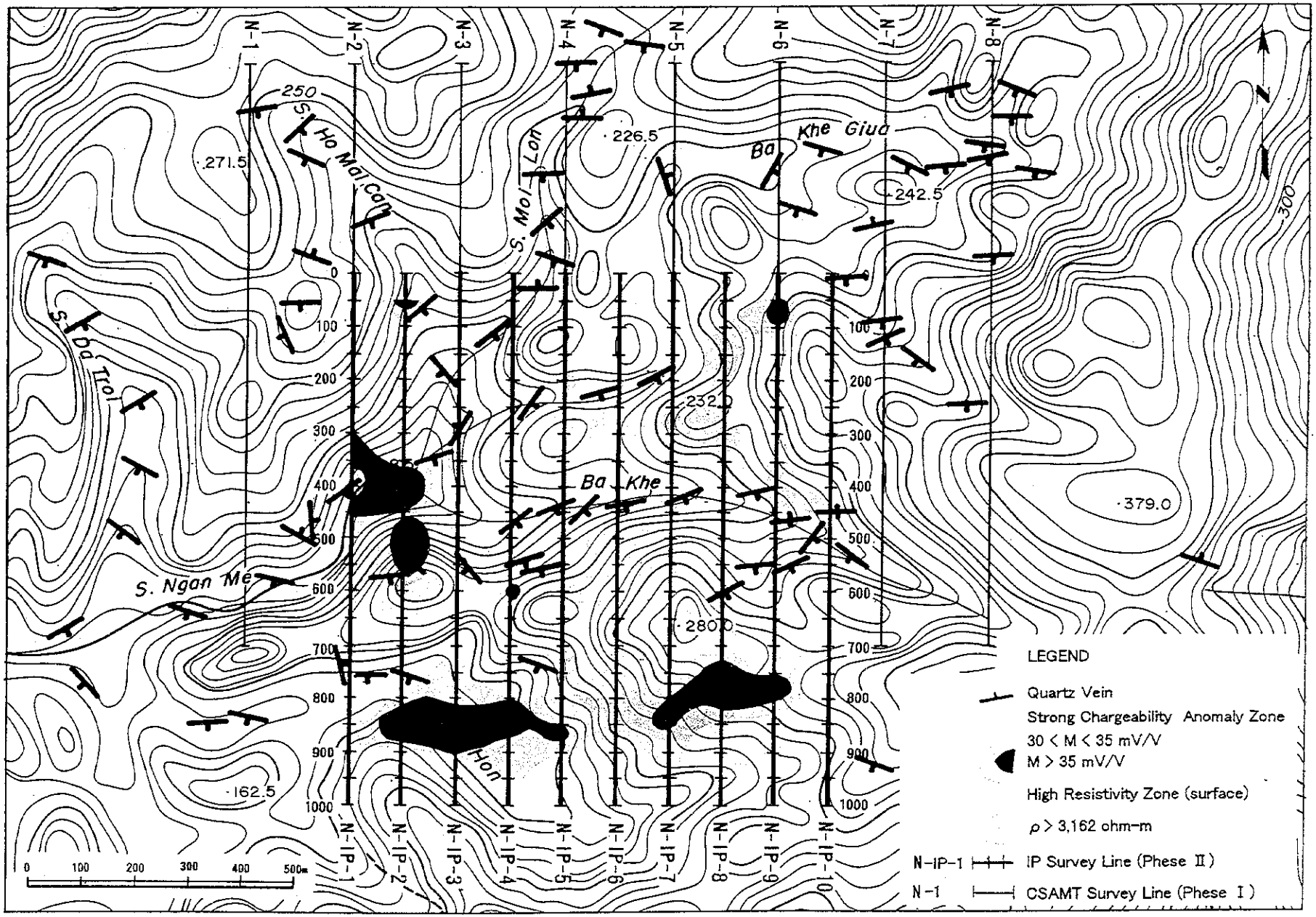


Fig. 2-3-5 Distribution of Geophysical Anomalies (IP Method) in the Ngan Me Area

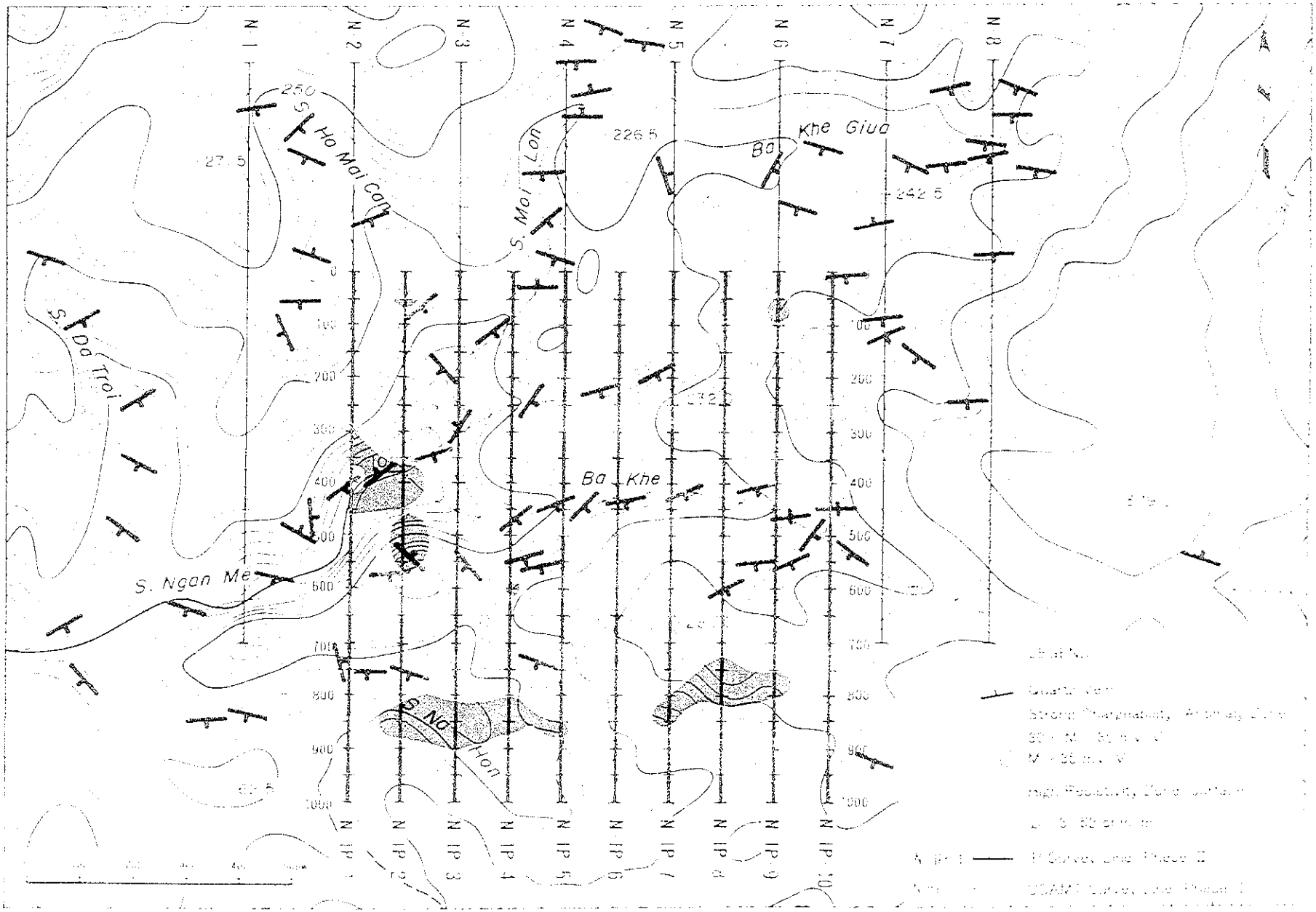


Fig. 2-3-6 Distribution of Geophysical Anomalies (IP Method) in the Ngan Me Area

3-6 Drilling (Phase III)

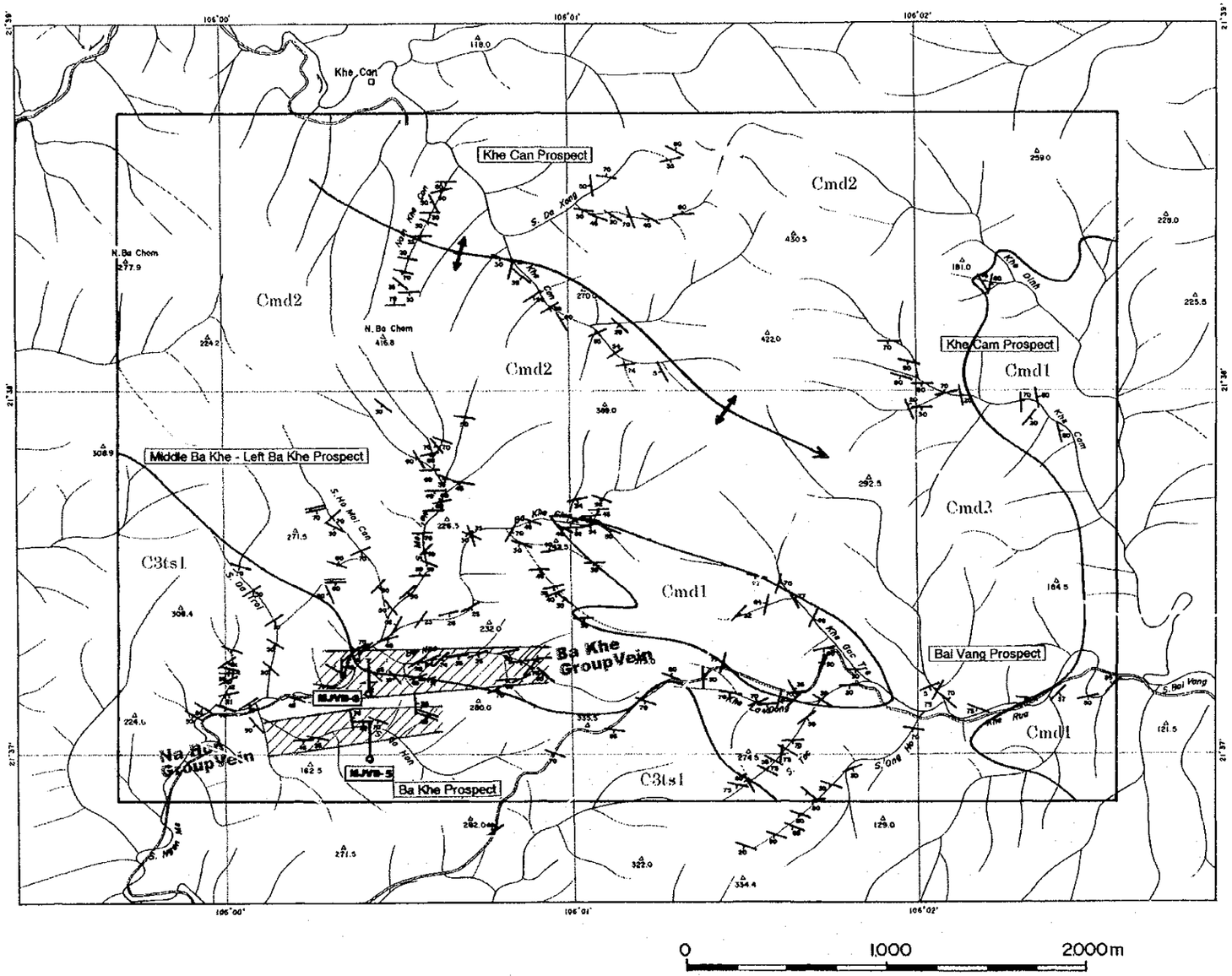
3-6-1 Outline of Drilling

In the third phase, a diamond drilling program comprising two holes totaling 600 m was planned in the Ngan Me area. These holes were directed towards the significant geological/geochemical and geophysical anomalous zones. Significant gold mineralized zones at the Da Mai- Khe Dui prospect, which were defined by geological/geochemical and IP geophysical surveys were targeted by two holes -- MJVB-5 and 6.

The drilling program was composed of two inclined holes of 300 m deep each. Target depths were set at 50 to 250 m from the surface. Two holes of 600.00 m in total length have been drilled in this phase. Details of each hole are summarized in the table below. The location map of drill holes is shown in Fig. 2-3-6.

Hole No.	Area & Prospect	Location	Latitude (N)	Longitude (E)	Ele-vation (m)	Azi-muth	Incli-nation (°)	Length (m)
MJVB-5	Ba Khe (Ngan Me Area)	Na Hon Creek	21°36'59"	106°00'26"	200	N	-45	300.00
MJVB-6	Ditto	Ba Khe Creek	21°37'11"	106°00'26"	200	N	-45	300.00
Total	2 holes							600.00

A series of drill logs of 1:200 scale was prepared, and the whole drill cores were photographed in color. A total of 101 samples for ore assay was obtained. Six elements (Au, Ag, Cu, Pb, Zn and Fe) were analyzed for ore assay. Twenty polished sections for ore microscopy and twenty thin sections for petrography were produced from the cores. Twenty-one altered rock and quartz samples were examined for X-ray powder diffraction analysis. Ten quartz samples were provided for fluid inclusion studies. (The amounts of samples are total both in Da Mai and ngan Me)



LEGEND

Quaternary	Q	Alluvial Deposits
Devonian	D1ml	Mia Le Formation
	D1bb	Bac Bun Formation
Cambrian	C3ts1	Lower Than Sa Formation
	Cmd2	Mo Dong Formation 2. Mainly composed of sandstone
	Cmd1	1. Alternation of schist & sandstone

Fault

Anticlinal Axis

Synclinal Axis

Gold-bearing Quartz Vein

Group of Vein

Drill Hole (Phase III)

Fig. 2-3-6 Location Map of Drill Holes in the Ngan Me Area

3-6-2 Method, Equipment and Progress

(1) Method and Equipment

Method

For the near-surface weathered zone (2 to 4 m), drilling was normally done by PQ size metal bit (132 mm in diameter) with inserting of PW drive pipes (146 mm in inner diameter). Weakly weathered bedrock and the upper part of bedrock zone (down to 100 to 150 m) were drilled by the conventional drilling method using HQ size diamond bit (91 mm in diameter). The weakly weathered bedrock continued to 20 to 40 m deep. Reaming at 117 mm in diameter was done by using diamond or metal bit, and HW casing pipes (108 mm in inner diameter) were inserted in this zone. For the upper part of bedrock zone, NW casing pipes (89 mm in inner diameter) were inserted down to approximately 100/150 m. From 100/150 m to 300 m (the end of hole), drilling was made with NQ size diamond bit (76 mm in diameter) and NQ-WL core tube. Bentonite clay, polymer (CMC) and NaOH (pH adjustment agent) were usually mixed in the circulating drilling water. When the water was lost at a depth where fractures were developed, a natural fibrous material (commercial name is GPC made in China) was injected to recover the trouble. When the fracture was significantly wide, half-solid bentonite clay was inserted. In the case of MJVB-6 in which some old workings were caught during drilling, the cementation and casing method was applied to recover the circulating water.

Equipment

A set of Russian ZIF-650M drilling machine, a set of Long-Year L-38 drilling machine and two sets of Russian NB-3 drilling pumps were brought into operation in this exploration. One drill rig was a Vietnamese domestic-made angled tripod-type for the ZIF-650M machine. Another one was a ladder-type rig equipped with the L-38 machine. Specifications of drilling machine and equipment are shown in Table 2-2-4. Diamond bits and expendable items used during the drilling are listed in tables in the third phase report.

Working System

Drilling operation was carried out by three shifts per day (8 hours per shift), while the appurtenant works, such as rig construction, mobilization and demobilization, were done by one shift per day (8 to 10 hours). A shift crew consisted of one drilling engineer and three to four workers normally. Additional twenty workers (round figures) were involved in case of the appurtenant work. A series of base camps for drilling operation were built at the foot of creeks.

Transportation

The drilling machine and equipment were transported to the survey area by a convoy of 7-ton trucks and 12-ton trucks. A couple of 4-WD trucks (2 to 5 tons in capacity) and a bulldozer were chartered for the transportation of drilling machine and equipment from the main road to the drilling sites through a series of roads which was constructed for this drilling purpose for about 4 km in total. The transportation from the Da Mai area to the Ngan Me area was carried out by a series of trucks and bulldozer.

Supply for the camp was made a couple of times in a week. Fuel and foods were bought at Thai Nguyen, and were transported by chartered cars.

Drilling Water

Water for drilling was pumped up from the middle reaches of creeks to the drilling sites via pipelines whose length was about 2 km for each area. The difference of altitudes between pumping station to the drilling sites was nearly 200 m. Mud water was also prepared in that pumping station, and sent through the pipeline to the drilling sites.

Withdrawal

After the completion of drilling program, the machine and equipment were withdrawn by trucks through the route to Hanoi via Thai Nguyen. The drill holes were capped, and drilling sites were cleaned and reclaimed. The drilling cores, of which some part was taken for assay samples, were kept in the storage house in the office of the NE Geological Division of DGMV, Thai Nguyen.

(2) Progress of Drilling

The progress of each drill hole is described below. The summary of working time, records of drilling operation, records of drilling performance, and charts of drilling progress are shown in tables and figures in the third phase report.

MJVB-5: For the near-surface weathered zone (3.50 m), drilling was done by PQ size diamond bit (132 mm in diameter) with inserting of drive pipes (146 mm in inner diameter). Weakly weathered bedrock and the upper part of bedrock zone (down to 100 m deep) were drilled by the conventional drilling method using HQ size diamond bit (91 mm in diameter) for the maximum core recovery. The weakly weathered bedrock continued to 40 m deep. Reaming at 117 mm in diameter was done by using

diamond and metal bits, and HW casing pipes (108 mm in inner diameter) were inserted in this zone (40.00 m). For the upper part of bedrock zone, NW casing pipes (89 mm in inner diameter) were inserted down to 103.90 m.

From 103.90 m to 300 m (the end of hole), drilling was made with NQ size diamond bit (76 mm in diameter) and NQ-WL core tube.

Bentonite clay, polymer (CMC) and NaOH were usually mixed in the circulating drilling water. The circulating water was lost in the hole at 27.00 and 76.30 m where fractures were developed.

Drill hole survey was made using a Toropali survey instrument. The results of survey for inclination were: -45° at 0 m, -48° at 100 m, -41° at 200 m, and -37° at 300 m. The overall core recovery was 99.6 % in this hole.

MJVB-6: For the near-surface weathered zone (2.80 m), drilling was done by 152 mm metal shoe with inserting of drive pipes (146 mm in inner diameter). Weakly weathered bedrock and the upper part of bedrock zone (down to 99.70 m in depth) were drilled by the conventional drilling method using HQ size diamond bit (91 mm in diameter) for the maximum core recovery. The weakly weathered bedrock continued to nearly 90 m deep. A silicified and clayey zone with some fractures was caught at around 33 m. Moreover, the drill hole met three old workings at depths of 22.60 – 23.00, 41.00 – 42.55 and 54.35 – 55.00 m. Drilling water was totally lost in these depths. Reaming at 152 mm in diameter was done by using diamond and metal bits firstly, and 146 mm casing pipes were extended to 28.00 m. Reaming at 136 mm in diameter was done next, and 127 mm casing pipes were inserted to 46.50 m. Reaming at 117 mm in diameter was done lastly, and 108 mm casing pipes were inserted to 86.30 m.

From 99.70 m to 300 m (the end of hole), drilling was made with NQ size diamond bit (76 mm in diameter) and NQ-WL core tube. For the upper part of bedrock zone, NW casing pipes (89 mm in inner diameter) were inserted down to 140.20 m with reaming at 94 mm.

Bentonite clay, polymer (CMC) and NaOH were usually mixed in the circulating drilling water. In the deeper part where water escaped along significant fractures, GPC was added with normal bentonite-polymer mud to stop the water loss in this hole.

Drill hole survey was made using a Toropali survey instrument. The results of survey for inclination were: -45° at 0 m, -52° at 100 m, -49° at 200 m, and -47° at 300 m. The core recovery was 99 % in this hole in total.

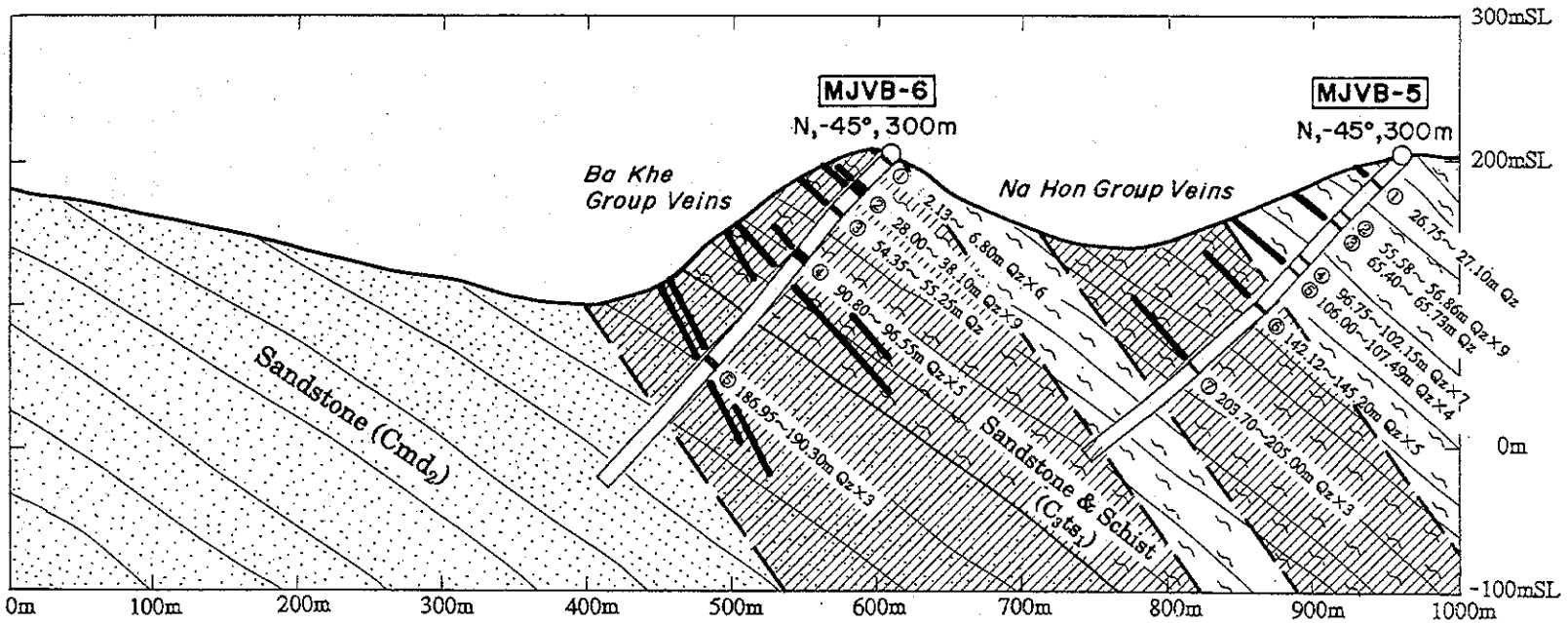
3-6-3 Geologic Description of Drill Holes

The geology of the area where drilling exploration was carried out in the third phase is composed of schist and sandstone of the Tan Sa (S_{3ts1}) and Mo Dong Formations (C_{md2}).

Weathered schist and sandstone occur below the surface soil (a few to 30 cm thick), and extends to 2 to 4 m deep along the drill hole (every hole has drilled at an angle of –45 degrees). Bedrock appears below about 40 m in depth. Drill hole sections are shown in Fig. 2-3-7.

MJVB-5: The geology around the drill hole MJVB-5 is composed of schist and sandstone of the Tan Sa Formation. It is located at the upper reaches of Na Hon creek. The altitude of the drill hole is about 200 m above sea level. The purpose of this hole was to investigate the lower extension of gold mineralization in the southern part of the Ba Khe prospect. It mainly targeted at the Na Hon Group veins in the Ba Khe prospect. The geology of the drill hole is divided into two series: an alternating bed of sandstone and schist (upper part), and sandstone with intercalation of schist layers (lower part). The details of geology of the drill hole are described in the third phase report.

MJVB-6: The geology around the drill hole MJVB-6 is composed of schist and sandstone of the Tan Sa and Mo Dong Formations. It is located at the upper reaches of Ba Khe creek. The altitude of the drill hole is about 200 m above sea level. The purpose of this hole was to investigate the lower extension of gold mineralization in the central part of the Ba Khe prospect. It mainly targeted at the Ba Khe Group veins in the Ba Khe prospect. The geology of the drill hole is composed of two series: an alternating bed of sandstone and schist (upper part, Tan Sa Formation), and sandstone with intercalation of schist layers (lower part, Mo Dong Formation). The details of geology of the drill hole are described in the third phase report.



MJVB-6

Ser No.	Sample No.	Depth (m) From	Depth (m) To	Sample Width (cm)	Au (g/t)	Ag (g/t)	Cu (%)	Pb (%)	Zn (%)	Fe (%)
1	618	2.13	2.50	37	0.023	1.1	0.002	0.008	0.003	3.60
2	601	2.80	3.10	30	0.034	1.3	0.004	0.016	0.006	6.47
3	602	4.00	4.50	50	0.011	0.7	0.002	0.021	0.002	1.80
4	603Y	4.60	4.75	15	0.012	1.4	0.003	0.012	0.009	4.93
5	604	6.60	6.80	20	0.010	1.0	0.003	0.006	0.002	3.43
6	605Y	20.50	20.70	20	0.010	0.6	0.002	0.003	0.001	2.79
7	606	28.00	29.00	100	0.019	1.2	0.007	0.011	0.001	2.22
8	607	29.00	30.00	100	0.015	0.7	0.002	0.016	0.001	2.08
9	608	30.00	31.00	100	0.012	0.7	0.002	0.013	0.001	1.66
10	609	31.00	32.00	100	0.020	0.8	0.003	0.012	0.001	1.60
11	610	32.00	33.00	100	0.028	<0.5	0.003	0.007	0.001	2.53
12	611	33.00	34.00	100	0.044	1.0	0.003	0.011	0.001	1.41
13	612	34.00	35.00	100	0.039	0.7	0.011	0.015	0.001	2.67
14	613	35.00	36.35	135	0.025	1.0	0.004	0.007	0.001	1.91
15	614	36.35	36.55	20	0.014	1.1	0.005	0.009	0.001	3.60
16	615Y	36.55	37.50	95	0.015	0.5	0.003	0.006	0.002	3.15
17	616	37.50	38.10	60	0.040	0.9	0.005	0.009	0.004	3.32
18	617	54.35	55.25	90	0.081	0.8	0.004	0.003	0.005	4.59
19	619Y	68.05	68.15	10	0.107	1.3	0.001	0.001	<0.001	0.79
20	620Y	90.80	90.95	15	0.046	0.5	0.006	0.005	0.012	10.39
21	621	96.40	96.55	15	0.012	0.9	0.003	0.003	0.005	4.17
22	622	108.15	108.40	25	0.031	0.7	0.005	0.006	0.008	13.43
23	624	168.63	168.80	17	0.015	<0.5	0.003	0.003	0.006	3.94
24	625	173.05	173.40	35	0.018	<0.5	0.003	0.004	0.005	4.45
25	626	186.95	187.70	75	0.013	<0.5	0.002	0.003	0.005	4.19
26	627	188.20	188.73	53	0.023	0.5	0.005	0.003	0.006	4.05
27	628	190.10	190.30	20	0.205	<0.5	0.002	0.003	0.004	3.26
28	629	258.75	259.20	45	0.011	<0.5	0.001	0.001	0.003	2.81
29	630	279.72	280.30	58	0.012	0.7	0.003	0.005	0.009	5.63

MJVB-5

Ser No.	Sample No.	Depth (m) From	Depth (m) To	Sample Width (cm)	Au (g/t)	Ag (g/t)	Cu (%)	Pb (%)	Zn (%)	Fe (%)
1	501	26.75	27.10	35	0.019	<0.5	0.002	<0.001	<0.001	1.01
2	502	55.58	55.68	10	0.013	<0.5	0.002	0.001	0.007	4.05
3	503	56.62	56.74	12	0.019	<0.5	0.003	0.001	0.005	7.01
4	504	65.40	65.73	33	<0.001	<0.5	0.001	0.001	<0.001	1.21
5	506	101.10	101.25	15	0.059	<0.5	0.014	<0.001	0.002	3.21
6	507	101.95	102.15	20	0.026	0.6	0.001	0.001	0.001	1.41
7	508	106.00	106.15	15	0.049	<0.5	0.003	0.002	0.003	4.56
8	509	110.43	110.75	32	0.010	<0.5	0.002	0.002	0.002	3.85
9	510	120.10	120.25	15	0.020	<0.5	0.002	0.004	0.003	7.01
10	511	142.12	142.58	46	0.041	<0.5	0.004	0.002	0.004	3.15
11	512	143.45	143.74	29	0.023	1.1	0.008	0.016	0.007	4.90
12	513	144.10	144.50	40	0.037	0.8	0.006	0.003	0.007	4.08
13	514	145.00	145.20	20	0.015	<0.5	0.003	0.002	0.003	3.66
14	516	170.50	170.80	30	0.091	0.6	0.002	0.002	0.002	5.80
15	523	194.67	194.93	26	0.013	1.1	0.005	0.005	0.007	5.54
16	517	194.97	195.12	15	0.024	<0.5	0.006	0.005	0.010	4.36
17	518	203.70	203.95	25	0.016	0.5	0.005	0.003	0.007	4.62
18	519	204.18	204.40	22	0.011	<0.5	0.005	0.004	0.008	4.73
19	520	204.70	205.00	30	0.013	0.5	0.004	0.005	0.008	4.36
20	521	263.25	263.61	36	0.020	<0.5	0.001	<0.001	0.004	3.49

Fig. 2-3-7 Geologic Section along the Drill Holes (MJVB-5 and MJVB-6)

3-6-4 Mineralization

Two holes totaling 600.00 m were drilled in the central to the western part of the Ba Khe prospect in the third phase. As was described in the previous section, a significant amount of quartz veins were intersected in these drill holes. They were classified into several groups of veins in each hole on the basis of the vein nature (similarity of ore, gangue and alteration mineralogy, morphological and spatial closeness). No significant gold assay has been returned in these drill holes.

MJVB-5: This drill hole is located at the upper reaches of Na Hon creek in the Ba Khe prospect. The main purpose of this hole was to investigate the lower extension of the Na Hon Group veins of the Ba Khe prospect. Seven major groups of veins were caught in this hole in total. The outline of the mineralization and hydrothermal alteration is summarized as follows.

(1) 26.75 – 27.10 m: Light gray quartz vein with a small amount of limonite. Several gold grains of medium to fine carat were found in slime of drilling.
(2) 55.58 – 56.86 m: Quartz veinlet zone, consisting of 9 white/light gray quartz veinlets (1 to 4 cm each). Limonite is partly disseminated. Several gold grains of medium to fine carat were found in slime of drilling.
(3) 65.40 – 65.73 m: White quartz vein. Limonite is disseminated. A small amount of chalcopyrite, covelline and pyrrhotite were observed under the microscope.
(4) 96.75 – 102.15 m: Quartz vein/veinlet zone, consisting of 7 light gray quartz veins/veinlets (2 to 20 cm wide each) with occasional pyrite dissemination.
(5) 106.00 – 107.49 m: Quartz veinlet/breccia zone, consisting of 4 light gray quartz veinlets/breccias (1 to 15 cm wide each). Pyrite is disseminated strongly in some part.
(6) 142.12 – 145.20 m: Quartz vein/veinlet zone, consisting of several white/light gray quartz veins/veinlets (7 to 46 cm wide each). Pyrite is disseminated. A small amount of chalcopyrite was observed under the microscope. Partly clayey. Chloritization and silicification were observed.
(7) 203.70 – 205.00 m: Quartz vein/network zone, consisting of 3 white/light gray quartz-calcite (-ankerite) veins/networks (15 to 30 cm wide each). Pyrite is disseminated partly. A small amount of chalcopyrite, sphalerite, galena and pyrrhotite were observed under the microscope.

MJVB-6: This drill hole is located at the upper reaches of Ba Khe creek in the Ba Khe prospect. The main purpose of this hole was to investigate the lower extension of the Ba Khe Group veins of the Ba Khe prospect. Five major groups of veins were caught in this hole in total. No significant assay result of Au was obtained in this drill hole. Three old workings were caught in shallow parts of this hole. The outline of the mineralization and hydrothermal alteration is summarized as follows.

(1) 2.13 – 6.80 m: Quartz vein/silicified zone, consisting of 6 light gray broken quartz veins/silicified zones within weathered schist (saprolite). Limonite is disseminated in quartz. Several gold grains of coarse to fine carat were found from slime of drilling.

(2) 28.00 – 38.10 m: Light gray/brown clayey zone, containing quartz veins/veinlets in the weathered schist. Most significant quartz vein occurs at 36.35 – 36.55 m. Several gold grains (coarse to fine carat) were found in slime of drilling.

(3) 54.35 – 55.25 m: Light gray quartz veins and old adit. Broken quartz of 25 cm in length was returned as cores.

(4) 90.80 – 96.55 m: Quartz vein/veinlet zone, consisting of 5 light gray quartz veins/veinlets (1 to 15 cm wide each). A small amount of pyrite is disseminated. A small amount of chalcopyrite was observed under the microscope.

(5) 186.95 – 190.30 m: Quartz veinlet/network zone, consisting of 3 white quartz veinlets/networks (a few to 53 cm wide each). Pyrite is significantly disseminated in some part. Galena and chalcopyrite were observed partly by naked eye. A small amount of pyrrhotite was observed under the microscope.

3-6-5 Fluid Inclusion Studies

(1) Methodology

Quartz chips of the drill cores were collected, and provided for fluid inclusion studies. More than ten quartz chips were sampled from drill cores althgether in Da Mai and Ngan Me in the third phase. All samples were taken from quartz veins. The same methods and measurements as in the detailed geological survey were made for the studies.

(2) Results of Studies

The results of fluid inclusion studies were already explained in the chapter of the Da Mai area.

3-7 Discussion

3-7-1 Geology, Geologic Structure and Mineralization

General geological features in the Da Mai, Ngan Me and Gang areas were already discussed altogether in the section of the Da Mai area.

3-7-2 Geochemistry

General geochemical features in the Da Mai, Ngan Me and Gang areas were already discussed altogether in the section of the Da Mai area.

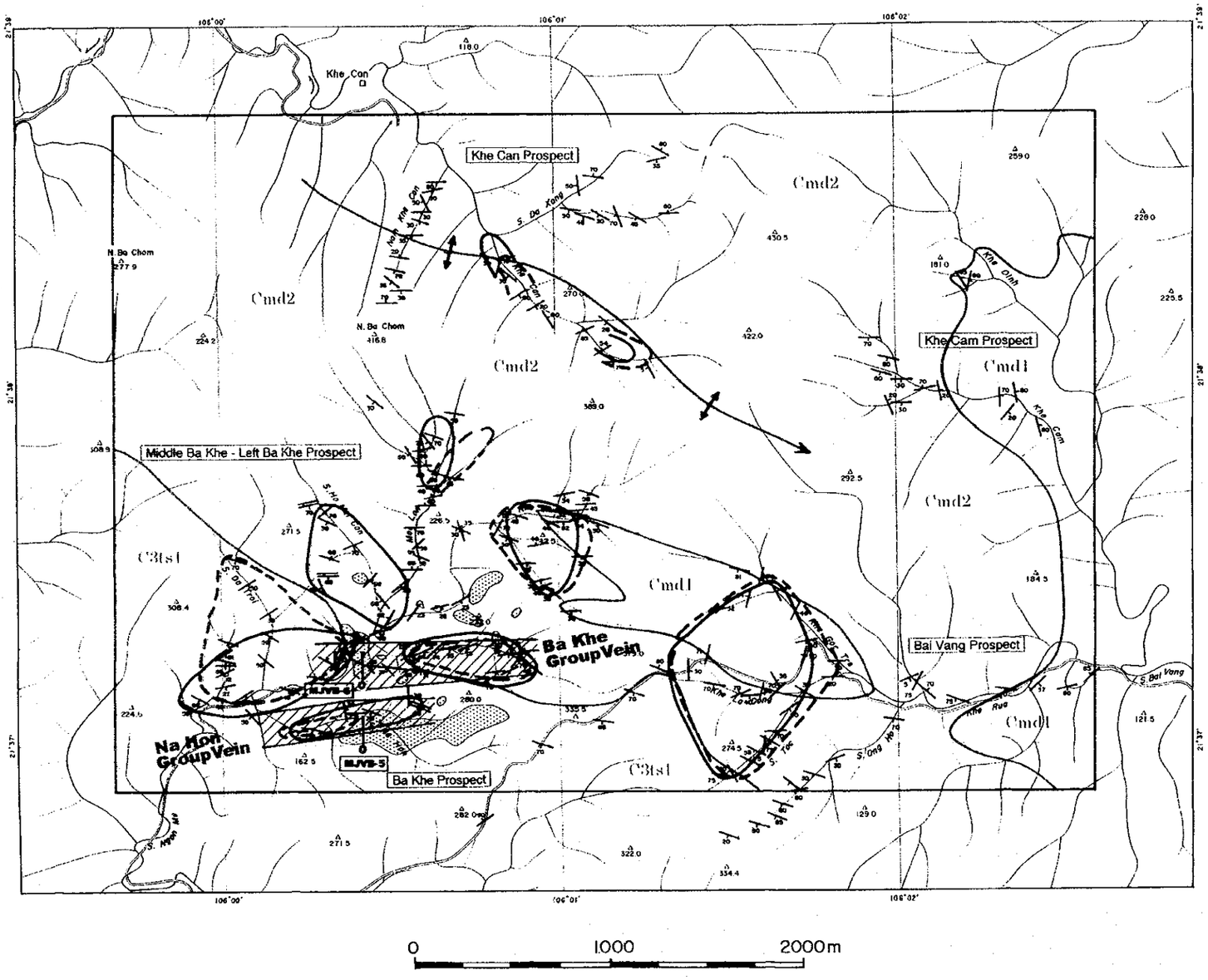
3-7-3 Geophysics

General geophysical features in the Da Mai, Ngan Me and Gang areas were already discussed altogether in the section of the Da Mai area.

3-7-4 Potential of Mineral Resources

In the Ba Khe prospect, two holes totaling 600 m were drilled in the third phase. The results were disappointing; no significant intersection of gold-bearing quartz veins was caught in these drill holes, although the development of quartz veins was significant. Gold-bearing quartz veins in this area were lack of continuation and small scale. They dispersedly occur, without any concentration of significant scale. Some of them occasionally show very high grade in Au. Such grades, however, are not stable. The dimension of gold resources was considered to be something from several hundreds to several thousand tons of ores; that is unfortunately far smaller than what is required in our exploration.

The integrated interpretation of the survey results in the Ngan Me area is shown in Fig. 2-3-8.



LEGEND

Cambrian
- C3ts1 — Lower Than Sa Formation
- Cmd2 — Mo Dong Formation
  2. Mainly composed of sandstone
- Cmd1 — 1. Alternation ofschist & sandstone

Fault

Anticlinal Axis

Gold-bearing Quartz Vein

Group of Vein

Major Geochemical Anomaly (Au)

Major Geochemical Anomaly (Basemetal)

Strong IP Anomaly (> 30mv/v)

Drill Hole (Phase III)

Fig. 2-3-8 Integrated Interpretation of the Survey Results in the Ngan Me Area

Chapter 4 Gang Area

4-1 Introduction

Gold-bearing quartz veins occur in the Gang area. The semi-detailed survey comprising geological survey and geophysical survey (CSAMT method) was carried out in the Gang area in the first phase. The gold potential in the Gang area was estimated to be not large, counted to be next to those of the Da Mai and Ngan Me areas.

4-2 Geological Survey

4-2-1 Outline of Survey

The semi-detailed survey consisting of geological survey, geochemical survey (stream sediment and panning surveys, as parts of the regional geochemical works mentioned in the above section) and geophysical survey (CSAMT method) was carried out in the Gang area in the first phase as a part of the survey in three areas (Da Mai, Ngan Me and Gang areas). The purpose was to survey mineral showings in the area, to catch geochemical anomalies and to define target mineralization for the next phase exploration. Geophysical survey using the CSAMT method was carried out in the semi-detailed survey area for the purpose of investigating the relationship between resistivity and geologic structure. The survey area was amounted to 16 km^2 in total three areas. The regional geologic map of 1:50,000 scale was generated as a result of this survey.

Based on the results of the first phase survey, which were composed of regional geological survey, stream sediment geochemical survey, panning survey, semi-detailed geological survey and geophysical survey (CSAMT method), two areas – Da Mai and Ngan Me areas – were selected for the potential gold prospects in the second phase detailed survey. The potential of the Gang area was considered to be next to those of the Da Mai and Ngan Me areas.

4-2-2 Semi-Detailed Geological Survey (Phase I)

(1) Survey Method

The gold-bearing quartz veins in the Gang area were preliminary surveyed in the first phase following to the regional geological survey. The occurrence of veins was investigated with some representative sketches of 1:50 to 1:100 scale and samples for assaying and laboratory works. The

number of samples collected in the survey was already mentioned in the section of the Da Mai area. The results of these studies are shown in tables in the first phase report. The summary of the Schumidt's stereo net projections of quartz veins is explained in the section of the detailed geological survey. The results of the fluid inclusion studies are explained in a section below.

(2) Geology and Mineralization

The Gang area, which lies along the middle reaches of S. Hoan, had been known to local people as an alluvial gold mining place in the past. The first quartz vein containing gold has been discovered by a local prospector at the Khe Gang creek in 1987, and hard rock mining started. Since then, numerous quartz veins have been found and tens of shafts and adits were dug over the area.

Gold-bearing quartz veins in the Gang area are hosted by sandstone, shale, sericite schist and black slate of the Mo Dong and Than Sa Formations. The width of veins ranges from about 10 cm to 1 m. The major trend of vein systems is E-W to WNW-ESE. Most of the veins dip gently to S. Veins of N-S and NE systems locally occur. The average strike and dip of quartz veins is N87°E, 28°S by the stereo net analysis. This vein structure is concordant to the general trend of the bedding of the host sediments in the Gang area. However, some veins crosscut the host bedding at a narrow angle. Gold is generally accompanied by some sulfide minerals. Pyrite and arsenopyrite are the two major sulfide minerals. Other sulfide minerals found under the microscope are: chalcopyrite, covelline, and pyrrhotite. The host rocks beside the vein are slightly altered. Silicification and sericitization are the major wall-rock alteration. Chloritization and kaolinization were locally observed.

The major prospects in the Gang area are: Khe Gang (a branch of S. Hoan), Khe Hoac (another branch south of Khe Gang), and Cay Thi (the next branch south of Khe Hoac). The G-1 vein which was discovered by the Division in 1992 is located about 1 km northwest of the Khe Gang prospect. This vein has the trend of N-S to NNW-SSE strike with the dip of 60°W. Assay results up to 29.77 g/t Au at 50 cm in width were obtained. Another vein called G-2 was known approximately 500 m upstream of the Khe Gang creek from the Khe Gang prospect. The G-2 vein shows E-W system dipping 20°-35°S. The geology and geologic profile of the Gang area are shown in figures in the first phase report. The distribution of gold-bearing quartz veins is shown in Fig. 2-4-1.

The details of the occurrences of quartz veins in the major prospects are described as follows.

Khe Gang: More than 20 shafts (vertical and inclined) were dug over an area of 800 m long by 100 to 200 m wide stretching E-W along the southern side of the Khe Gang creek. The host rocks are sandstone and schist of the Mo Dong Formation. The veins generally strike E-W and dip gently to S (at 20° to 40°). The widths of veins are up to 1 m. One of quartz samples collected in the Khe Gang prospect contains a significant amount of sulfide minerals. A mineral assemblage comprising pyrite,