CHAPTER 2 COMPREHENSIVE ANALYSIS

2-1 Characteristics of geologic structure and mineralization

A surface geological map and geological plans at the 1930 m and the 1850 m levels are displayed in Figs I-2-1, I-2-2 and I-2-3, respectively, whilst Figs. I-2-2 (1) thru (4) show geological cross sections. An integrated interpretation map is displayed in Fig. I-2-5.

2-1-1 Geologic structure and mineralization

(1) Geologic structure

- In the vicinity of the No.3 Ore Body, the boundary between the Altyn-Jylga intrusive rock body and limestone strikes SW and dips eastward (Figs. I-2-1 ~ 3). The inclination of the boundary is about 70° from the surface up to the 1780 m level while 50° to 55° at deeper levels (Figs. I-2-4(1) and (2)). In Southern Deposit, inclination of the boundary between the intrusion and limestone is as steep as about 80° on the surface (Fig. I-2-4 (4)).
- Dominant in limestone are lamprophyre and granodiorite porphyry dikes of the two crossing directions: one striking NE-SW and dipping south while the other striking NW-SE and dipping south, as well as faults and shear joints in the same directions (Figs. I-2-1 ~ 3).
- The skarn continues in belt, approximately 10 m wide, expanding and contracting on the boundary between the Altyn-Jylga intrusive rock body and limestone, to form the skarn zone (Figs. I-2-2 and -3).

(2) Mineralization

- At the No.3 and No.5 Ore Bodies and Southern Deposit, mineralization chiefly of gold and copper are observed mainly in the skarn zone and partly in dikes(the mineralized dikes). Mineralization spreads extensively in the skarn zone while, in the dikes, it is partially recognizable accompanying skarnization on boundaries with wall rocks and along joint walls.
- Gold mineralization is observable at the No.3 Ore Body, controlled by the skarn zone extending NNE-SSW and fractures (dikes and faults) striking NW-SE which intersect the skarn zone. At the intersections, these form bonanzas, as seen in the north and south parts of the 1850 m level tunnel and also at north, central and south parts of the 1930 m level tunnel (Fig. I-2-5).
- Gold-copper mineralization is observable almost all over in the 1930 m level tunnel (including the existing tunnel). Gold grades of the ores ascertained are 23.4 g/t in north, 58.0 g/t in central part and 116.2 g/t in south, in terms of

the maximum grade of 1 m in width, tending to increase towards the south.

- The ore minerals are pyrite, arsenopyrite, magnetite, chalcopyrite, bornite and electrum. The skarn minerals are clinopyroxene (hedenbergite), garnet (chiefly andradite), amphibole (ferroactinolite), wollastonite, etc.
- The gold mineral is electrum, paragenetic with chalcopyrite and bornite, included by these or filling their cleavages. Homogenization temperature of fluid inclusion of quartz and calcite associated with electrum has several peaks of frequency distribution at 260°C, 160°C, etc.

(3) Occurrence of ore bodies and ores

- The No.3 Ore Body almost conforms to the plate-like shape of the skarn zone. The bonanzas in the ore body is shaped like vertically elongated lenses (Fig. I-2-5).
- Ore minerals assemble ununiformly in the skarn and dikes, disseminated or in patches or thin veins, forming ore shaped like irregular masses, lenses, etc.
- Ores in bonanzas are in the shapes of irregular masses, lenses, dissemination and veins. Ores shaped like irregular masses tend to occur in the boundary between the skarn zone and marbles on the hanging side, those of lenticular shapes and disseminated ones tend to be found in pyroxene-garnet skarn (exoskarn), whilst those of vein forms tend to occur along parallel or lattice-like cracks in endoskarn or along irregular cracks in marble.
- The main ore mineral of high grade ore (Au>50 g/t) is chalcopyrite formed in pyroxene-garnet skarn; e.g., samples Nos. 4071A, 4100, etc. Under microscope, chalcopyrite occurs as interstice-fillings among skarn silicates, often accompanied by electrum.
- Electrum accompanies chalcopyrite and bornite in many instances while, rarely, it is independently present in skarn minerals, or accompanies arsenopyrite or quartz. Electrum is in irregular or granular shapes, 1 μm ~ 200 μm in size, and is included in paragenetic minerals or forms middlings.

(4) Ores ascertained

- Major ores ascertained by the Phase III survey are listed below:

Locality (No.3 Ore Body)	Level (drill)	Width (m)	Au (g/t)
1) Lower extension	1725 m(MJKA-14)	7.0	3.8
2) - ditto -	1775 m(MJKA-15)	10.7	5.4
3) - ditto -	1705 m(MJKA-16)	4.0	3.4
4) - ditto -	1790 m(MKJA-17)	2.6	7.9
5) Northen extension	1850 m(MJKA18)	2.4	3.6
6) Hanging wall of southern part	1930 m(side track tunnel)	6.5	21.1

LEGEND

Quaternary — Q — Talus deposit

Altyn-Jylga intrusive rocks

Permian-Carboniferous

- a: lamprophyre (299 ± 15Ma) b: granodiorite porphyry — Dikes
- Granodiorites (282 ± 14Ma)
- Gabbroid

} Altyn-Jylga intrusive rock body

Kulduntau, Kumbel, Kalaimaxhmud formations

Carboniferous-Devonian — M M — Carbonate rocks : marble, limestone, cherty limestone, slate

Skarn & Other Alteration

- Pyroxene skarn, Garnet skarn
- Silicified or skarnized intrusive rocks
- Garnet-pyroxene skarnized intrusive rocks
- Argillization

Others

- Fault
- Fault shear zone
- Fault breccia
- 40 — Measured dip
- 60 — Representative dip
- 33.4 / 10.0 — Au (g/t) / width (m)
- Drilhole
- I — I' — Location of section

Legend for Fig I-2-5 (Generalized result)

- Fissure
- a, b — Bonanza (Au>10g/t, width>3m)
  a: preferable site for formation of bonanza
  b: proved body of bonanza
- a, b, c — Ore body (Au>1g/t)
  red: 1930m level blue: 1850m level
  a: new acquisition
  b: existing acquisition
  c: inferred body
- a, b — Skarn zone
  a: existing b: inferred
- Dike
- Fault
- (80) — Inferred dip

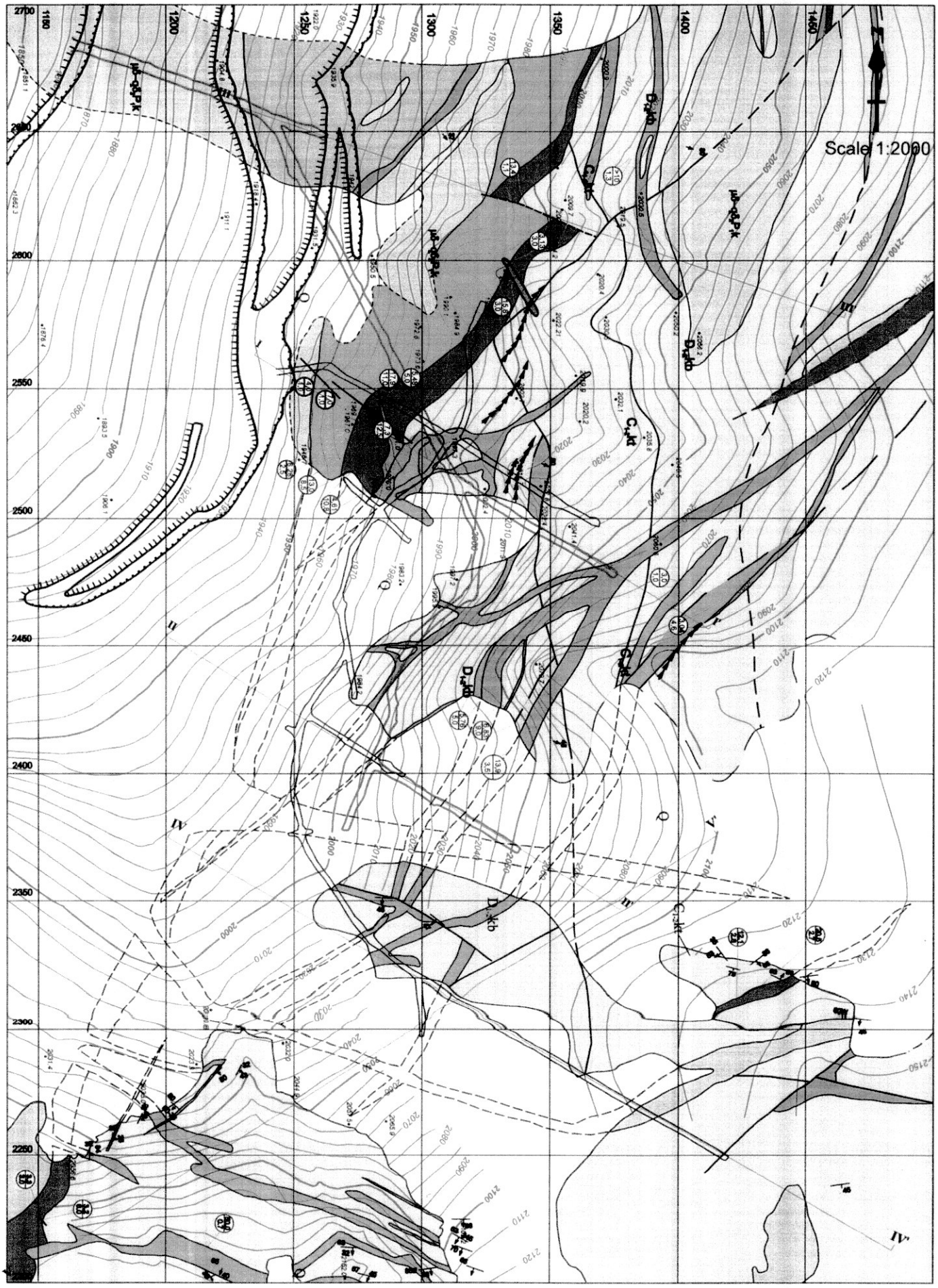

Fig.I-2-1 Geological Map of the Central District of the Altyn-Jylga Ore Field

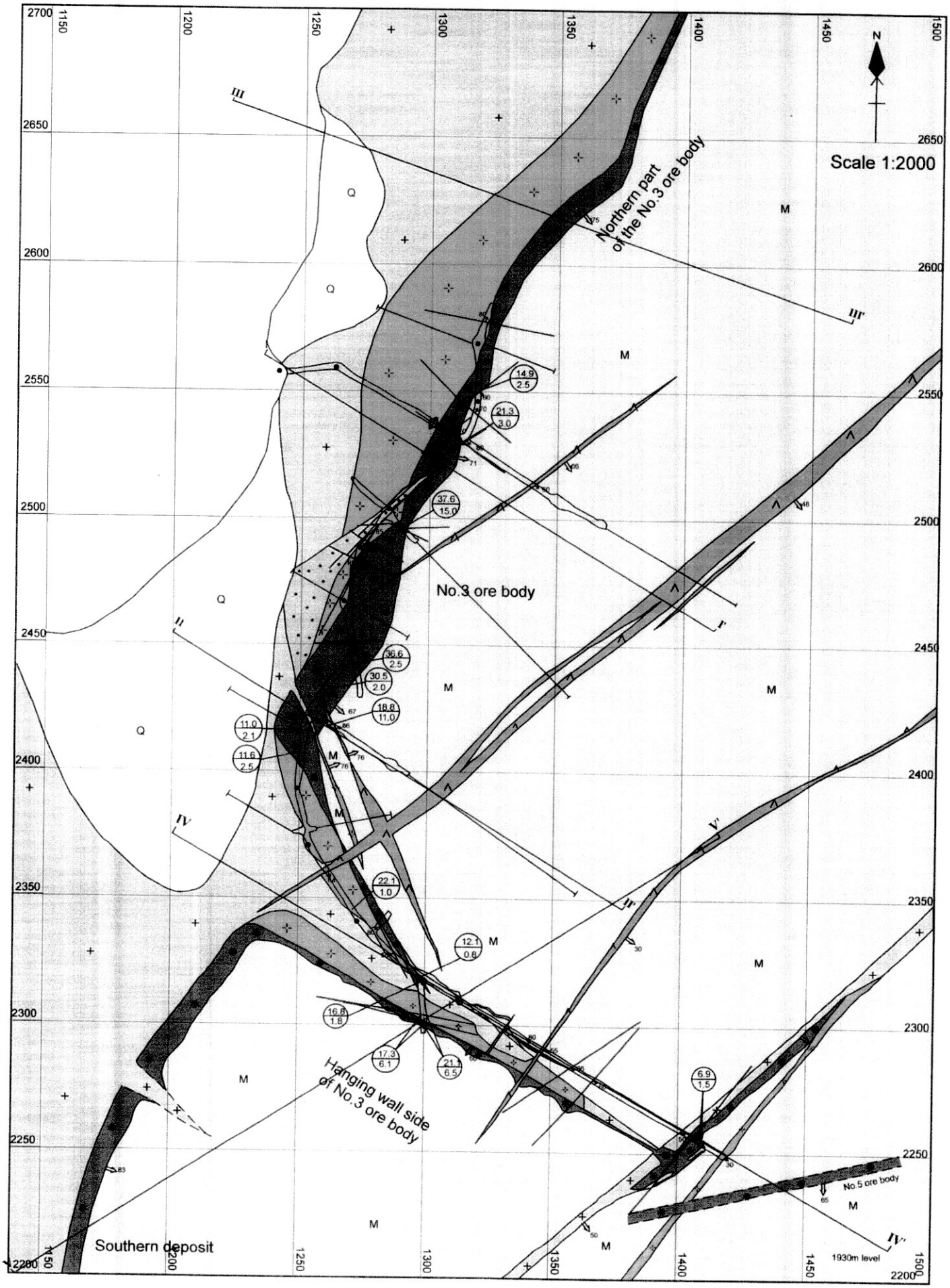

Fig.I-2-2 Geological Plan at the 1930 m Level of the Central District

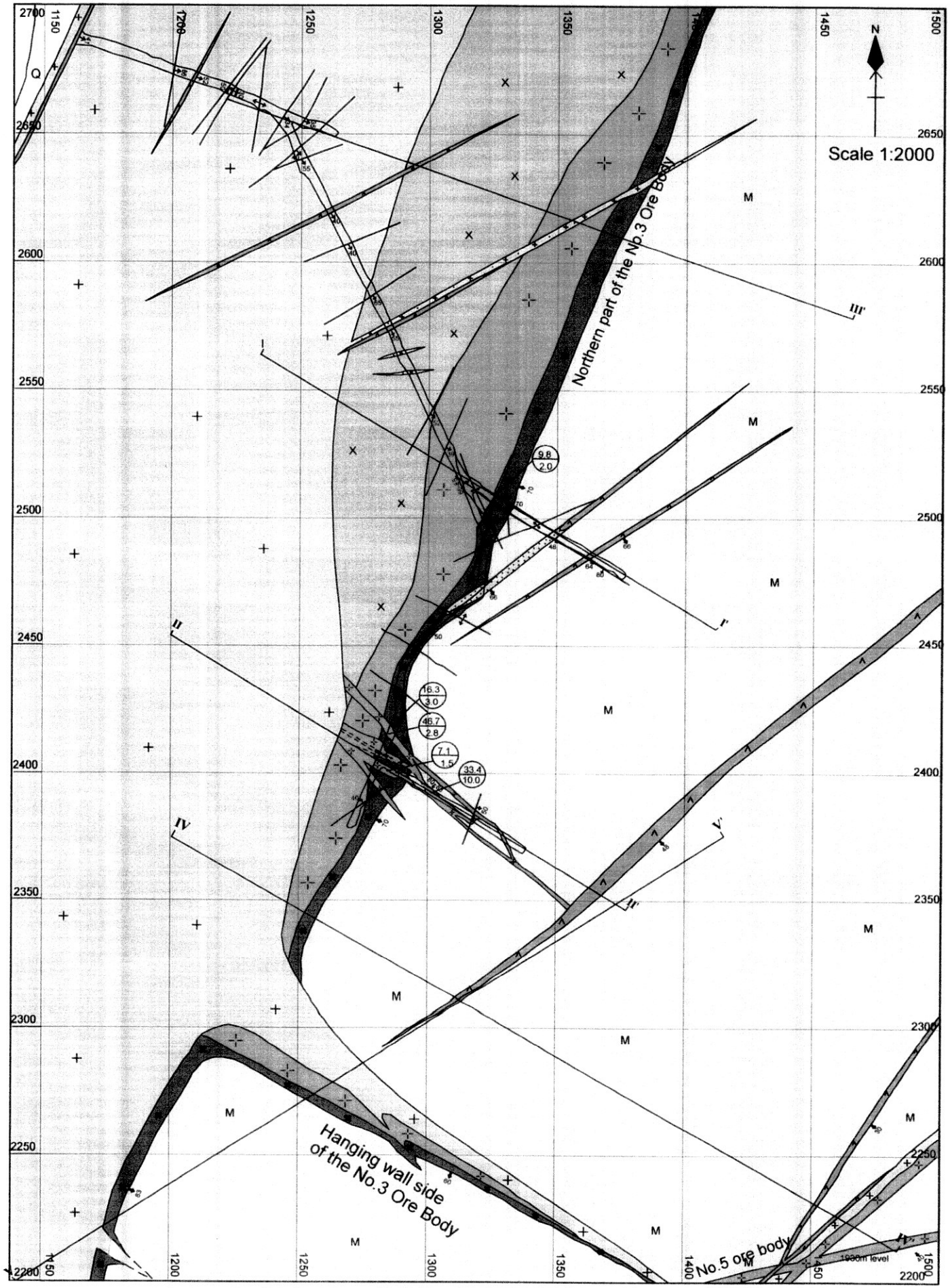

Fig. I-2-3 Geological Plan at the 1850 m Level of the Central District