

Fig. 2-2-30 (1) Geochemical Anomaly Map in the West Queen Elizabeth Area (Au)

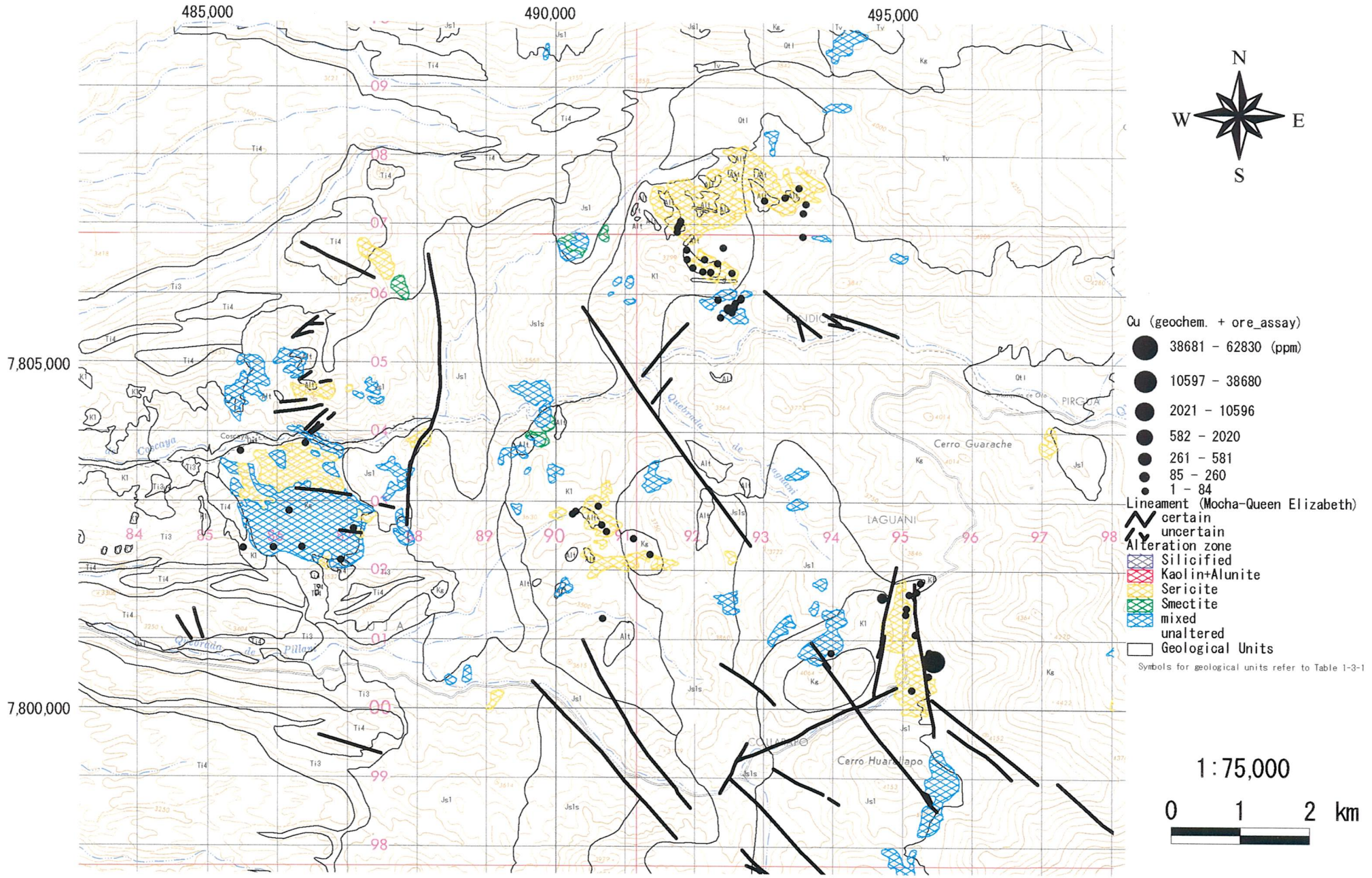


Fig. 2-2-30 (2) Geochemical Anomaly Map in the West Queen Elizabeth Area (Cu)

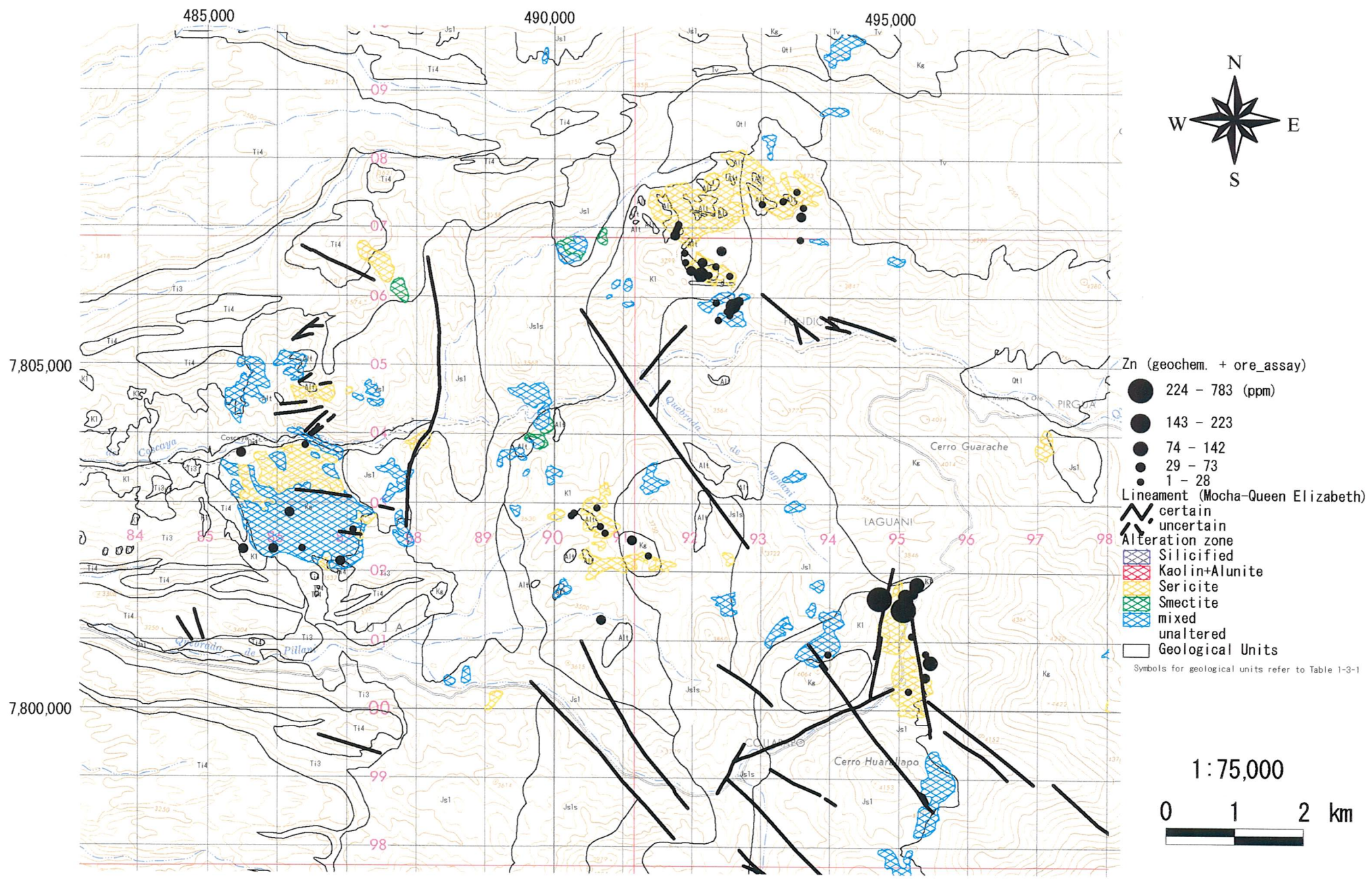


Fig. 2-2-30 (3) Geochemical Anomaly Map in the West Queen Elizabeth Area (Zn)

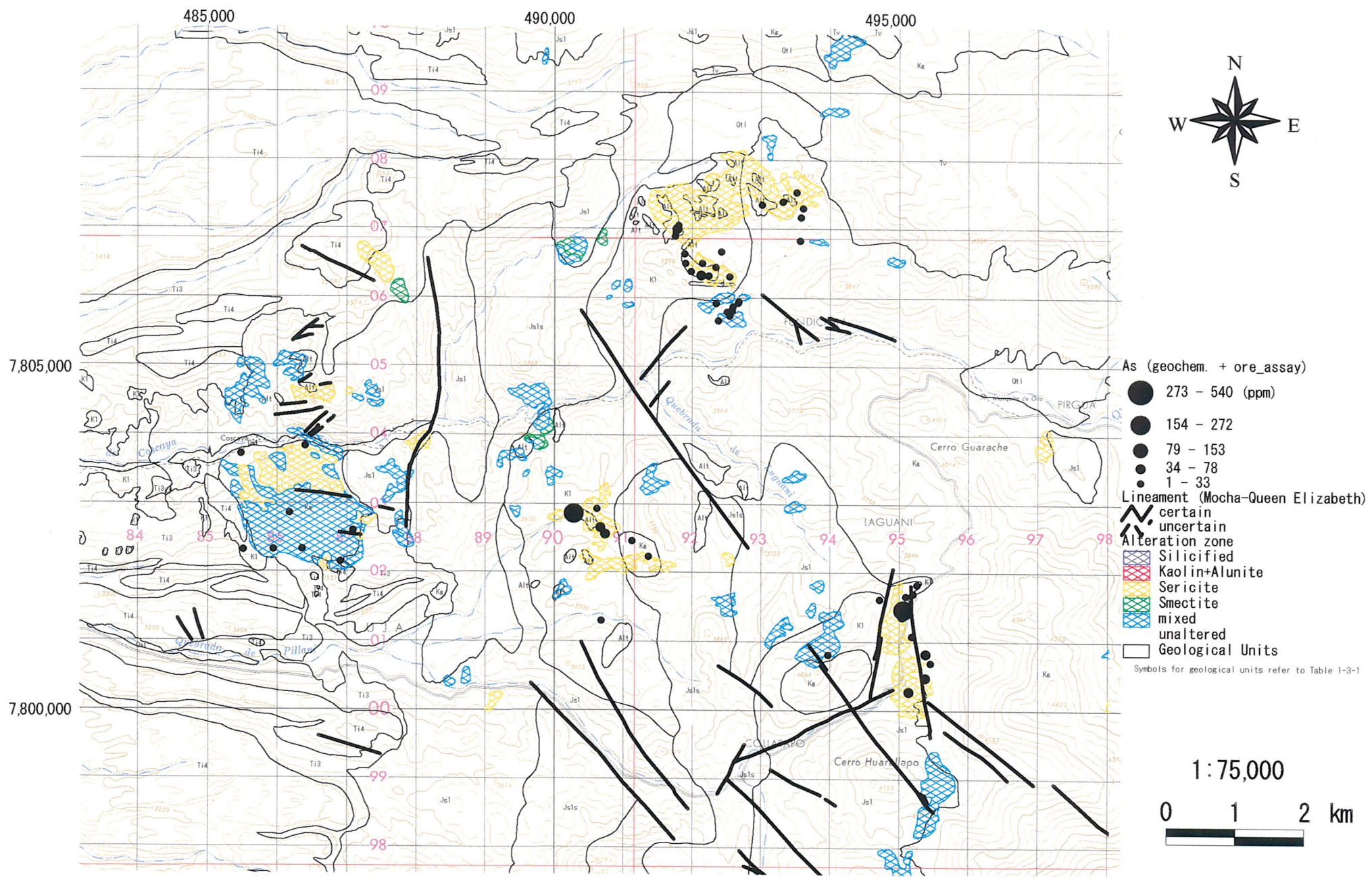


Fig. 2-2-30 (4) Geochemical Anomaly Map in the West Queen Elizabeth Area (As)

Alteration zones occur in four localities of this area, namely northern, central, southeastern, and western parts.

The northern alteration zone occurs in the Lower Cretaceous System and intrusive bodies (diorite, granite porphyry) and consists of silicification, sericitization, propylitization, and acidic alteration (kaolin, alunite, pyrophyllite). In this alteration zone, pyrite dissemination and limonitization are common, while quartz veins consisting partly of chalcedony are developed only locally. E-W trending andesite dikes occur in this zone.

The central alteration zone occurs in andesitic porphyry intruding Middle-Upper Jurassic System and in Lower Cretaceous System and consists of silicification, sericitization, propylitization, and kaolin. Pyrite dissemination and limonitization and hematitization are common in this zone. Development of quartz veins is not good, but NW-SE trending silicified zone is developed in this zone. This trend of the silicified zone coincides with the dominant direction of lineaments of this area.

The southeastern alteration zone occurs along the western side of the granodiorite body intruding into the Middle-Upper Jurassic System. A N-S extending lineament occurs along the western border of the intrusion and also a parallel lineament exist to the west. This alteration zone occurs between these two lineaments. This zone consists mainly of silicification and sericitization, and limonitization is also common. To the north of this zone, a 1m wide irregular magnetite vein occur for about 100m in the Jurassic System. Also to the south of this zone, quartz veinlets occur sporadically and green oxidized copper minerals, chalcopyrite, and pyrite are associated in parts of the veinlets, and biotite alteration is also observed.

The distribution of the western alteration zone coincides with that of the granite porphyry and the zone consists of silicification and sericitization, but ore minerals have not been found.

Notable rock geochemistry anomaly is high Au-Cu-Zn-As anomaly of the southeastern alteration zone, but its occurrence is local.

2 - 7 Tignamar district

For this district, geological map are shown in Figure 2-2-31, schematic geological column in

Figure 2-2-32, location of mineral showings in Figure 2-2-33, distribution of alteration minerals in Figure 2-2-34, and rock geochemical anomaly distribution in Figure 2-2-35.

The geology of this district consists of Paleozoic Erathem, Upper Cretaceous-Lower Tertiary System, Upper Tertiary System, and Upper Tertiary-Quaternary System.

The Paleozoic Erathem is composed of metamorphic rocks of sedimentary and volcanic origin, and gneiss.

The Upper Cretaceous-Lower Tertiary System is composed of andesitic~rhyolitic lava · pyroclastic rocks and terrigenous deposits.

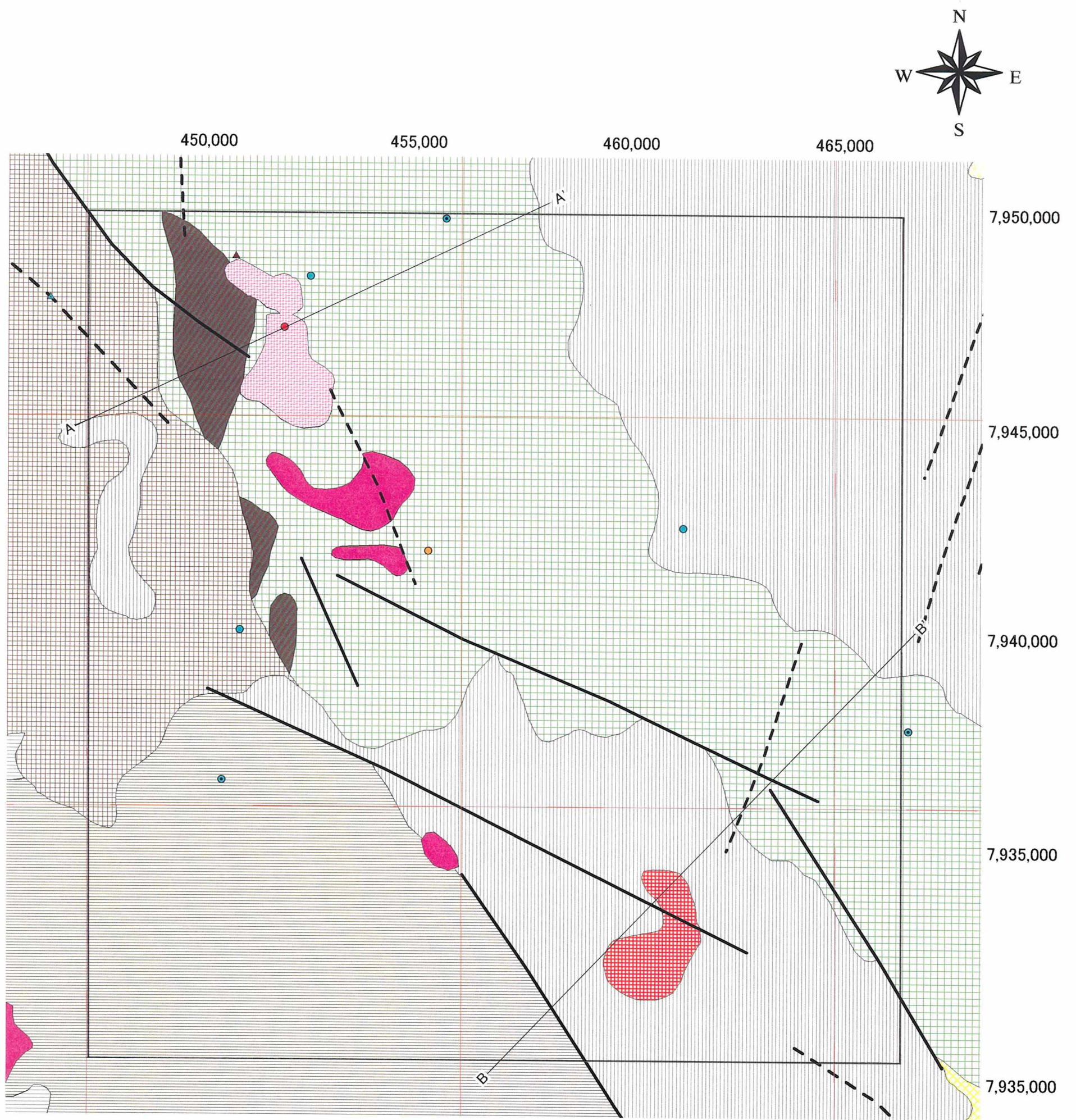
The Upper Cretaceous-Lower Tertiary System is intruded by Cretaceous to Tertiary igneous bodies. These intrusive rocks are granodiorite and porphyry. The Upper Cretaceous-Tertiary System and the intrusive bodies are overlain unconformably by Upper Tertiary System.

The Upper Tertiary System is composed of Miocene-Pliocene rhyolitic~basaltic lava · pyroclastic rocks · ignimbrite and intercalated terrigenous deposits.

The Upper Tertiary-Quaternary System is composed of Pliocene-Pleistocene andesitic~basaltic lava · pyroclastic rocks, and they are intruded by Neogene-Quaternary igneous bodies. These intrusive rocks are dacite~porphyry.

In this area, alteration zone occurs at two localities, one in the northern part and the other in the south.

The northern alteration zones are large and aligned in the NW-SE direction in the granodiorite · porphyry bodies and in the nearby Upper Cretaceous-Lower Tertiary System. The present survey was carried out for the zones on the northern side. This alteration zones consist of silicification, biotitization, sericitization, propylitization and kaolinization. Drilling and shafting have been carried out in parts of these zones. It has been reported that 12m-thick porphyry copper secondary enrichment zone was confirmed by a 30m-deep shaft dug in order to check the orebody encountered by drilling. Green oxidized copper minerals, coarse-grained pyrite accompanied by chalcopyrite, chalcocite-pyrite dissemination, and white coarse crystalline quartz veinlet fragments were found in the dump of this shaft. The vicinity of the shaft is oxidized leached zone consisting of quartz, kaolin, limonite, and



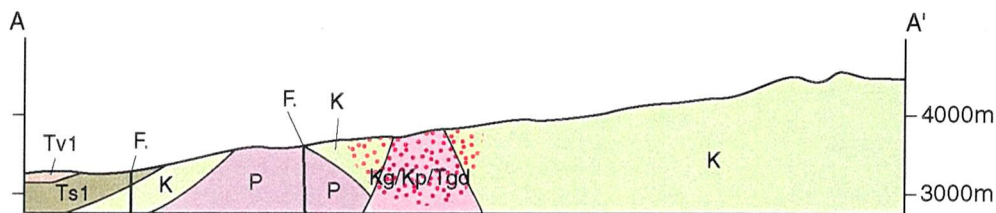
- | | |
|--|--|
| <p>Lineament</p> <ul style="list-style-type: none"> certain uncertain <p>Geological Map (mainly from TM image)</p> <ul style="list-style-type: none"> Lake alteration zone (A) Unconsolidated sediments (Qa) Unconsolidated sediments (Qa1) Unconsolidated talus deposits (Qd) Unconsolidated sediments (Qd1) Fine to medium-grained sediments (Ts3) Fine to medium-grained sediments (Ts2) Unconsolidated sediments, dacitic ignimbrite (TQ1) Unconsolidated talus deposits (Tvs2) Volcanic rocks (Tv3) Volcanic rocks (Tv2) Volcanic rocks (Tv1) Acidic volcanic rocks (Tvs) Fine-grained sediments (Ts1) Fine to medium-grained sediments (Ts) Volcanic rocks (K) Volcanic rocks (Kv) Medium-grained sedimentary rocks and volcanic rocks (Js2) Medium-grained sedimentary rocks and volcanic rocks (Js1) Volcanic rocks (Jv) Volcanic rocks and sedimentary rocks (P) <p>Intrusive Rocks</p> <ul style="list-style-type: none"> Igneous rocks (Ti) Igneous rocks (Kg/Kp/Tgd) Igneous rocks (Pg) | <p>Ore deposits and Prospects</p> <ul style="list-style-type: none"> Porphyry-Cu Porphyry-Cu,Mo Porphyry-Cu,Au Vein and Irregular-Cu Vein-Mo Vein-Au Vein-Ag,Pb,Zn Vein-Sb Vein and Irregular-Fe Vein and Irregular-Mn Stratiform-Cu Stratiform-Mn Unknown-Cu Unknown-Au Unknown-Ag,Pb,Zn Unknown-Fe Unknown-Mn |
|--|--|

Symbols for geological units refer to Table 1-3-1

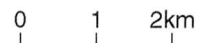
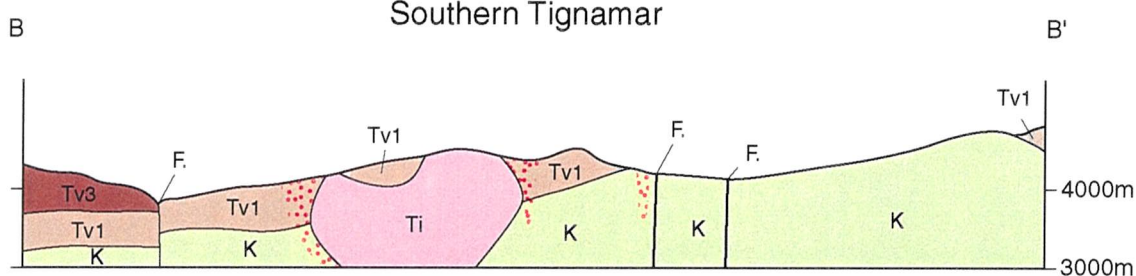
1: 100,000
0 1 2 km

Fig. 2-2-31 Geological Map of the Tignamar Area

Northern Tignamar



Southern Tignamar



| Geologic Time | | Columnar Section | Lithology | Intrusives | Mineralization |
|---------------|-------------------------------------|------------------|--|--|---------------------------|
| CENOZOIC | QUATERNARY | Tv3 | Andesitic~ basaltic lava/ volcaniclastics | Dacite, Porphyry(Ti) ↑ | Epithermal type ↑ |
| | LATE TERTIARY | Tv1 | Rhyolitic~ basaltic lava/ volcaniclastics, Intercalation of continental sediments | | |
| | LATE TERTIARY | Ts1 | | | |
| MESOZOIC | EARLY TERTIARY | | Andesitic~ rhyolitic lava/volcani- clastics Intercalation of continental sediments | Granodiorite, Porphyry(Kg/Kp/Tgd) ↑ | Porphyry copper type ↑ |
| | EARLY TERTIARY - LATE CRETACEOUS | Kg/Kp/Tgd+ | | | |
| PALEOZOIC | | | Gneiss, Metamorphosed sedimentary and volcanic rocks | | |

Fig. 2-2-32 Schematic Stratigraphic Columns and Profiles of the Tignamar Area

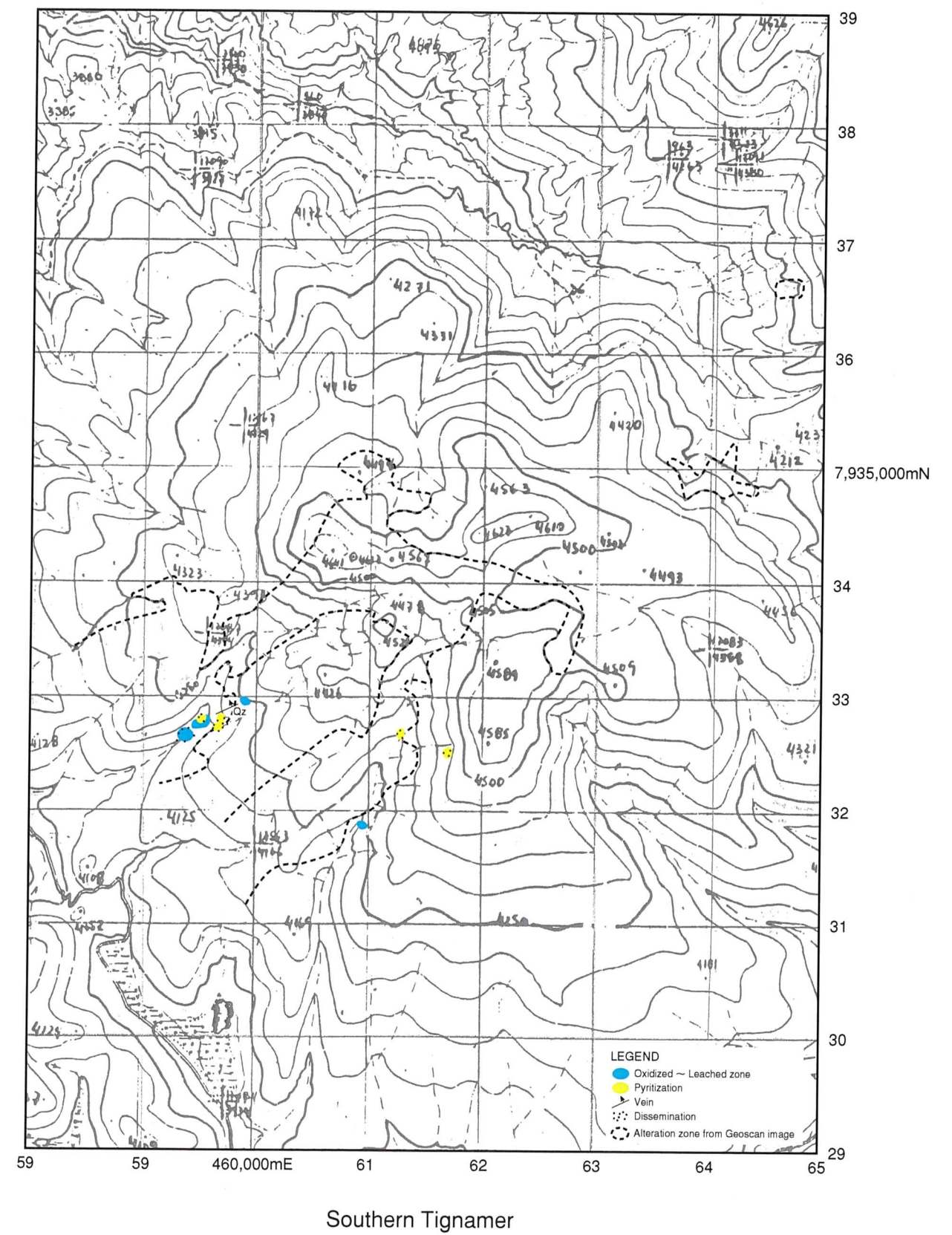
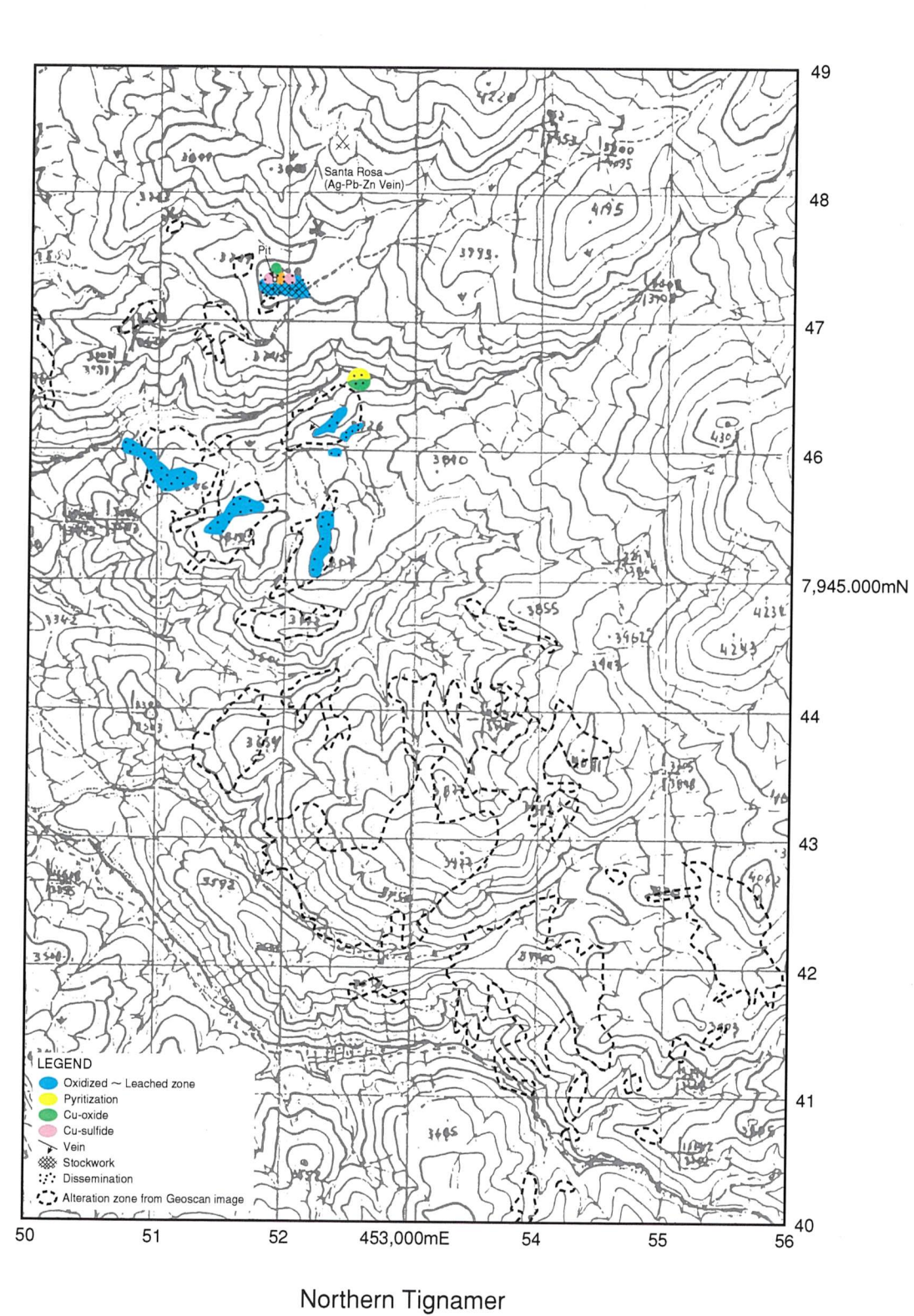
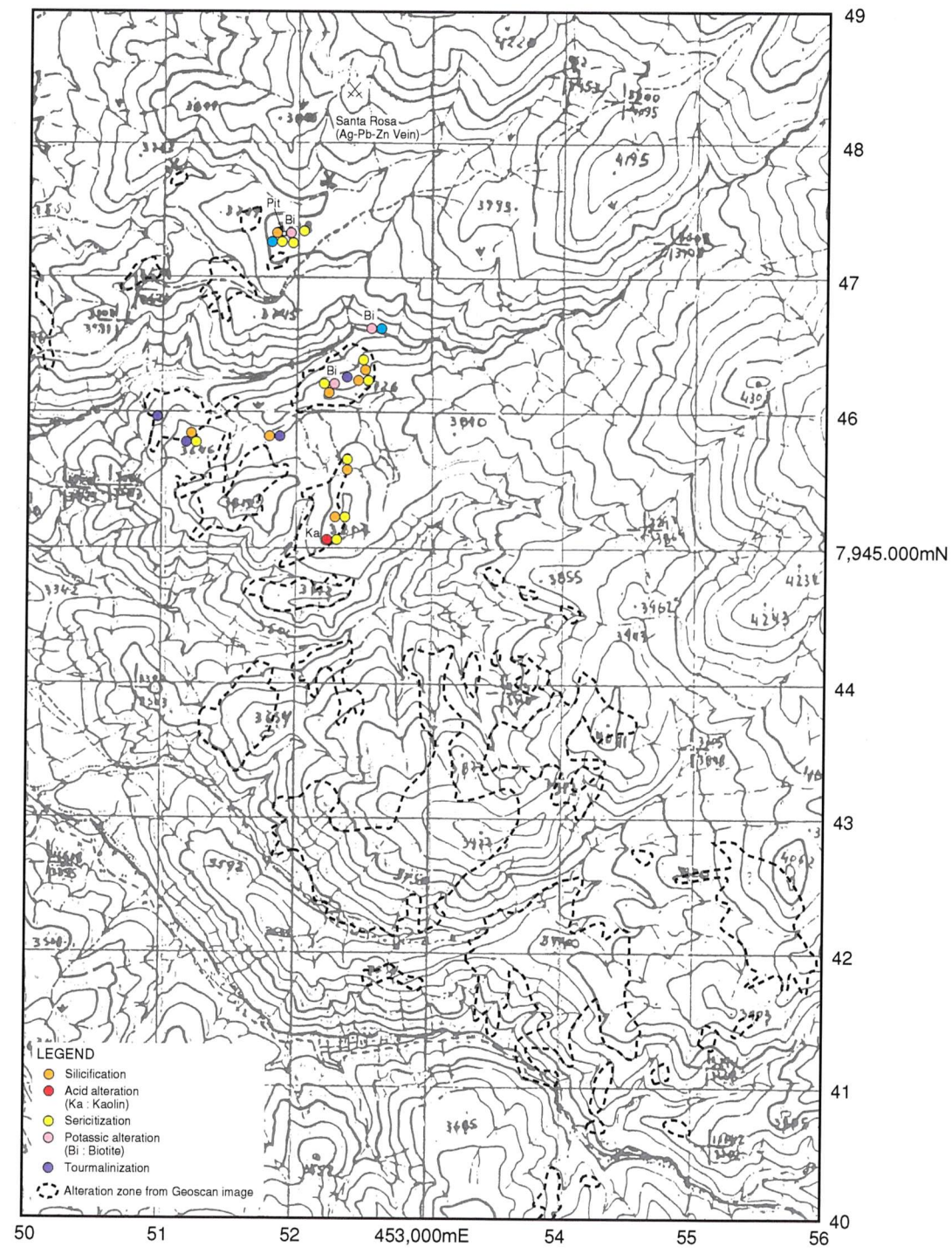
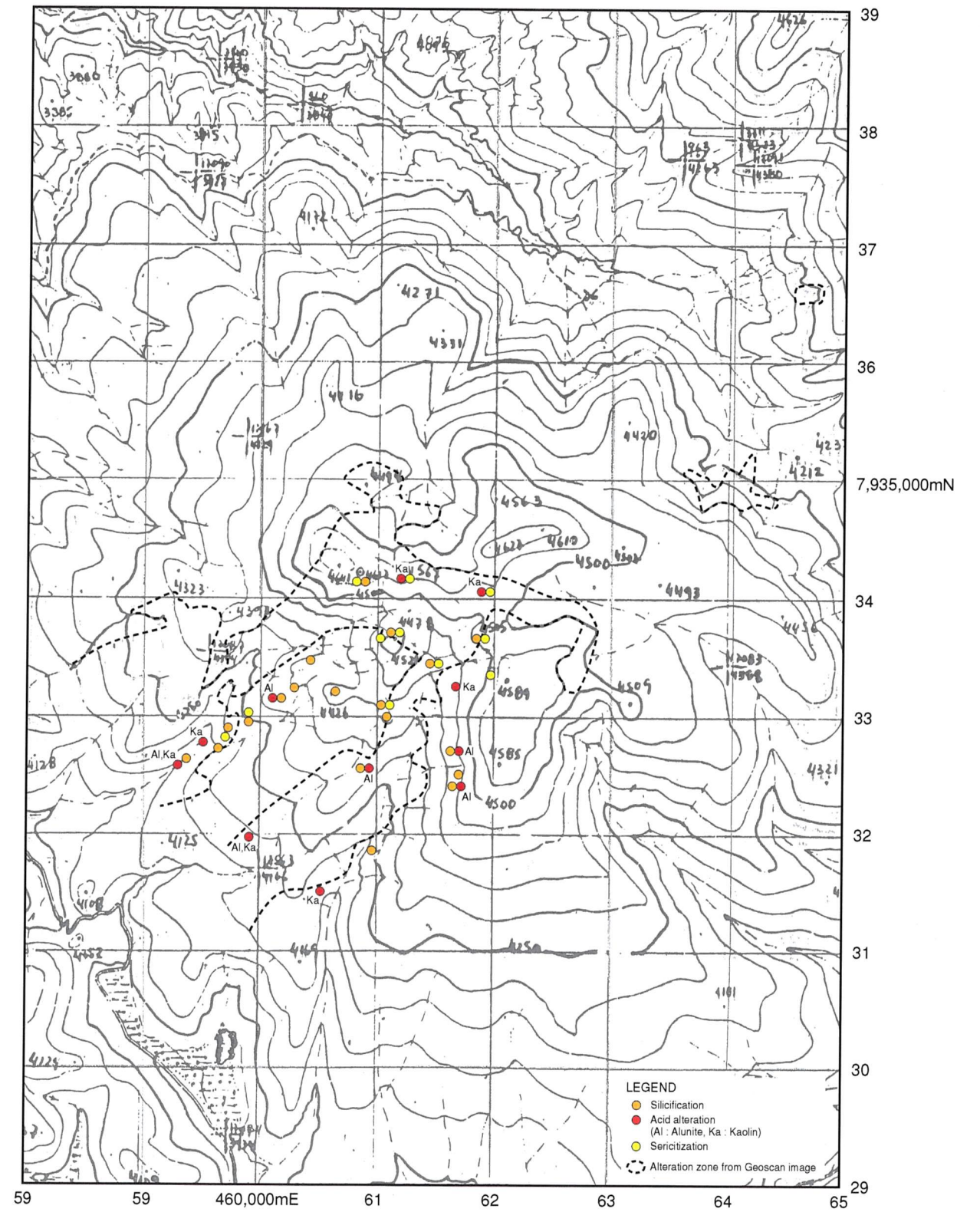


Fig. 2-2-33 Mineralization Map of the Tignamar Area

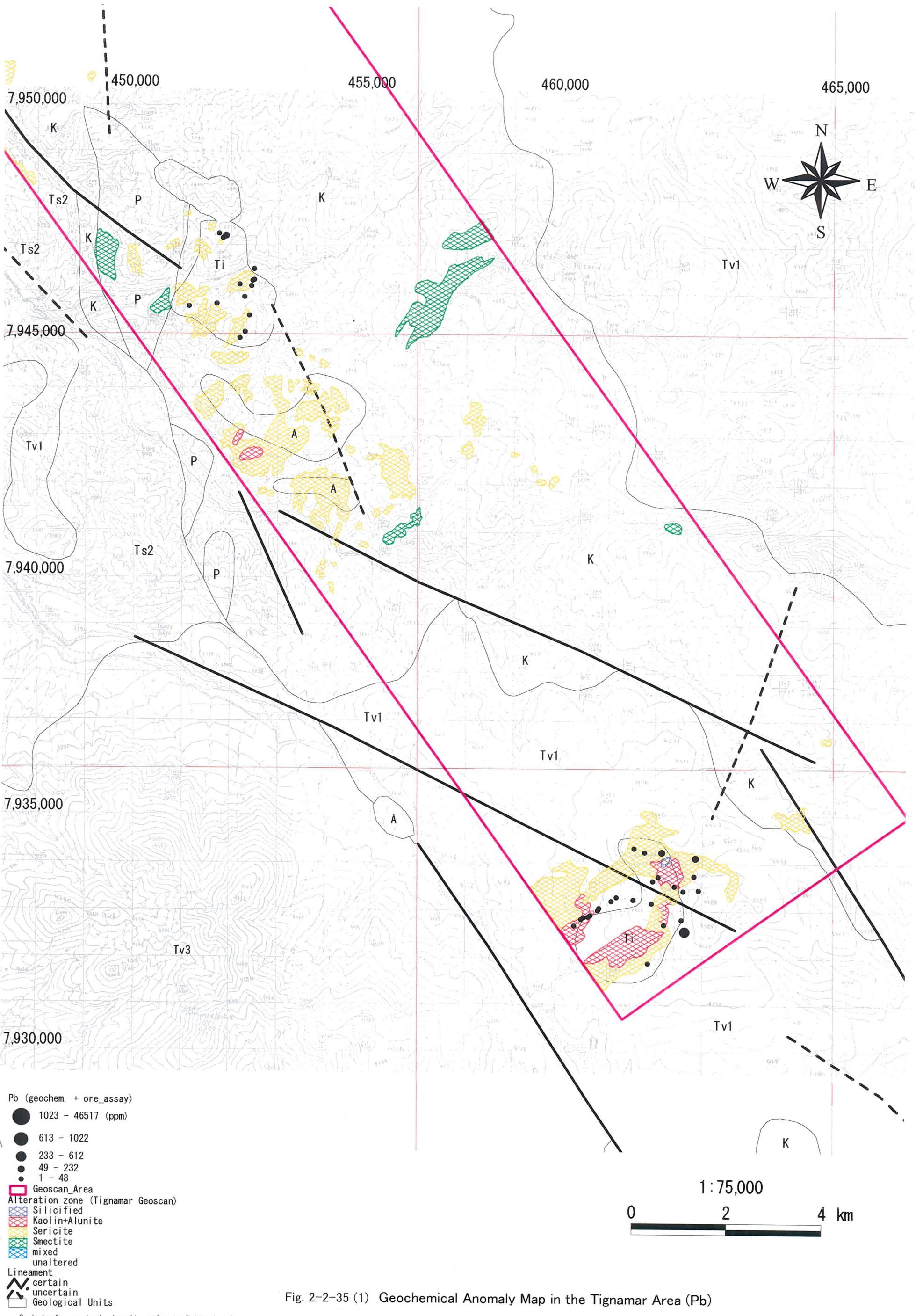


Northern Tignamer



Southern Tignamer

Fig. 2-2-34 Distribution Map of Alteration Minerals at the Tignamar Area

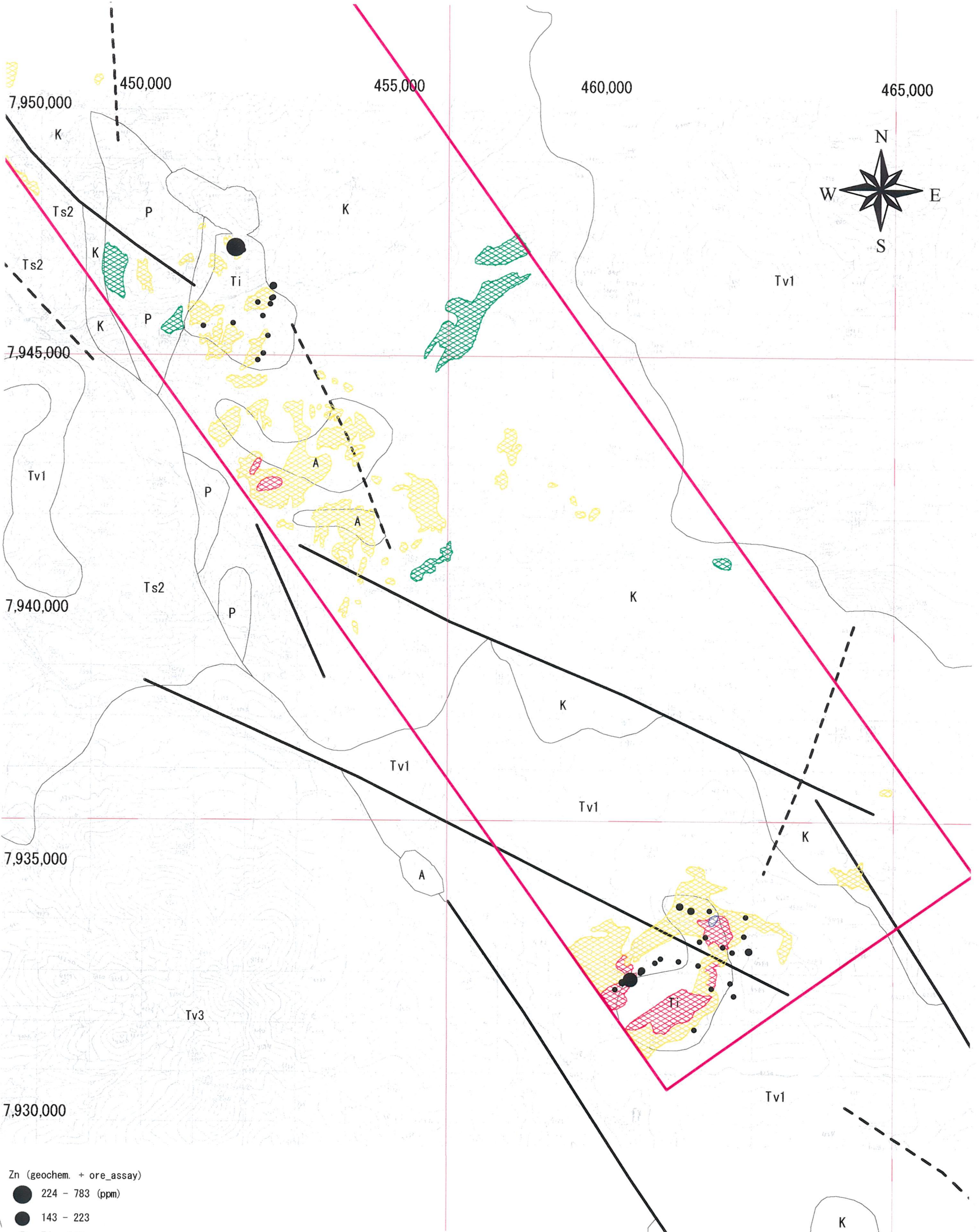


- Pb (geochem. + ore_assay)
 - 1023 - 46517 (ppm)
 - 613 - 1022
 - 233 - 612
 - 49 - 232
 - 1 - 48
- Geoscan Area
- Alteration zone (Tignamar Geoscan)
 - Silicified
 - Kaolin+Alunite
 - Sericite
 - Smectite
 - mixed
 - unaltered
- Lineament
 - certain
 - uncertain
- Geological Units

— 219 ~ 220 —

Fig. 2-2-35 (1) Geochemical Anomaly Map in the Tignamar Area (Pb)

Symbols for geological units refer to Table 1-3-1



- Zn (geochem. + ore_assay)
- 224 - 783 (ppm)
- 143 - 223
- 74 - 142
- 29 - 73
- 1 - 28
- Geoscan Area
- Alteration zone (Tignamar Geoscan)
- ▨ Silicified
- ▨ Kaolin+Alunite
- ▨ Sericite
- ▨ Smectite
- ▨ mixed
- ▨ unaltered
- Lineament
- ▬ certain
- ▬ uncertain
- Geological Units

1:75,000



Fig. 2-2-35 (2) Geochemical Anomaly Map in the Tignamar Area (Zn)

Symbols for geological units refer to Table 1-3-1

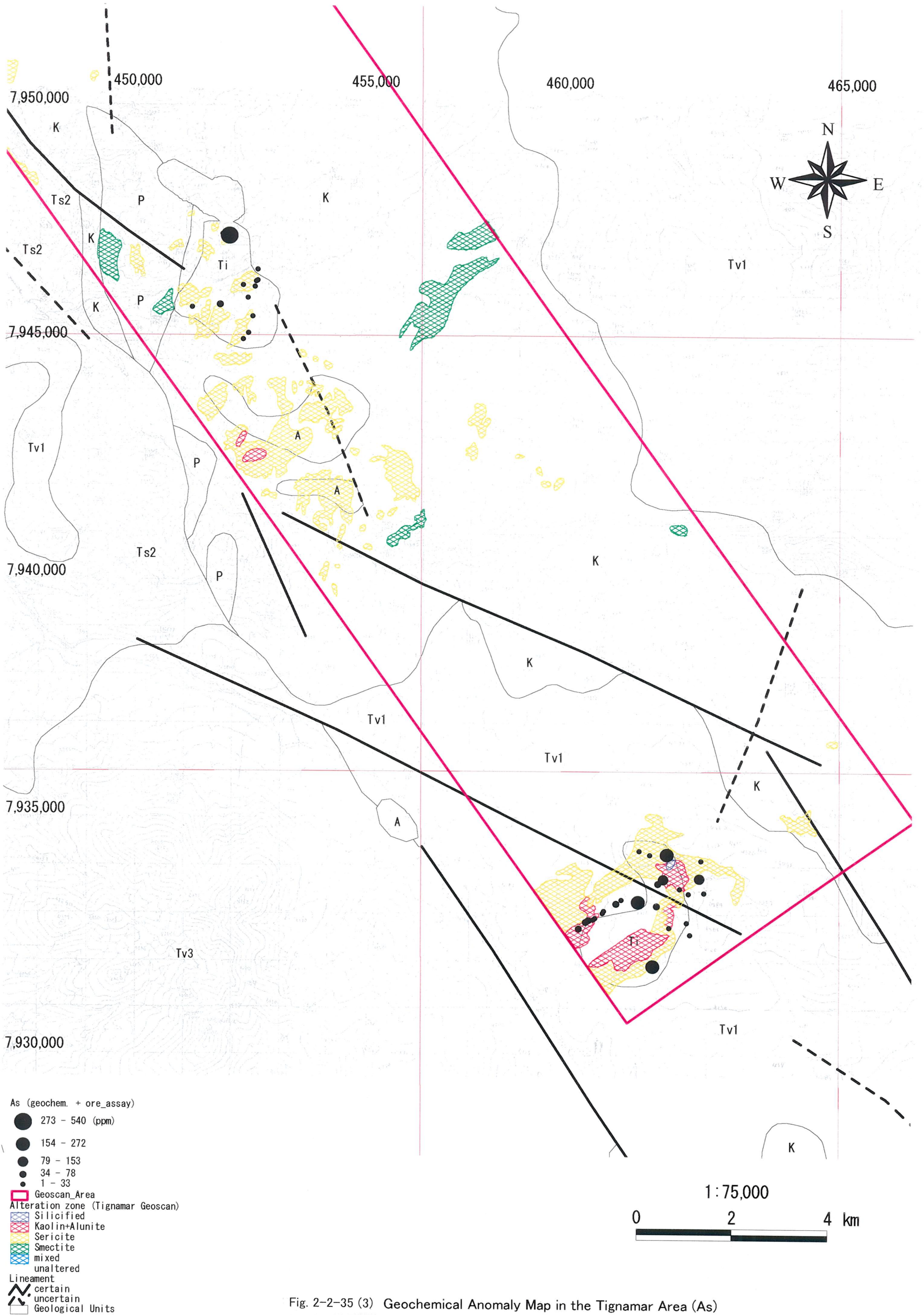


Fig. 2-2-35 (3) Geochemical Anomaly Map in the Tignamar Area (As)

As (geochem. + ore_assay)

- 273 - 540 (ppm)
- 154 - 272
- 79 - 153
- 34 - 78
- 1 - 33

Geoscan Area

Alteration zone (Tignamar Geoscan)

- Silicified
- Kaolin+Alunite
- Sericite
- Smectite
- mixed
- unaltered

Lineament

■ certain

■ uncertain

Geological Units

Symbols for geological units refer to Table 1-3-1