

Fig. 2-1-59 (2) Geochemical Anomaly Map in the Area to the East of Arica (Ag)

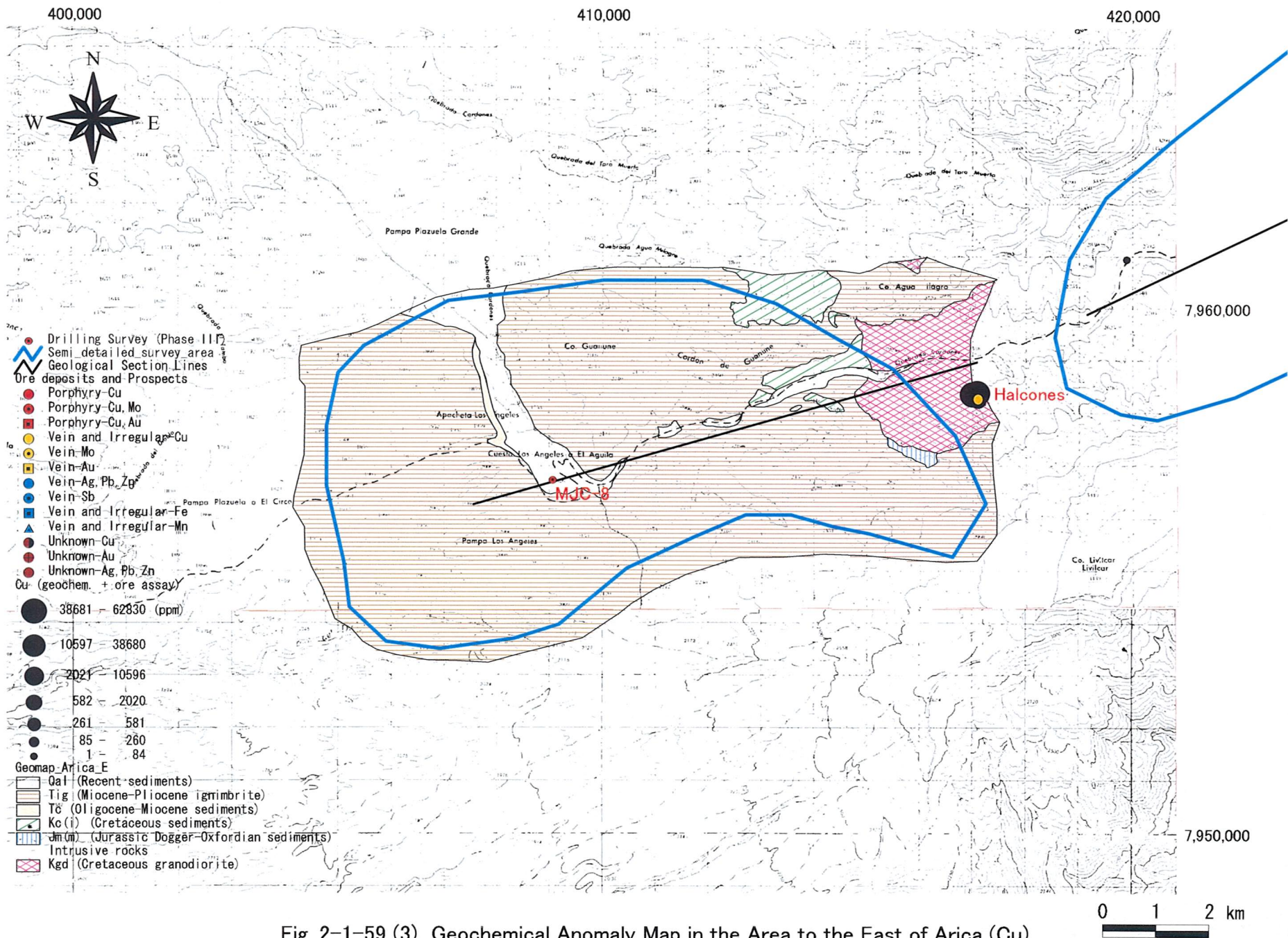


Fig. 2-1-59 (3) Geochemical Anomaly Map in the Area to the East of Arica (Cu)



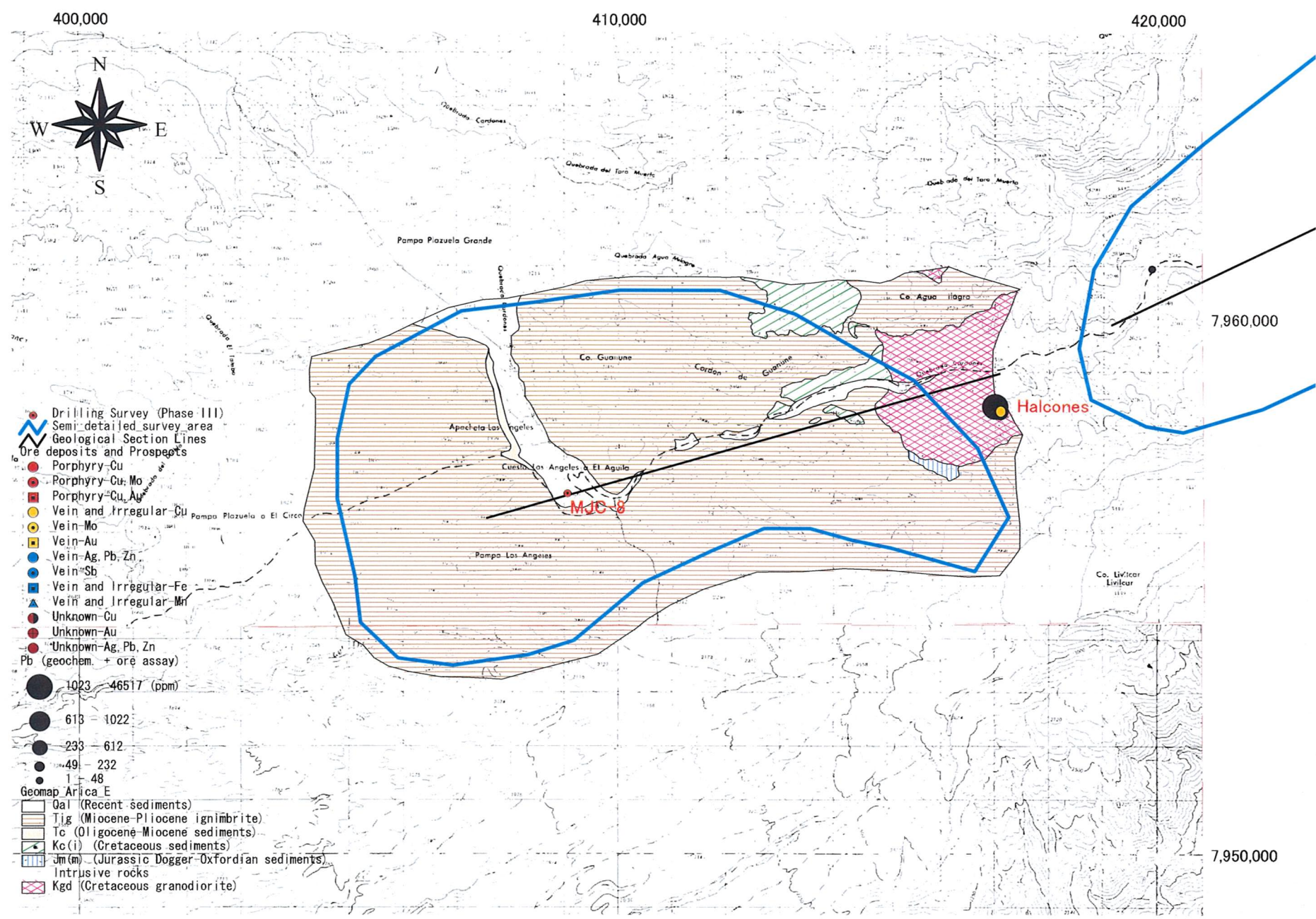


Fig. 2-1-59 (4) Geochemical Anomaly Map in the Area to the East of Arica (Pb)



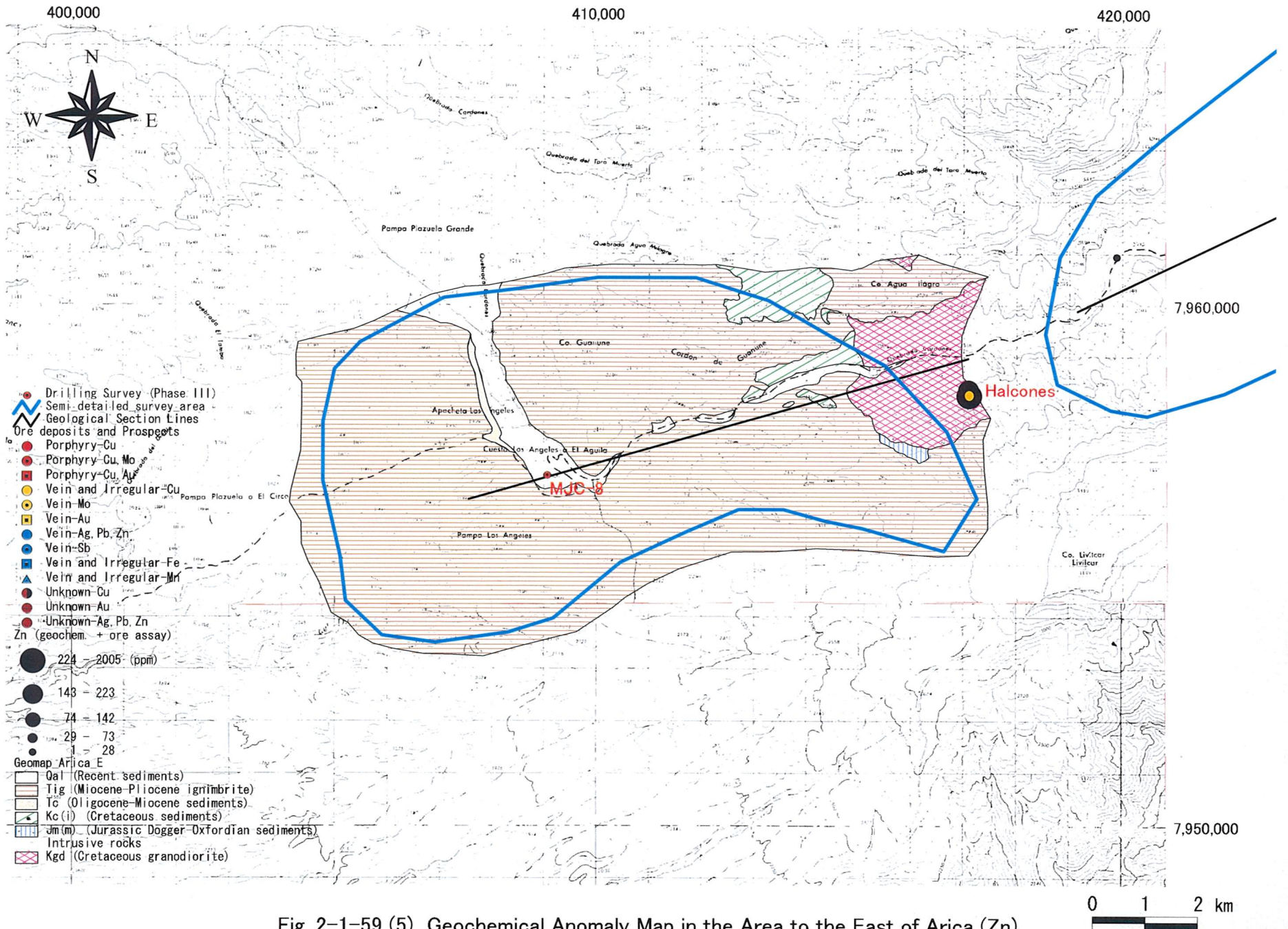


Fig. 2-1-59 (5) Geochemical Anomaly Map in the Area to the East of Arica (Zn)

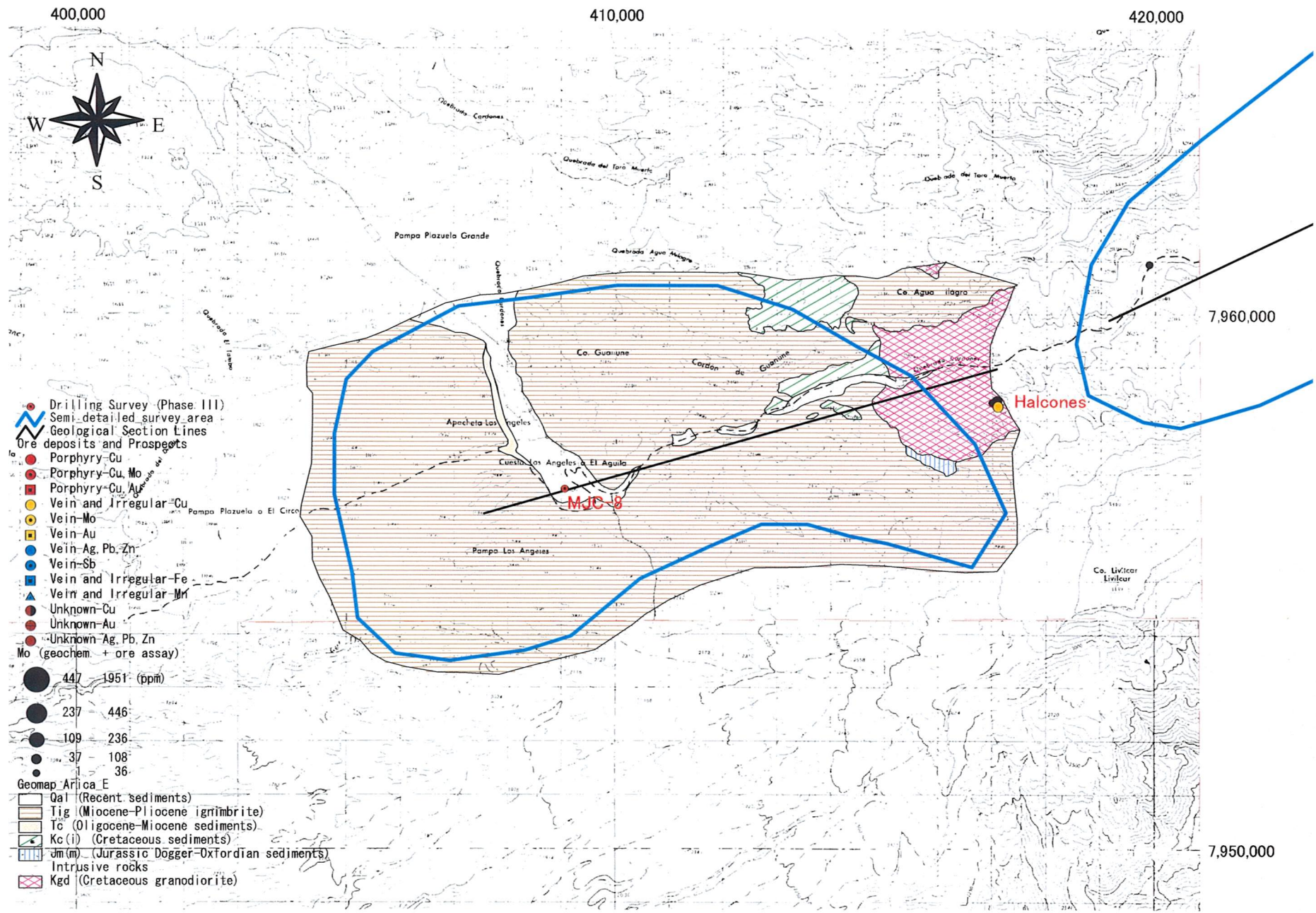


Fig. 2-1-59 (6) Geochemical Anomaly Map in the Area to the East of Arica (Mo)

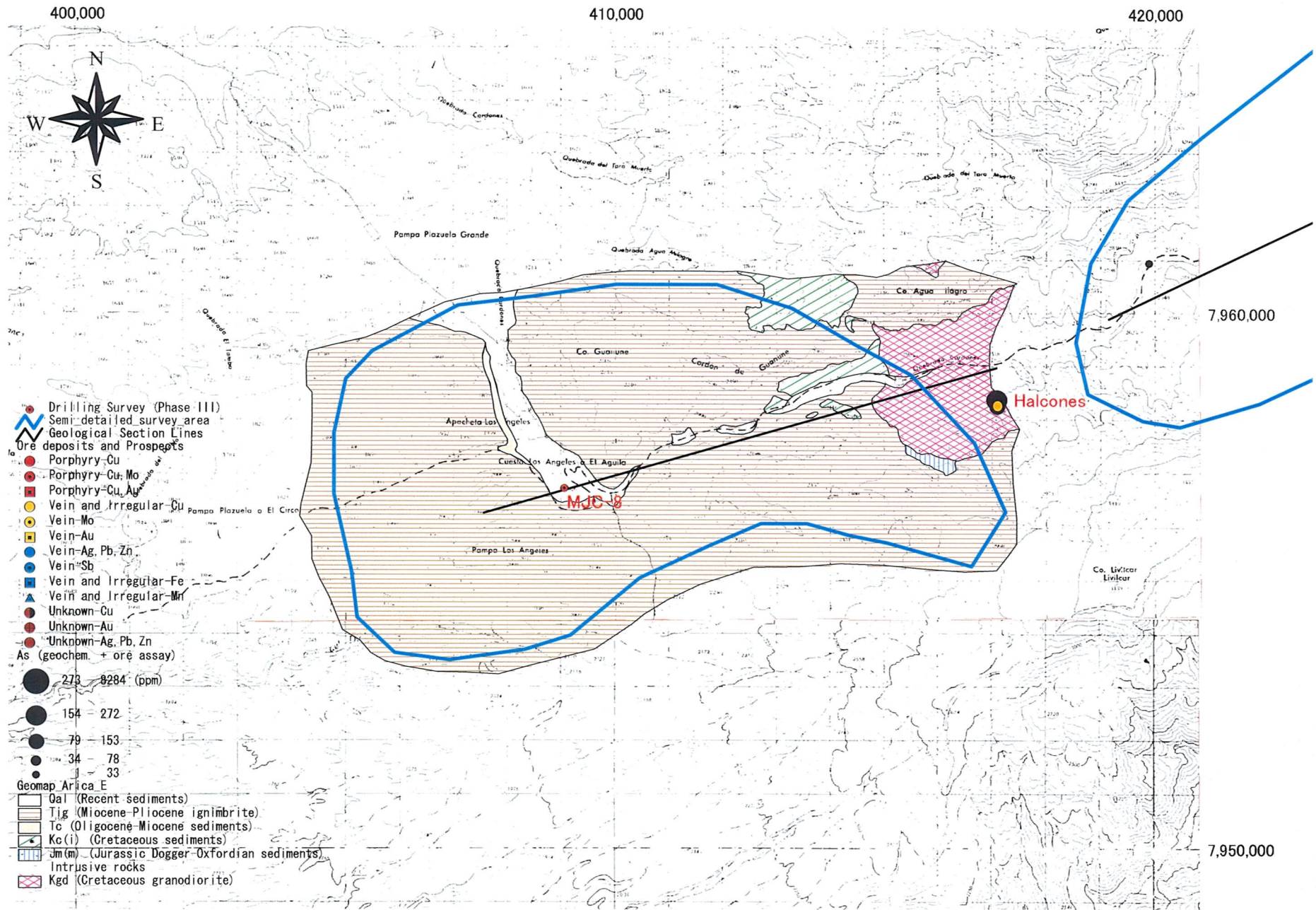


Fig. 2-1-59 (7) Geochemical Anomaly Map in the Area to the East of Arica (As)

for sericitized rocks.

The Upper Jurassic and Lower Cretaceous Systems and the above intrusive bodies are overlain unconformably by Tertiary units.

The Tertiary System is composed of Oligocene-Miocene conglomerate and unconformably overlying Miocene-Pliocene ignimbrite (rhyolitic welded tuff • pumiceous tuff).

The Quaternary System is alluvium.

In this area, a vein-type copper deposit (abandoned Halcones mine) occurs in granodiorite and the vicinity of the vein has been sericitized. One vein is exposed on the surface, and its attitude is N-S, 50E, and its width 0.8m, length more than 250m. The ore minerals are chrysocolla, malachite, antlerite, anglesite, plumbojarosite, cerussite, chlorargyrite, chalcocite, and pyrite. The gangue mineral is quartz. Fluid inclusions in the quartz are 2-phase vapor-liquid inclusion, and their mean homogenization temperature is 142.95° C indicating epithermal mineralization.

Au-Ag-Cu-Mo-Pb-Zn-As rock geochemical anomalies were detected in this area.

The Upper Jurassic System, Lower Cretaceous Systems, granodiorite bodies, and the vein deposit are located in a zone where the following four airborne magnetic zones overlap; intermediate intensity zone, periphery of medium wavelength high anomaly zone, medium wavelength low anomaly zone, and short wavelength high anomaly zone.

1-2-14 Area to the west of Putre

The sampling sites of this area are shown in Figure 2-1-60, geological map in Figure 2-1-61, schematic geologic columns in Figure 2-1-62, mineral showings in Figure 2-1-63, distribution of altered minerals in Figure 2-1-64, and rock geochemical anomaly distribution in Figure 2-1-65.

The geology of this area is composed of Lower Cretaceous System, Neogene System, Upper Neogene-Quaternary System, Quaternary System, and intrusive bodies.

The Lower Cretaceous System consists of sandstone and is intruded by granodiorite. The following K-Ar ages of weakly-altered intrusive rocks were obtained; 56.0 ± 1.5 Ma (sericite),

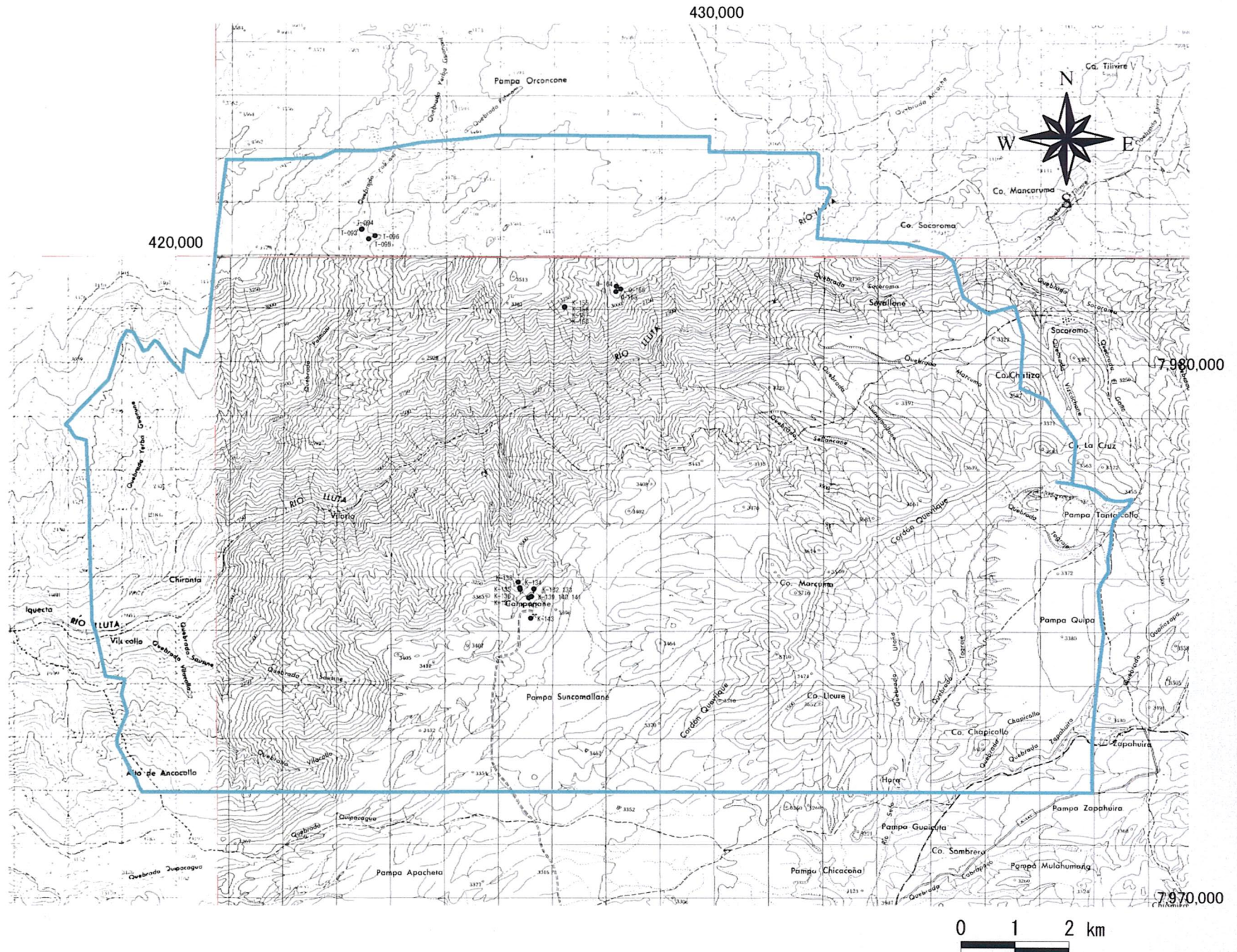


Fig. 2-1-60 Sample Location Map of the Area to the West of Putre

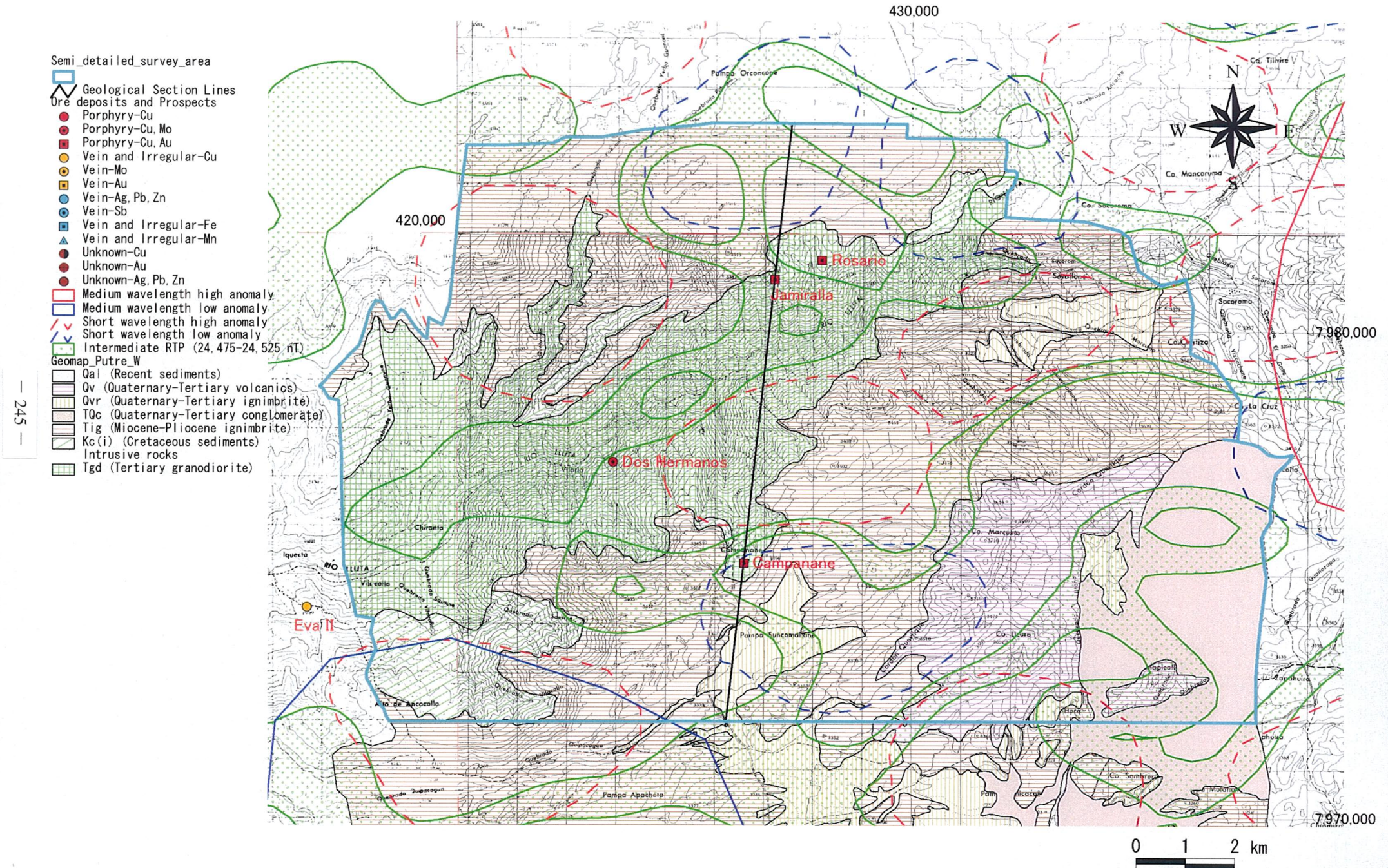
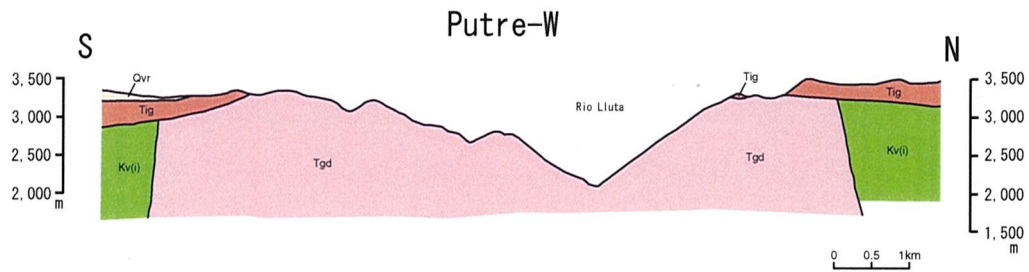


Fig. 2-1-61 Geological Map of the Area to the West of Putre



Geologic Time		Columnar Section	Lithology	Intrusives	Mineralization
CENOZOIC	QUATERNARY HOLOCENE	Gal	Alluvium	Granodiorite (Tgd) ↑	Porphyry copper type (py, sericite, tourmaline) ↑
	QUATERNARY ~ TERTIARY	Qv	Basalt lava		
		Qvr	Pumice tuff		
		Tqe	Conglomerate		
	TERTIARY	PLIOCENE ~ MIOCENE	Tig		
PALEOGENE					
MESOZOIC	CRETACEOUS LATE				
	EARLY	Ke(i) Tgd	Sandstone		

Fig. 2-1-62 Schematic Stratigraphic Columns and Profiles of the Area to the West of Putre

- Mineralization
- Pyritization
 - Cu-oxide
 - Cu-sulfide
 - Molybdenite
 - Oxidation
 - Native sulfur
 - Barite-limonite vein
 - none
- Semi_detailed_survey_area

- Geomap_Putre_W
- Qal (Recent sediments)
 - Qv (Quaternary-Tertiary volcanics)
 - Qvr (Quaternary-Tertiary ignimbrite)
 - TQc (Quaternary-Tertiary conglomerate)
 - Tig (Miocene-Pliocene ignimbrite)
 - Kc(i) (Cretaceous sediments)
 - Intrusive rocks
 - Tgd (Tertiary granodiorite)

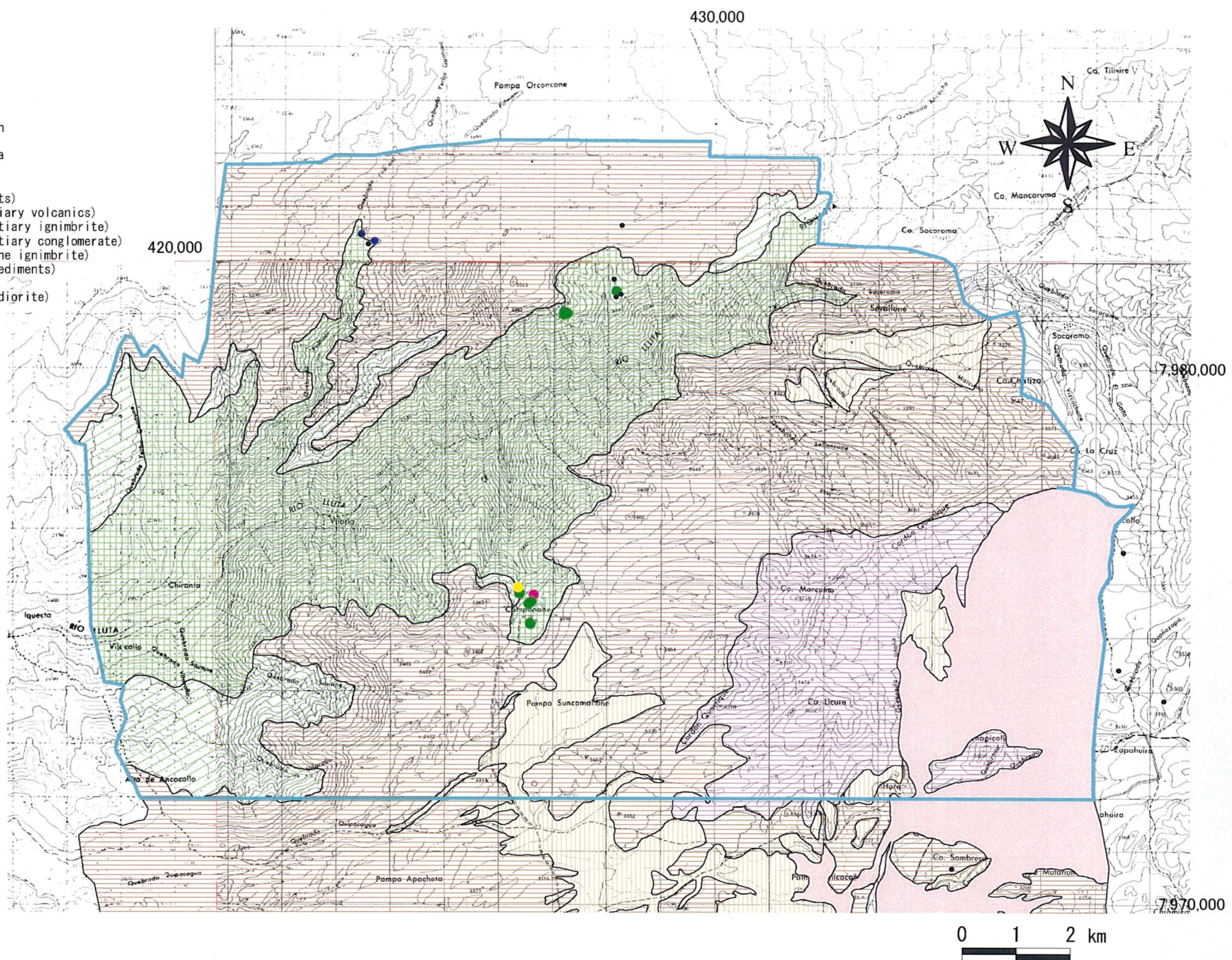


Fig. 2-1-63 Mineralization Map of the Area to the West of Putre

- Alteration
 - Silicification
 - Acid alteration
 - Sericitization
 - Propylitization
 - Potassic alteration
 - Tourmalinization
 - none
- Alteration zone (from TM images)
- Semi_detailed_survey_area
- Geomap_Putre_W
 - Qal (Recent sediments)
 - Qv (Quaternary-Tertiary volcanics)
 - Qvr (Quaternary-Tertiary ignimbrite)
 - TQc (Quaternary-Tertiary conglomerate)
 - Tig (Miocene-Pliocene ignimbrite)
 - Kc(i) (Cretaceous sediments)
 - Intrusive rocks
 - Tgd (Tertiary granodiorite)

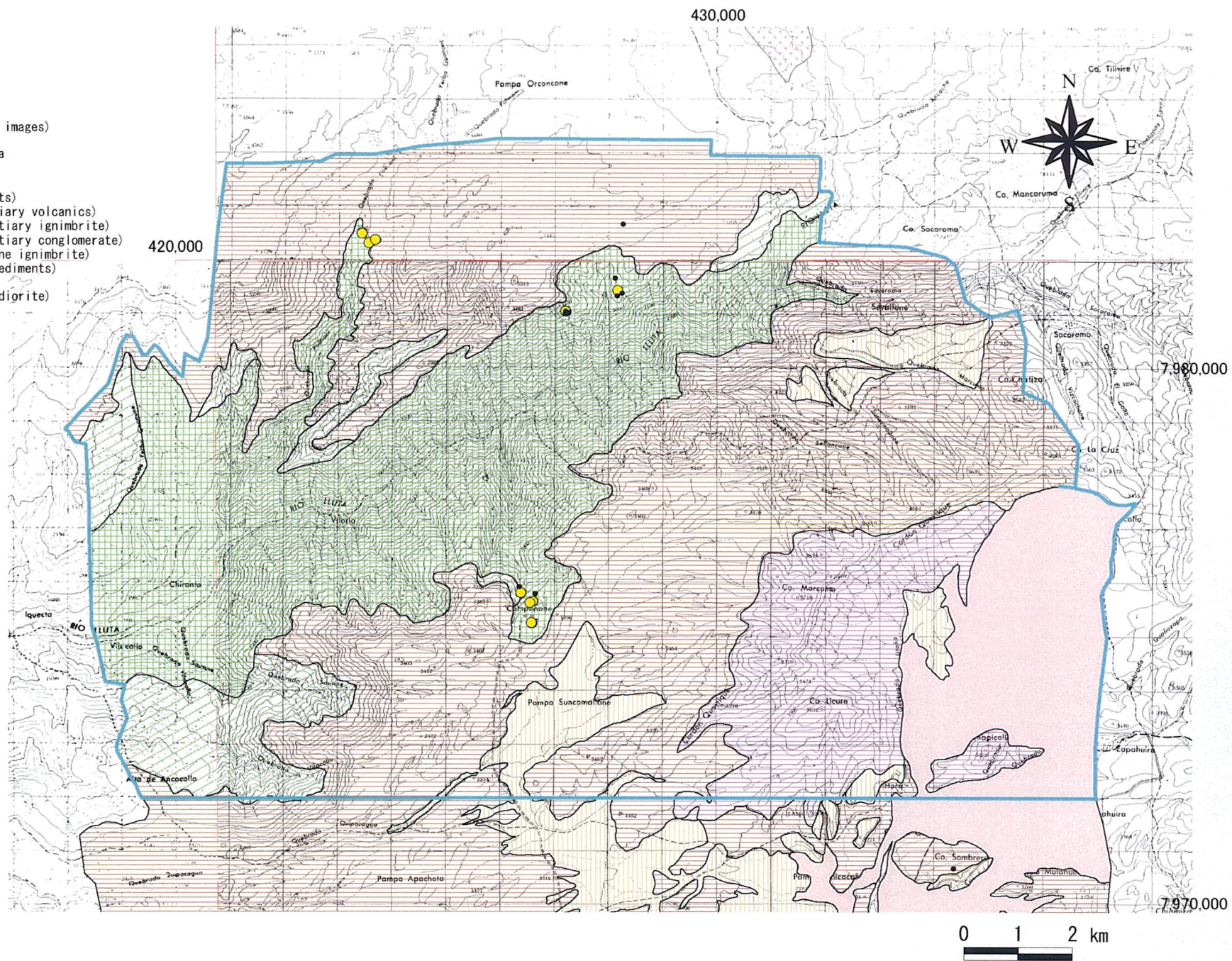


Fig. 2-1-64 Distribution Map of Alteration Minerals at the Area to the West of Putre