

Chapter 5 Conclusion and Recommendation

5-1 Conclusion

As the 3rd phase survey, a survey of two boreholes in the Santiago Salinas district, a detailed geological survey and a survey of two boreholes in the Capire district, a detailed geological survey and a survey of two boreholes in the La Campana district were conducted and existing data was collected and analyzed.

As a result of the drilling surveys (MJZC-4 and MJZC-5) in the Santiago Salinas district, a mineralization zone mainly composed of pyrite, which corresponds to the continuation of a mineral showing distributed on the district, was intersected at the boundary (several centimeters) between the lower volcanic rocks of the Villa Ayala Formation and the sedimentary rocks. The chemical analysis showed that the highest grade was 0.247% of Ba and 330 ppm of Zn.

The geological survey of the Capire district revealed that the geology of this district consists of lower volcanic rocks (various types of andesite and dacitic tuff), sedimentary rocks (calcareous slate, limestone, and tuff), upper volcanic rocks (dacitic tuff and various types of andesitic tuff), and andesitic intrusive rock of the Villa Ayala Formation in this order from the bottom. Mineralization and alteration was discovered in the Capire and Aurora 1 deposits in the sedimentary rocks. A pyritic dissemination zone and thin layer were recognized at the boundary between the lower volcanic rocks and sedimentary rocks near the Tlanilpa mineral showing. The geochemical survey extracted geochemical anomalies near the Aurora 1 deposit, in the western part to northwestern part of the Capire deposit, in the eastern part of the Tlanilpa mineral showing. On the basis of the results obtained, two drilling surveys (MJZC-6 and MJZC-7) were conducted in the eastern part of the Tlanilpa mineral showing. At MJZC-7, interbeds of pyrite, tuff, and slate, which correspond to an extension of the Tlanilpa mineral showing, were intersected over about 10m. These interbeds, which indicated only 1,300 to 2,000 ppm of Ba, are poor in Pb and Zn.

The geological survey of the La Campana district found that the geology of this district consists of lower volcanic rocks (various types of foliated andesite, foliated tuff, andesite, and dacitic tuff), sedimentary rocks (interbeds of calcareous slate, tuff, and

limestone), and upper volcanic rocks (dacitic tuff and vitric tuff) of the Villa Ayala Formation in this order from the bottom. Mineralization and alteration include Manto Rico deposit and La Campana mineral showing occurred in the sedimentary rocks. An alteration zone accompanied by a remarkable pyritic dissemination was recognized in foliated tuff (lower volcanic rocks) of the western to northern part of the district. The geochemical survey extracted geochemical anomalies in the southern part of the Manto Rico deposit, in the eastern part of the Otates Village, and in the western to eastern part of the La Campana mineral showing. On the basis of the results obtained, two drilling surveys (MJZC-8 and MJZC-9) were conducted in the eastern and western parts of the La Campana mineral showing. At MJZC-8, a thin-layer (several centimeters) mineralization zone mainly composed of pyrite, sphalerite, galena and chalcopryrite was discovered to depths at 80 to 120 m in several places. The chemical analysis showed 26 ppb/Au, 11.7 ppm/Ag, 0.268%/Cu, 1.69%/Pb, 3.94%/Zn, 1,920 ppm/Ba, and 3.65%/Fe at a depth of 83.7 m and 176 ppb/Au, 47.5 ppm/Ag, 0.231%/Cu, 1.28%/Pb, 1.33%/Zn, 44 ppm/Ba, and 8.20%/Fe at depths of 115.7 to 116.0 m. Foliated tuff in the lower volcanic rocks is accompanied by a strong pyritic dissemination and Zn has a grade of 455 ppm, which is a slightly high value.

Collection and analysis of the existing data clarified that a small mineralization zone mainly composed of Pb-Zn had been discovered in the sedimentary rock of the Villa Ayala Formation in various places. According to the existing data, an ore body of 1.2 mt having an average grade of 73 g/t of Ag and 1.13% of Zn is found at a shallow depth over an area covering the Aurora 1 deposit and the Capire deposit. The IP survey revealed that the distribution of the ore body is included in the IP anomaly area of 20 mV or more.

From the above results obtained, the mineralization (mainly pyritic) that occurs at the boundary between the lower volcanic rocks and the sedimentary rocks recognized from the Santiago Salinas district to the Capire district was identified over a wide area, and it was expected that the mineralization would have grown into an ore body containing Pb and Zn as in the case of the Tizapa deposit. There is little possibility that Tizapa-type mineralization may occur in this district.

Existing deposits containing Pb and Zn scattered in the Aurora district are mainly composed of small lenticular ore bodies that occur in the sedimentary rock of the Villa Ayala Formation. Similar mineralization has been discovered at MJZC-8 in the present survey and some existing boreholes. There are many similarities between these existing deposits and the Rey de Plata deposit as a mineralization type. However, small ore showings spread out over a wide area, large ore bodies are not formed. They may be of little commercial value in terms of scale and grade.

5-2 Recommendation

The Zacualpan area has massive sulfide deposits and vein type deposits that mainly consist of Pb and Zn. The massive sulfide deposits have similar characteristics as the Rey de Plata deposit. These deposits, which are distributed in the Aurora area in the central part of Zacualpan area, include the Manto Rico, Aurora, and Cruz Blanca deposits. The deposits are formed together with sedimentary rock in the upper zone of the Villa Ayala Formation during intervals of volcanic activities. However, the Zacualpan area is unlikely to have centralized ore bodies, thereby having small potentials for finding large-scale economical deposits.

Meanwhile, great Guerrero Terrene, including this Zacualpan area, is known as having many massive sulfide deposits and occurrences such as the Tizapa deposit and the Rey de Plata deposit although some areas in Guerrero Terrene have undergone no detailed geological surveys until today. Thus, further surveys could lead to finding blind deposits in the Guerrero Terrene

The relation (concept of deposit horizon) between volcanic activities in the Villia Ayala Formation and mineralization, which has been clear in our survey, can be applicable to explorations of massive sulfide deposits in Guerrero Terrene. Accordingly, we estimate that further review of the geology in Guerrero Terrene could lead to extracting areas with high potentials for deposits.

Small mining of vein type deposits, which mainly consisting of Zn, Ag, and Pb, is conducted in the vicinity of Zacualpan. Since similar mineralization is formed vein type deposit zones in the NW-SE system, small- and medium-sized high grade vein type deposit could be found in areas where no substantial exploration has been carried out yet.