

The Role of Oligocene Volcanism to Develop Ag-Au-Pb-Zn-Cu Mineralization at San Marcial Area, Western Sierra Madre Occidental, Sinaloa, Mexico

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The Plomosas District and San Marcial Area (PDSMA) host multiple Ag-Au-Pb-Zn-Cu mineralization events, from an early Cretaceous Cu porphyry setting to Eocene high-sulphidation Ag epithermal veins, and Oligocene high-grade Ag-Cu-Pb-Zn-Au tectono-hydrothermal breccias, located at the southern end of the Sierra Madre Occidental (SMOc) in Sinaloa, Mexico. Recent field observations, detailed petrography, U/Pb, and Ar-Ar age dating of the entire stratigraphic sequence were used to characterize the evolution of multiple mineralization styles and obtain new insights into the evolution of the southern extension of the SMOc. The PDSMA does not have a typical SMOc stratigraphic column. The local basement is composed of non-deformed Late Jurassic volcanoclastic units and coeval felsic intrusions, crosscut by the root of Laramide intrusive. Early to late Oligocene silicic ignimbrites, intermediate lava flows, and occasional basalt flows directly overlie the Jurassic basement and Laramide intrusive, separated by an angular discordance. Several Oligocene coarse intermediate porphyry bodies and a few Miocene rhyolitic domes intrude the PDSMA stratigraphy. Within the Oligocene volcanic sequence an angular discordance separates an early and a late period. The recent studies presented here highlight the importance of overprinting explosive volcanism in the genesis of the multiple mineralization episodes in the PDSMA and in the southern SMOc.