

Discoveries of Fresnillo Plc: The Silver Giant in Mexico

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An integrated exploration program focused on 4 Mexican mining districts has thrust Fresnillo Plc into the forefront of world silver production. Similarities mark the Fresnillo and Saucito mines in Zacatecas, the Cienega and San Julian mines in Durango and Chihuahua respectively, and exploration projects in the re-born Guanajuato District.

In each case silver, with gold, lead, and zinc credits, is contained in Oligocene epithermal veins systems with mineralization extending vertically over 500 to 700 meters, and 1 to 10km along strike. Whereas several orebodies outcrop at Cienega, San Julian, and Guanajuato, the principal Fresnillo and Saucito veins barely reach to within 200 meters of present day surface. Structures typically vary from 1 to 20 meters width and are characterized by multiple stages of quartz displaying colloform, cockade, and breccia textures. The ore minerals are pyrargyrite and argentite, with argentiferous galena and sphalerite increasing at depth.

At the Fresnillo District, which boasts silver resources in excess of 1.3 Boz in the namesake and Saucito mines, exploration is challenging since the vein system is both blind and covered by post-mineral materials, in the low relief Mexican Central Mesa. Successful exploration methods include mapping, soil and float geochemistry and a variety of geophysical methods aimed at targeting the subtle alteration signature of the mineralized structures into the host rocks. Results are carefully evaluated to determine position with respect to the ore horizon within the veins.

Exploration at the Cienega District includes detailed geochemical and structural assessment of mineralized showings and alteration zones occurring in abrupt areas of the Sierra Madre Occidental. A persistent exploration effort has been carried out since the opening of the mine in 1994, leading to a current resource of 144 Moz of silver guaranteeing a minimum of 8 years of remaining mine life. Recent discoveries include the Casas del Bajo vein and the San Ramon-Cebollitas vein system, which still offer excellent exploration potential.

The new San Julian mine in construction displays a silver resource of 200 Moz in two different types of ore bodies: (i) typical low-sulphidation epithermal veins and (ii) disseminated sulphides in subvolcanic and volcanic felsic rocks. Exploration strategy involved early recognition of Cienega-style characteristics providing confidence in the geologic model, and persistence when evaluating the non-typical disseminated mineralization.

Guanajuato is a well-known historic mining district with an estimated production in excess of 5 Moz of gold and 1 Boz of silver. Due to its excellent infrastructure and exploration potential, Fresnillo plc is committed to investigate the multiple under-explored areas of the region through a combination of conventional geological mapping and geochemical surveys at favorable structural settings determined by expert analysis of outcrops and top technology remote sensing.

All of these districts also contain significant gold resources, currently standing at 3.7, 1.6, and 0.9 Moz at Fresnillo, Cienega, and San Julian districts, respectively. The geological targeting at all locations is followed by intensive and carefully-located core drilling directed towards fast-tracking the discoveries into the appropriate resource category.