

Vectoring to Feeder Zones Through Integrated Orebody Characterization: The La Manchuria Low-Sulfidation Epithermal System, Argentina

Diego Guido¹, Luciano Lopez¹, Gerardo Páez¹

¹CONICET-UNLP (INREMI), La Plata, Argentina

The La Manchuria Au–Ag project, located within the Jurassic low-sulfidation epithermal province of the Deseado Massif, Argentina—the country’s most prolific Au–Ag producing region, hosting world-class deposits such as Cerro Vanguardia and Cerro Negro—provides a compelling case study on how integrated orebody characterization can resolve fluid pathways and vector toward feeder zones in partially concealed systems. Mineralization is hosted by Jurassic volcanoclastic rocks intruded by andesitic bodies and locally obscured by post-mineral breccias and younger cover, hindering recognition of ore controls.

Gold–silver mineralization occurs as NW- to NNW-trending arrays of banded quartz–adularia veins and veinlets, representing the shallow expression of a vertically extensive hydrothermal system. A key challenge is distinguishing laterally extensive vein arrays from vertically focused feeder zones capable of hosting high-grade shoots.

A revised geological model integrating structural analysis, lithological controls, and alteration mineralogy, supported by ~19,000 m of drilling, demonstrates that high-grade mineralization is controlled by NW-oriented extensional structures linked to regional fault systems. Andesitic intrusions likely played a key role in fluidization processes, interacting with volcanoclastic sequences containing variable organic matter, potentially enhancing metal precipitation. Hydrothermal alteration defines a coherent system architecture: illite–smectite assemblages reflect high-temperature fluids proximal to upflow zones, whereas advanced argillic assemblages (kaolinite ± NH₄-bearing alunite) record steam-heated overprints. Propylitic alteration delineates distal margins and reinforces vectoring toward concealed feeders.

Drilling guided by this model intersected high-grade mineralization along strike and beneath post-mineral cover. Notable intercepts include 1.4 m grading 35.34 g/t Au and 8,356 g/t Ag, and 1.6 m grading 75.09 g/t Au and 87 g/t Ag, confirming vertically continuous feeder-related structures and strong potential for further discoveries.

These results demonstrate that integrating structural and alteration frameworks within an orebody characterization approach provides an effective strategy to discriminate feeder zones from vein arrays and to unlock blind mineralization in mature epithermal districts.