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The Roots of the Maria Teresa Zn-Pb-Cu-Ag-Ba Deposit in the Mid-Cretaceous Coastal VMS Belt of Peru

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Recent drilling down to 700 m beneath the ore-bearing horizon of the Zn-Pb-Cu-Ag-Ba deposit of María Teresa, 85 km N of Lima, in the Mid-Cretaceous VMS coastal belt of Peru, has allowed us to gain insight into the roots of the deposit and, together with new underground and surface observations, to construct an idealized 1000-m-thick stratigraphic column of the volcanic sequence in the area.

Main results are the following:

-The sequence is solely of volcanic nature. Unlike in certain ore deposits of the belt, no sedimentary intercalations are found. This, combined with the calc-alkaline signature of the volcanic rocks, suggests that the deposit formed in the subduction-related volcanic arc itself.

-The volcanic sequence is not exclusively constituted by basaltic andesites and andesites as previously assumed; dacitic lavas also occur.

-The ore bodies are preferentially hosted in dacitic and basalt-andesitic autobreccias, partly hyaloclastitic. Increased permeability possibly favored fluid mixing and mineralization in this horizon.

-Intense sericitic alteration with Al>70% affects volcanic rocks down to 150 to 200 m below the ore-bearing horizon. The transitions towards the underlying and overlying volcanic rocks, mostly affected by ocean floor-style alteration, are relatively sharp, in particular towards the latter.

-In deeper parts, only short intersections with intense sericitic alteration are recorded. They are interpreted as being produced by cross-cutting sub-vertical feeders.

-Several intervals with up to 10% pyrite are registered, mainly but not only in rocks with sericitic alteration.

-Metamorphic mottled or Dalmatian texture is abundant in drill cores near a tonalitic intrusion located to the east. Where affected by intense sericitic alteration, mottled texture extends slightly farther to the west, suggesting that moderate-temperature sericitic alteration is more easily affected by contact metamorphism than less altered lavas.