

Geologic evolution of the Cerro Quema Au-Cu deposit, Azuero Peninsula (Panama)

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Central America hosts a variety of metallic mineral resources including Au, Cu, Ag, Pb, Zn, Ni, Co, Sb, W, and Al, spanning a broad range of deposit types. In Panama, Au and Cu are the most economically important metals, and they are mainly related to epithermal and porphyry copper systems.

Cerro Quema is a high sulfidation epithermal deposit located in the Azuero Peninsula (SW Panama), it is constituted by several mineralized bodies named from W to E: La Pava, Cerro Quemita and Cerro Quema. Estimated Au resources are 7.23 Mt with an average gold grade of 1.10 g/T. Cerro Quema is located in the fore-arc basin of the Panamanian Cretaceous volcanic arc. It is related to an E-W trending regional fault system, and is hosted by the dacite dome complex of the Río Quema Formation (Campanian to Maastrichtian in age).

Hydrothermal alteration consists of an inner zone of nearly pure quartz (vuggy silica alteration), with local quartz-alunite and pyrophyllite alteration (advanced argillic alteration), enclosed by a kaolinite, illite and illite/smectite-bearing zone (argillic alteration), grading to an external halo of propylitic alteration.

Gold occurs as disseminated submicroscopic grains and “invisible gold” within the pyrite lattice. Copper is associated to Cu-bearing phases such as chalcopyrite, enargite, tennantite, covellite and chalcocite.

Cerro Quema was formed by fluids derived from the emplacement of an underlying porphyry copper intrusion emplaced along E-W trending regional faults located in the Cretaceous fore-arc basin, during Paleogene times. The proposed geologic model suggests that high sulfidation epithermal deposits are not exclusive of volcanic edifices or volcanic domes related to subduction zones. This deposits can also occur in fore-arc basins, associated with acidic intrusions located between the volcanic arc front and the subduction trench. This should be taken into account for exploration in geologically similar terranes.