The Cordero discovery Chihuahua, Mexico: A novel Ag, Au, Zn, Pb type subvolcanic and volcanic porphyry system

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The Cordero bulk tonnage Ag, Au, Zn, Pb discovery near Hidalgo Del Parral, Chihuahua, Mexico is exposed on the surface. Mineralization occurs within four Tertiary igneous intrusive centers that include a diatreme, a dacite/rhyolite volcanic dome complex, a zone of composite dacite and rhyolite subvolcanic stocks, and a limestone capped composite dacite stock. Country rocks are Cretaceous silty limestones. Geomorphological evidence indicates that the volcanic felsic dome complex forms preserved constructional volcanic topography. The domes emerged to the paleosurface during synmagmatic mineralization and volcanism. Mineralization and alteration zoning patterns indicate the mineralization represents a novel Ag, Au, Zn, Pb porphyry type system and a third apex on a trinodal diagram illustrating porphyry Cu, Mo, and now Ag/Au/Zn/Pb type deposits. Argentiferous galena, sphalerite, and pyrite are the principal sulfide minerals. Within the felsic dome and subvolcanic stocks, the sulfide minerals occur disseminated, in stockwork veins, and in mineralized intrusion contact breccias and diatreme breccias. In cross section, sulfides correlate with the lower portions of phyllitic alteration zones and the upper portions of potassic alteration zones within each mineralized intrusive center. Alteration assemblages are typically strong and pervasive, with potassic alteration defined by potassium feldspar flooding and by locally abundant secondary, felt hydrothermal biotite. Barren potassic alteration typically cores mineralized shells and is surrounded by mineralized potassic, phyllic, argillic, and propylitic alteration zones going outward from the centers of mineralization. Limestone country rocks are generally well mineralized in contact zones of the domes and subvolcanic intrusives and range from potassic to chloritic hornfels to manto replacements. Rusty weathering carbonate proxies for silica in all alteration assemblages in the upper 200-300 m of the system. Silica is present and increasingly abundant in alteration assemblages at depths below 200-300 m. Alteration zoning is less well defined within the diatreme, as limestone breccia clasts and country rocks are typically unaltered. Diatreme mineralization was synmagmatic and associated with multiple ages of mineralized dacite and rhyolite dikes, which are also cut by diatreme brecciation. Cross cutting relationships document multiple mineralizing events and complex paragenesis with at least eight stages of mineralization. Late stage barite-calcite-sphalerite dominant stockwork veining cuts the entire Ag, Au, Zn, Pb porphyry system. Younger Cu/Mo granodiorite porphyry hosted mineralization cuts the Ag, Au, Zn, Pb porphyry at depth as revealed in one deep hole in a northeastern part of the drill grid. Cordero was discovered beginning in 2009. Since then 274 core holes (126,916 m) have been drilled to define a central mineral resource and initially explore outlying targets. The latest June, 2012 in situ indicated mineral resource contains 547.70 million tonnes grading 18.54 g/t Ag, 0.054 g/t Au, 0.51% Zn, and 0.27% Pb (contained metal: 364.0 Moz Ag, 0.945 Moz Au, 6.1 billion lbs Zn, 3.3 billion lbs Pb; $6 NSR cutoff at $25/oz Ag, $1,000/oz...
Au, $1/lb Zn & Pb). Current 2013 and 2014 drill results from a newly acquired claim in the center of the past resource are now being incorporated into a resource update.