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JDS

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Comments. Thanks
Hamb

Abstract of the Geology of the Santa Cruz Porphyry Copper Deposit
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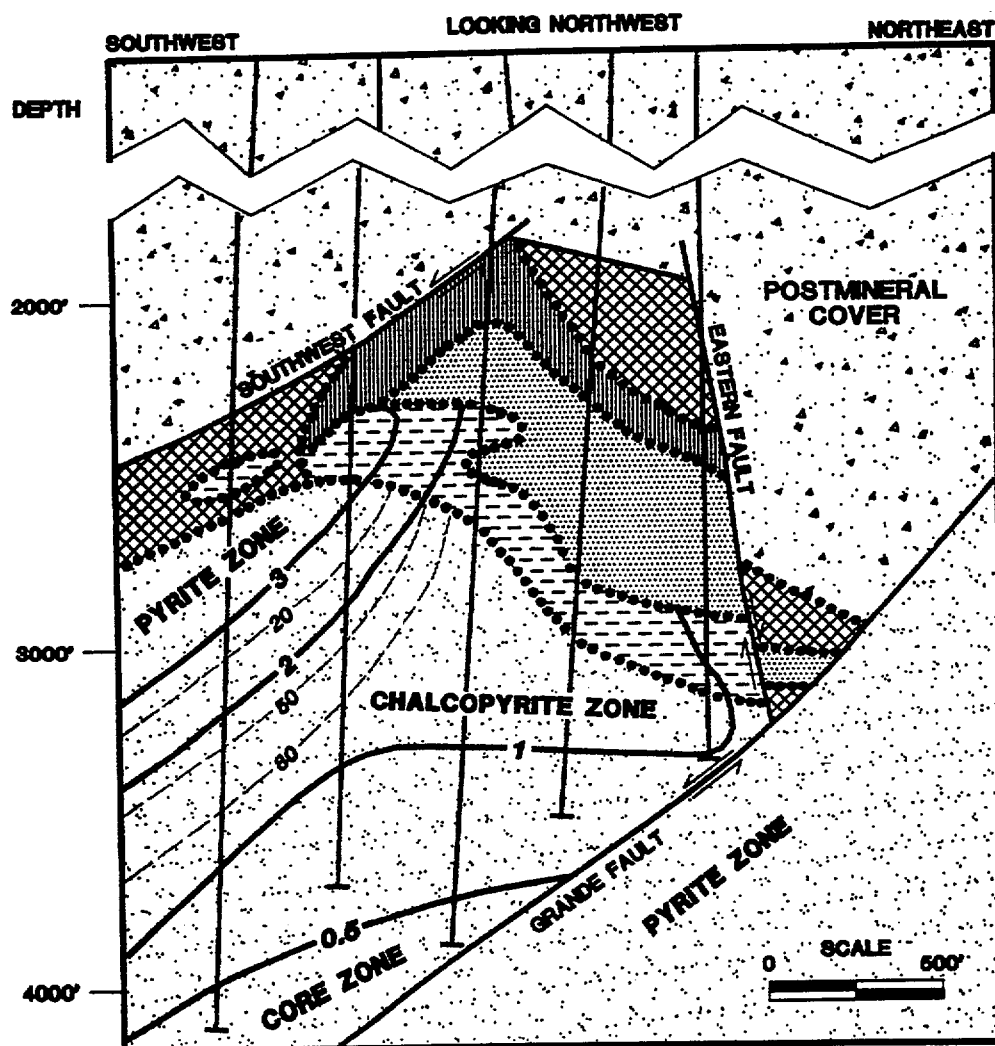
The Santa Cruz porphyry copper deposit is located seven miles west of Casa Grande, Arizona and less than six miles southwest of Asarco's Sacaton deposit. Associated alteration and mineralization, including that of fault displaced portions (such as the Sacaton deposit), is about seven miles long and about a mile wide. Explored portions of the deposit contain a reserve base in excess of 350 million tons at 1% total copper. The reserve base is part of an identified resource of 1.5 billion tons at 0.6% total copper. The reserve base and the identified resource are expected to increase as a result of future exploration.

The deposit's present day shape, extent, and depth of burial are predominantly the result of horst-graben faulting, tilting, and low angle faulting associated with basin-range formation. Except for one small outcrop at the Sacaton mine, all alteration and mineralization is covered by up to 3500' of postmineral alluvium, conglomerate, sandstone, and minor amounts of volcanic rocks.




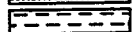

Host rocks in and about the deposit are comprised of 82% Precambrian granite (locally known as Oracle granite), 15% Laramide biotite-quartz-feldspar porphyry dikes (quartz monzonite to granodiorite compositions), and 3% Precambrian diabase dikes and other rock types.

Hypogene sulfide mineralization and alteration of the Santa Cruz deposit and the intrusion of the porphyry dikes are Late Cretaceous in age. Hypogene sulfide mineralization consists of chalcopyrite, pyrite, and local bornite. These sulfide minerals exhibit a zoning pattern from the inner, deeper to outer portions of the deposit as follows: core zone, chalcopyrite zone, and pyrite zone. The core and chalcopyrite zone host rocks are altered by biotite-orthoclase-sericite. Host rocks in the outer chalcopyrite zone and pyrite zone are altered by quartz-sericite. A cross section of the deposit is shown in Figure 1.

Prior to burial of the Santa Cruz deposit by postmineral cover, hypogene sulfide mineralization near the paleo ground surface was subjected to multiple cycles of oxidation and enrichment. This resulted in locally abundant atacamite, chrysocolla, and chalcocite mineralization in a supergene zone that is up to 2000' thick in vertical drill holes. Relatively minor quantities of exotic copper mineralization occur in the overlying clastic and volcanic rocks.



COPPER MINERALIZATION

-  Leached capping
-  Chrysocolla and atacamite
-  Atacamite
-  Chalcocite
-  Chalcopyrite

SULFIDE DISTRIBUTION

-  2 — Total sulfides, volume percent contour
-  60 — Chalcopyrite, percent of total sulfides contour

Figure 1. Cross section through the southwestern portion of the Santa Cruz deposit.