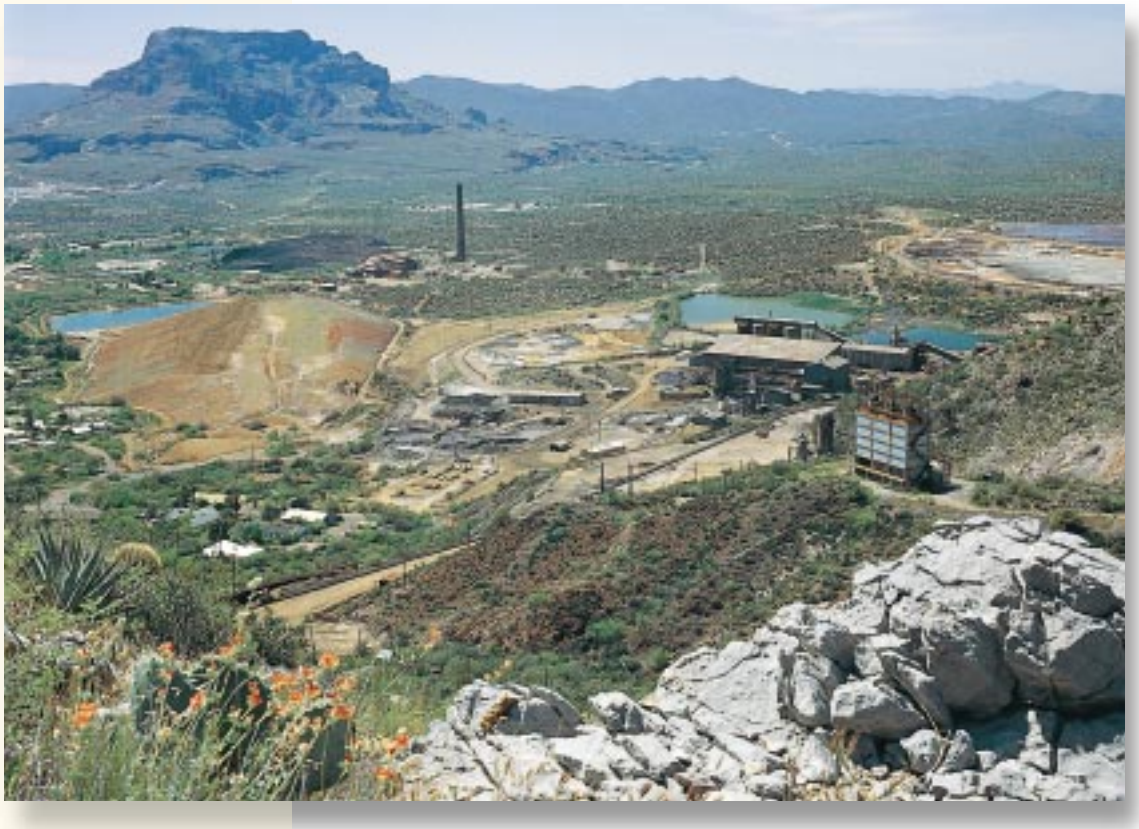
Streamlining the Aquifer Protection Permitting Process

Brown and Caldwell facilitated the aquifer protection permitting process for Superior Mine by initiating a formal partnering relationship with Arizona regulatory agencies and creating a well defined, cost-effective facilities assessment plan.



BROWN AND CALDWELL

Background

Superior Mine was one of the oldest underground copper mines in Arizona. It produced a rich copper ore using traditional drift and stope ore-extraction techniques. Because the operation continuously pumped groundwater and processed copper ore, the mine's owner needed to secure an Aquifer Protection Permit, which is required by the state for all discharging facilities.

To secure the permit, BHP-Copper (formerly Magma Copper Company) had to demonstrate thorough understanding of the site's complex geologic and hydrogeologic conditions. Other requirements included assessments of waste streams – from the groundwater pumped out of the mine to the interaction of storm water with tailings and stockpiles of waste rock. Superior Mine had a well-established record of environmental compliance, and BHP wanted to preserve this record during continued operations and eventual closure.

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Solutions

Brown and Caldwell facilitated the permitting process by taking the following steps:

- Initiating a formal partnering relationship between BHP, regulators, and Brown and Caldwell to expedite permitting. The increased communication and participation of all parties significantly reduced permit review time, and BHP's company ethic helped build trust with the regulators. In general, the permitting process became more efficient.

- Preparing a facilities assessment plan that focused the scope of work and identified priority areas for investigation, including tailings impoundments, waste rock stockpiles, mill and concentrator complex, water conveyance and treatment systems, and mine openings.

- Focusing characterization efforts by working with BHP staff to inventory potential waste streams. Data was cross-referenced with lists of facilities exempted by either the Arizona Department of Environmental Quality or the general permit rules.

- Using broad characterization techniques to group facilities into general classifications. For example, numerous facilities in the site's mill area were lumped together in one classification. Consequently, fewer assessments were required, saving time and money.

- Developing Best Available Demonstrated Control Technologies (BADCT) to control and mitigate discharges, as part of the ongoing permit process. Existing site conditions are expected to serve as BADCT for many locations.

- Performing stable isotopic studies of core samples to reveal lithostratigraphic information that described the depositional history of the unconsolidated alluvium. This information helped define groundwater flow characteristics, a required permit component.