

## **Case Study 1: Passive Treatment of Metal Mine Drainage at an Abandoned Mine near Lake Shasta, California**

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The Golinsky Mine is an abandoned underground base metal mine in Shasta County, California, within the Shasta-Trinity National Forest. In 2010, a biochemical reactor (BCR) with a treatment capacity of 10 gallons per minute (gpm) was constructed to address onsite acid rock drainage (ARD). The system design was based on the results of three months of onsite bench-scale testing in 55-gallon drums followed by two years of pilot-scale testing in an aboveground 1 gpm capacity BCR.

Conducting the bench and pilot tests and construction of the full-scale BCR was significantly challenged by the site's remote location (all construction materials were barged across Lake Shasta) and rugged mountainous terrain. The fully passive treatment system has functioned unattended since installation and is achieving an approximate 95% metal removal rate and relatively neutral pH. Projected longevity of the BCR media is approximately 20 years. Annualizing the \$1.3 million construction cost, which was funded by the American Recovery and Reinvestment Act, over the total expected flow for two decades indicates a unit treatment cost of about 1.3 cents per gallon of ARD.