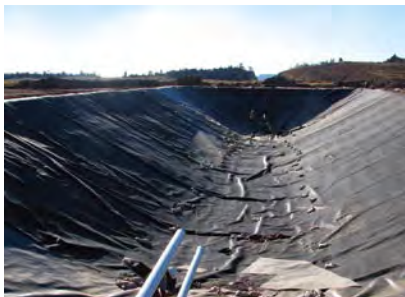


# Projects

ERRG is constructing a groundwater extraction and treatment system at the Nacimiento Copper Mine, in the Santa Fe National Forest of New Mexico. Copper was mined from the Aqua Zarco Sandstone at the Nacimiento Copper Mine using a number of shallow shafts and adits from 1880 to 1970. From 1970 to 1984, copper ores were mined from an open pit which resulted in the topography currently present at the site. From 1984 to 2000, in-situ leaching was pilot tested to recover copper. The acids injected during the pilot testing contaminated the groundwater, and it is this groundwater contamination that is the target of this remedial action.



The groundwater is currently heavily laden with metals (aluminum, copper, iron, magnesium, zinc) and has an average pH of 3.59. Geologic conditions beneath the site have limited ground water migration. The extraction system being constructed includes nine extraction wells, located in the bottom of the open

mine pit. These wells will penetrate through the Aqua Zarco Sandstone at depths between 250 and 450 feet below ground surface. The nine wells are expected to extract a combined volume of 120 gallons per minute over the anticipated four year operational life of the system. Extracted groundwater is pumped to a pair of collection tanks before being pumped out of the mine pit to the treatment system.

The ground water treatment system is a semi-passive alcohol enhanced bioreactor system. The system includes a large settling basin (850,000 gallon capacity) within which sodium hydroxide will be metered into the extracted groundwater to neutralize the pH and precipitate some of the metals. Ground water will then pass into a large cobble filled bioreactor (300,000 gallon capacity) within which ethanol will be metered into the water to provide nutrients for the naturally occurring bacteria which will extract the remaining metals. The treated ground water will then be discharged to a nearby stream which is being modified to handle the significantly increased flow that will result from the treatment system.

## Mine Extraction and Treatment System, Santa Fe National Forest

### SUMMARY

**Owner**

U.S. Forest Service

**Location**

Nacimiento Copper Mine  
Santa Fe National Forest, NM

**Award Date**

June 2007

**Actual Completion Date  
or Projected Completion Date**

November 2008

**Award Amount**

\$2,668,000

**Final Contract Price**

Ongoing

**Services Provided**

Construction of a Bio-Reactor  
System Start-up and O & M



**Engineering/Remediation Resources Group, Inc.**

Office Locations > Martinez, San Francisco, Los Angeles, Tustin, Seattle, Portland, Honolulu  
Website > [www.errg.com](http://www.errg.com)