

Heap Leach Drainage

Safford, Arizona

In the year following the wick drain installation by Keller, copper production increased significantly at the mine.



The project

A copper mine in Safford, AZ uses an ore extraction process called heap leaching. Engineers needed to limit the application rate of the extraction solution to maintain slope stability. This resulted in a reduced recovery rate of the leachate solution. Over time preferred flow paths developed within the ore pile reducing the volume of ore exposed to the leaching solution.

The challenge

The site had pockets of ore that had decomposed from gravelly to clayey materials. The low permeability of these materials trapped the leachate solution in the pile, resulting in perching/slow percolation and reduced mine production. Additionally, the solution needed to reach depths nearly 200 feet below the surface.

The solution

Wick drains, also known as prefabricated vertical drains (PVDs), were installed on a 25-foot-square grid pattern across the 244-acre site. The drains were installed to a depth of 180 feet, reaching the underdrain layer. Installation of the wick drains provided significant improvement of leachate circulation throughout the degraded layers of ore deposits.

Project facts

Owner(s)

Freeport-McMoRan

Keller business unit(s)

Keller

Main contractor(s)

Keller

Engineer(s)

URS Corporation and Golder Associates

Solutions

Ground improvement

Markets

Mining

Techniques

Wick (PVD) drains

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