HISTORY OF THE LONDON MINE

The London Mine, located near Alma, Colorado (16 miles south of Breckenridge), was one of the highest producing gold mines in Colorado history. Active mining occurred from 1874 to the 1940s, however, limited mining activity took place until its closure in 1991. In addition to gold, the mine produced silver, lead and zinc. It is one of some 230 inactive water producing mines in Colorado.

ENVIRONMENTAL ISSUES

The geology of the mountain, including a reverse-thrust fault within the mountain, creates a natural underground reservoir that fills with the area’s abundant snowmelt. Miners dug 70 miles of tunnels within the mountain to excavate gold and other precious metals. Like many old mines, when rocks containing sulfur are exposed to water and oxygen via the tunnels, sulfuric acid forms. This process allowed naturally occurring minerals such as zinc and cadmium to enter the water. For decades, impacted water left the London Mine through two tunnels flowing into the South Mosquito Creek.

Agencies with the state of Colorado and contractors worked to clean up the London Mine water for many years. In 1997, the state funded a passive water treatment system and settling ponds along South Mosquito Creek, systems that intermittently removed contaminants from mine water before they reached the creek and the watershed. However, the efforts were insufficient and over the next 20 years, regulatory agencies and private industry worked without success to resolve the water quality issues.

CLEANUP WELL UNDERWAY

In 2014, MineWater, a Colorado company that invests in mines and cleans up heavy metal contamination at sites across the U.S., began collaborating with regulators and the mine’s owners to develop a cleanup strategy.

In 2016, the state of Colorado and the mine’s owners entered into an agreement that allowed MineWater to purchase 3,000 acres of the mine’s land holdings and water rights. MineWater agreed to perform all work under a Consent Order and Settlement Agreement with the Colorado Department of Public Health and Environment (CDPHE), including bringing water discharged by the London Mine into compliance with the discharge permit limits.

Employing innovative and proven cleanup strategies used at other mines, including the emergency cleanup its team conducted for the EPA at the Gold King Mine release into the Animas River, MineWater began implementing a cleanup plan at the London Mine in 2017.

In just one year, MineWater has brought the London Mine into compliance and the water discharged now meets all the requirements of the State’s agreement. MineWater implemented an on-site treatment system that injects natural substances into the mine water pool that reverses the acid process and neutralizes the water.

From October 2016 to October 2017, MineWater reduced levels of zinc 85 percent and cadmium levels were cut by more than 92 percent. The water being discharged from the mine is now practically indistinguishable from the stream water it enters.

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As part of the cleanup plan, MineWater will also be dewatering the mine in areas where there is naturally occurring sulfur. This will prevent the co-mingling of rock, water and oxygen that creates acid mine drainage. The water table of the underground reservoir will be lowered by pumping water out of two wells that are currently being installed. The clean water will then be pumped and released to the stream through permitted processes.

WATER IS GOLD

In the semi-arid West, water is as valuable as gold. With Colorado’s population projected to double by 2060 and a predicted water shortfall of 163 billion gallons by 2050, the state has developed a multi-prong plan to meet its future needs.

The London Mine’s water right is particularly valuable and sustainable. Because the water can be used for all uses—municipal, industrial, and agriculture—and it is fully consumable, meaning it can be used and reused, the water is useful for municipal water providers.

The mine’s natural underground reservoir holds an estimated 100,000 acre-feet of water. That is far more water than what is stored in the Aurora Reservoir. Its water decree allows about 5,300 acre-feet to be withdrawn annually. An acre-foot is approximately enough to supply two families of four, water needed for one year.

The reservoir holds far more water than what can be legally removed annually. And because it is water being stored in an underground reservoir, when the water is transferred for municipal use, it will not deplete existing streams and rivers. The release of water through the pumping will increase flows in the stream, improve habitat for fish and deliver more clean water into the ecosystem. In fact, it will add almost 4,000 acre-feet annually to the South Mosquito Creek, which eventually flows into the South Platte.

Water once used for mining repurposed for other uses meets many of the goals outlined in Colorado’s Water Plan. The cleanup and use of the London Mine water not only protects the environment, it provides water for municipal use while avoiding trans-basin diversions and agriculture dry up. Using true Western innovation, it is parlaying a mine once used to extract precious gold to a mine that will produce equally precious water. It is a model for how water issues at other historic mines can be productively addressed.