

» CASE STUDY

Wellington Oro, Colorado (US EPA)

PROJECT OBJECTIVES	Remove and recover zinc, cadmium and other trace metals from acid mine drainage to meet strict water quality limits.	
PROJECT SIZE	· 820 m ³ /day flow	
TECHNOLOGY	ChemSulphide® plant	
COST	Confidential	
RESULTS	2009 Operating Results	2010 Operating Results
	· 100,000 m ³ of water treated	· 73,000 m ³ of water treated
	· 28,000 lbs of Zn/Cd recovered	· 25,000 lbs of Zn/Cd recovered



Sulphide precipitation technology delivers lower operating costs by reducing sludge volumes and associated handling and disposal costs by up to 100%.

BioteQ’s sulphide precipitation process has been applied at the Wellington Oro Mine site, a closed silver-zinc mine located near Breckenridge, Colorado. BioteQ provided process design, commissioning, and engineering support for on-going operations. The water treatment plant is successfully treating mine drainage containing cadmium, zinc, and other trace metals, to remove dissolved metals in order to meet strict effluent specifications.



The high-grade metal sulphide recovered from the sulphate precipitation process can be recycled into useful products, eliminating the production of residual waste sludge.

The technology was reviewed and accepted by the US EPA for application at the site. BioteQ’s sulphide precipitation process was selected over lime treatment for the Wellington Oro site because the process meets strict effluent targets and does not generate a waste sludge that would require disposal and ongoing monitoring. An equivalent capacity lime plant would have produced an estimated 390,000 US gallons of metal-laden sludge annually, leaving an environmental liability and adding to long-term operating costs.

Instead, the sulphide precipitation plant produces a saleable zinc-cadmium sulphide product which is sold for recycling into useful products to off-set treatment costs. In addition to delivering operating cost savings, the capital cost of the sulphide precipitation plant for this site was estimated to be approximately 33% less than a lime plant with equivalent capacity, delivering lower life cycle costs.

Table 1: Wellington Oro Water Chemistry

PARAMETER	FEED CHEMISTRY	EFFLUENT TARGETS	ACTUAL RESULTS
pH	6.19	6.5 to 9.0	6.65
Cadmium	0.122 mg/L	0.004 mg/L	< 0.0005 mg/L
Zinc	135 mg/L	0.225 mg/L	< 0.090 mg/L

The plant “...treats mine drainage emanating from a closed silver-zinc mine containing cadmium, zinc and other trace metals, and removes these contaminants to very low concentrations...to meet EPA mandated water quality standards.”

- Dale Stein, P.E.
Assistant Town Engineer
Town of Breckenridge

Figure 1: Wellington Oro Process Flowsheet

