CHILEAN COPPER MINE – CASE STUDY

In late 2013 **newterra** was contracted to design, build and rapidly deploy a modular and pre-manufactured 10 liter per second metals precipitation and solids removal system for a copper mine in Chile.

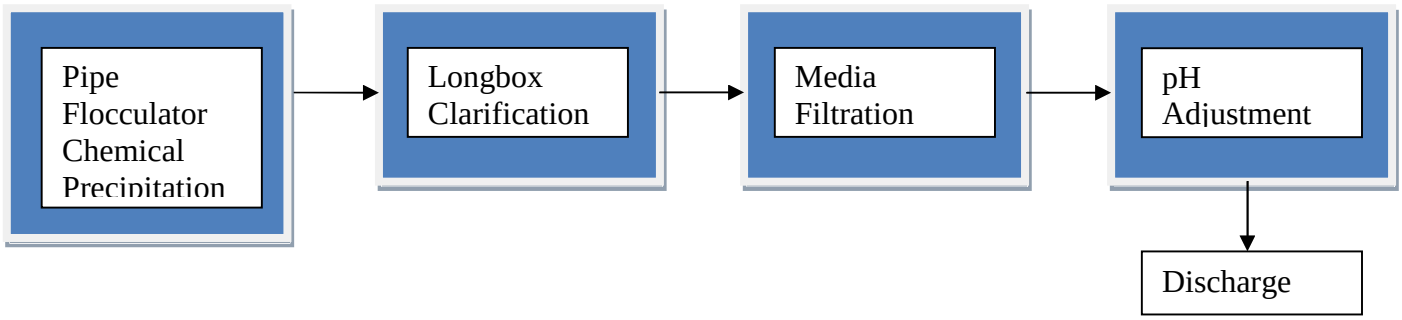
The main contaminants of concern in this application included TSS, copper, manganese, aluminum and pH.

The greatest challenge in this project was meeting the tight schedule constraints imposed by the local regulators. The project was initiated in November of 2103 and all equipment was required to be on site by mid January 2014 to be installed and operating by the end of February.

With no time to lose our customer expedited water sample to our process engineering and bench testing facility located in North America. We simulated the various processes, tested performance, and developed a customized treatment process comprising of chemical precipitation, flocculation, and multimedia filtration which was based on testing results and specific water parameters.

Given the tight schedule, a pilot test prior to deploying a full-scale system was not an option. With this in mind we developed a treatment system with flexibility in mind to allow us to make adjustments on-site to accommodate changing water parameters and system performance.

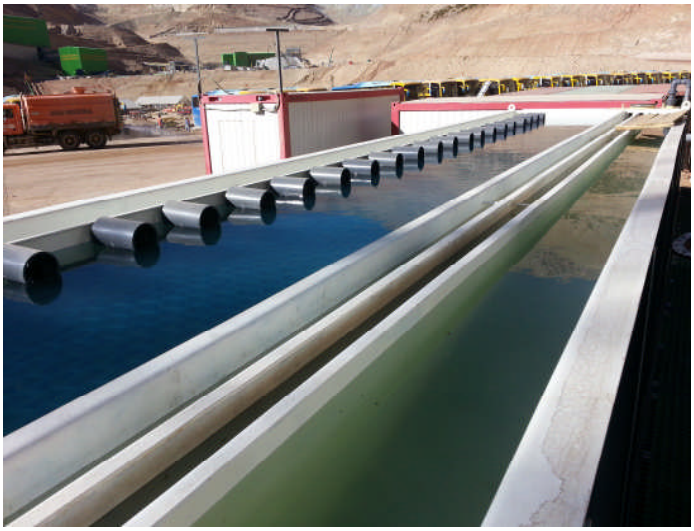
Figure 1. Treatment Process Implemented

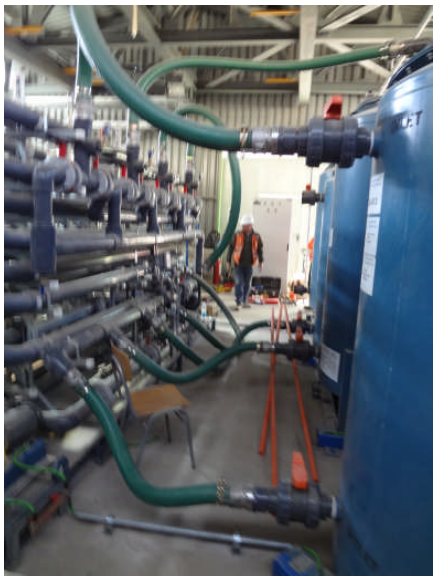


newterra met the schedule by designing a treatment solution utilizing pre-manufactured equipment packages that were already available in our North America based rental fleet. We rapidly modified and shipped the larger components by ocean freight which departed from our factory in early December. We following up with a second air freight shipment at the end of December which included the pre-wired and pre-tested control systems integrated onto the pump skids and pipe flocculator skid all modified to meet Chilean electrical requirements.

With the majority of the piping and electrical work completed and tested in our manufacturing plant, the installation commissioning and startup went smoothly allowing the customer to have a system ready for operation to meet the regulatory requirements.

Figure 2. Site Photos




newterra supported the customer on site though the installation and commissioning phase of the project to ensure a successful startup and continues to work closely with the customer and the changing water parameters on the site to ensure our customer's long term success.

Table 1. System Performance

Parameter	Inlet to Treatment System	Outlet of Treatment System	Discharge Objectives
Total Suspended Solids mg/L	110 mg/L	<1 mg/L	<80 mg/L
Copper	11 mg/L	1.5 mg/L	< 1 mg/L
Manganese	3 mg/L	0.15 mg/L	< 0.3 mg/L
Iron	3.2 mg/L	0.2 mg/L	< 5 mg/L
Aluminum	2 mg/L	0.2 mg/L	< 5 mg/L

Figure 3. Water Quality Photographs

Inlet (left sample), Effluent (middle sample), Sludge in bottom of clarifier (right sample)