

Adsorption Technology Helps Reduce Arsenic at Chilean Drinking Water Facility

Contract awarded to help Aguas Andinas bring arsenic levels into compliance with new national standard

PROJECT

In 2005, Chile's Superintendence of Sanitary Services implemented a new arsenic standard for drinking water, giving the country's water treatment companies 10 years to accomplish it. Many of the companies, which are privately held, sought solutions for their arsenic issues and help coming into compliance with the new standard. Aguas Andinas, the largest water company in Chile with a customer base of more than 20,000 people, was one of them, putting out a solicitation for technology innovators to provide turnkey proposals for its Lo Pinto well site in the Santiago metropolitan area.

At Lo Pinto, the water in the three wells was found to have average arsenic levels ranging from 15 ppb to 21 ppb, well in excess of Chile's new maximum contaminant level. "The arsenic standard in Chile is now the same as in the United States at 10 ppb, but they have a shorter compliance period to bring their wells into compliance. There are a number of similarities to where Chile is today from the U.S. situation in 2001, when the U.S. Environmental Protection Agency (EPA) first promulgated the lower arsenic standard," said Greg Gilles, vice president and principal at AdEdge Water Technologies, LLC.

In 2012, AdEdge began a strategic partnership with Aqualogy Mediamente, which is now part of Suez Environment, to assist Chilean water companies with solutions to these and other water quality issues. Together with the strong local presence of Aqualogy and its own expertise in arsenic treatment, AdEdge was awarded the contract to provide treatment system design, equipment, installation and startup for Aguas Andinas at Lo Pinto.

STATS

Customer: Aguas Andinas

Location: Lo Pinto, Chile

Challenge: Reduce high arsenic levels in three water wells

Flow Rate: 1,900 gpm

Product: Custom-designed seven-vessel treatment system

Results: Since startup in Q1 2015, the arsenic levels in all three wells have been reduced to less than 1 ppb, far below Chile's maximum level of 10 ppb.

For more information on these solutions, visit adedgetech.com.



A seven-vessel parallel flow design by AdEdge Water Technologies, LLC was installed at this site in Lo Pinto, Chile.

CASE STUDY

SOLUTION

A seven-vessel parallel flow design, comprising six vessels in service and one redundant vessel, was designed and deployed with carbon steel construction. At the three wells, the 1,900-gpm system begins by adding chlorine for disinfection and oxidation of the arsenic before the water reaches the treatment facility. Acid also is added to lower the pH from more than 8.0 to around 7.0, and to make the water more optimal for arsenic removal.

The water then passes through an inline mixer and below-grade piping underground. Once it reaches the treatment facility, it splits evenly into the seven skid-mounted filters designed by AdEdge. Within the filters, arsenic is removed using Bayoxide E33 iron oxide adsorption media. After passing through the absorption media, the water exits into a 1-million-gallon atmospheric storage tank, where it is then re-pressurized through additional pumps and moved to Aguas Andinas' customers throughout Santiago.

The treatment system also has an H2Zero automated backwash reclaim that captures the backwash water used to flush out the media and filters, and recycles back to the head of the treatment every 30 to 45 days. This ensures there is no wastewater discharge at the site.

The treatment system was pre-piped, instrumented and tested at AdEdge's Atlanta facility, Gilles said, and flown into the site at Lo Pinto. The system has full programmable logic controls, automated valves and a touch-screen control panel to help operators understand the system's flows, pressures and chemical dosing. Maintenance-wise, aside from checking the system regularly to ensure everything is functioning properly, operators will need to check and replenish chemicals once they are exhausted, and take a water sample to be analyzed on a monthly basis.



Arsenic is removed from the skid-mounted AdEdge filters using iron oxide adsorption media.

Once the adsorption media has been exhausted, AdEdge will provide a service to put in new media and dispose of the existing media. The adsorption media is projected to have a lifespan of between 12 and 18 months.

RESULTS

The system started up in March 2015, and Aguas Andinas is increasing its use of the system on a weekly basis.

"They had an initial low demand, but now that is increasing over time because more wells are being brought online in the system. Some of these wells exhibited an arsenic problem above the standard, requiring treatment while others did not. But they all can operate as an integrated system now," Gilles said.

"The system has worked without any problems and meets Aguas Andinas' expectations," said Simón Vargas of Aqualogy Mediamente. "The system works completely as designed."

Since this treatment was initiated, the arsenic levels in water from all three wells have been reduced to less than 1 ppb—far below the maximum contaminant level. It is one of the first adsorption installations in Chile of this type.