



BYERS, COLORADO

Gains Stable Chlorination and Reduced Maintenance with Constant Chlor® MC5 System

Byers is an unincorporated rural community in Arapahoe County, Colorado, approximately 50 miles east of Denver. Byers Water & Sanitation District provides drinking water to this area. The district operates five wells – each approximately 700 feet deep. Two wells are typically used in the winter and four in the summer. Annual water use averages 140,000 gallons per day for the district's 500 active service connections.

Water is chlorinated using dry Constant Chlor® briquettes made into solution on site and injected prior to distribution. The district had been using a single-pass erosion feed system to generate hypochlorite solution, but this unit became maintenance intensive and problematic.

“We had been struggling to maintain our chlorine residual at the desired level for at least a year,” says Byers Water & Sanitation District Manager Craig White. “Our residual target is 1.0mg/L, but it fluctuated between 0.5 to 1.0 mg/L. We also had to clean out the feed unit quite often due to high calcium buildup, and this buildup would also cut our pump’s diaphragms. We probably had to rebuild our pump six times a year.”

We finally have precise control of our chlorine residual.”

Craig White,
District Manager

The Constant Chlor® feed system has significantly lowered maintenance cycles and maintenance frequency for the district

LONG-TERM PILOT STUDY

Evaluates Performance of New Advanced System

The district participated in a long-term pilot study to determine the performance of the Constant Chlor® MC5 calcium hypochlorite feed system from Sigura. The MC5's recirculating, pressurized erosion system uses EPA and NSF 60 registered Constant Chlor® Briquettes that work in conjunction with the feeder to produce a fresh concentrated liquid chlorine solution on demand.

The recirculation process within the MC5's erosion zone concentrates the solution. Level sensors dictate the recirculation pump's run cycles (which are 30 seconds every 200 seconds) to keep the solution in optimum suspension and stable solution strength. The system can maintain a constant chlorine residual of 0.8 parts per million.



RESIDUAL CONTROL

Becomes Ultra Precise

“The day after the unit was installed, our chlorine residual was right where we wanted it,” White says. “And, if we had done a residual test on the solution being batched, we could have dialed in our pump even faster. After three months of continuous use, the MC5 chlorination system produces a consistent batch concentration of hypochlorite solution, and this has enabled our district to finally maintain precise chlorine residual going out into our distribution system, he says.”

The district had been operating two wells during the initial stages of the MC5 pilot study. “We use two wells in the winter and four in the summer, and all our wells pump relatively the same,” White says. “Once we switch to four in the summer, we shouldn't have any problem turning it up and keeping the chlorine residual right where we want it.”

And, in response to a large water line break, district operators can bring the chlorine dosage up to emergency levels.

“The MC5 unit produces a consistent batch concentration of hypochlorite solution, and this has enabled our district to maintain a precise chlorine residual going out into our distribution system.”

Craig White,
District Manager

REDUCED MAINTENANCE

In The Form of Less Frequent Cleaning Cycles,
Reduced Pump Wear

The water from the district's five wells is highly alkaline (250-300 mg/L) – and high alkaline water can promote scale. White says the district's old single-pass calcium hypochlorite feed system had to be cleaned and flushed every two to three weeks, which took two to three hours each time.

The MC5's advanced erosion technology and Constant Chlor® Plus Briquettes, with their added scale inhibitor, allows the system more run time and far less maintenance.

“We made an initial two week inspection for cleaning, per the manual's operating instructions, and there was next to nothing in there as far as any buildup.” At the one-month inspection, there was more, but not much. White says it takes about an hour to clean the entire unit and all the lines. Once a month cleaning is standard.

The solution strength provided by the MC5 is much stronger than the district's previous single-pass erosion system. The new system supplies a 0.70 percent batch concentration (temperature dependent), compared to around 0.20 percent with the previous unit. The district now pumps far less volume of solution, thereby lowering maintenance cycles, maintenance frequency and extending the lifespan of the feed pump.

The Byers Water & Sanitation District only has a two-person staff, so they especially appreciate the easy-to-operate Constant Chlor® MC5 System.

“PLUG & PLAY” DESIGN

Creates Streamlined Operation

Sigura's team provided startup and training. The easy-to-operate design of the MC5 feed system is an especially important feature for the district because only White and one coworker run the entire operation. Once the feed pump serving the distribution system is set to provide the correct chlorine dosage, it's then basically a matter of ensuring that an adequate supply of dry Constant Chlor® calcium hypochlorite briquettes are maintained in the system's hopper.

Sigura has designed its MC5 feed system to accept an innovative loading attachment to the Constant Chlor® Briquette pails that allows the operator to flip the pail onto the feeder and lock it. This allows for rapid loading of briquettes, while significantly minimizing dust floating in the air while loading the system's hopper. The additional pail locked on top feeds directly into the unit's hopper, providing an additional 50 lbs loading capacity.



RECAPPING

MC5's Advantages For The District

"Installation was pretty simple. We pulled our old calcium hypochlorite feeder out and set this new one in its place. It was a pretty quick and easy change," White says. "The new unit has run really well and is very simple to operate."

The Constant Chlor® MC5 feed system takes up approximately half the footprint of the district's previous system, allowing more room to move in the equipment room, and the unit's top pail loading feature has been a plus, White says.

"We use the feature mostly just to keep the dust down while were pouring. When we used to load the old unit, we were dumping a 50 pound bucket pretty much at face level. And once we did that, dust would come up and become airborne," he says. "We usually would have to leave the room for a few minutes to let it clear out. But now with this new system, we just attach the pail and leave it there, then come back a little while later and remove the empty pail. "

The longer cleaning cycle (monthly cleaning versus two-to-three week cleaning) and the significantly shorter time it takes to clean the MC5 system (one hour versus two-to-three hours) allows White and his coworker Dominic more time to attend to other important duties



on site. And, chronic diaphragm failure in the chlorination feed pump is no longer an issue. The higher concentration of solution can allow the use of a smaller pump and also provides less strain or demand on that pump.

"We switched our feed pump to a peristaltic pump," White says. "This is not something we could cost effectively do while using our old feeder because the high volumes we had to pump."

Ron Clark at Applied Products Group, Sigura's manufacturer representative, headed up the pilot project at the Byers Water & Sanitation District facility. Applied Products and Sigura worked closely with the district in implementing the system.

"Applied Products and I have worked well together a long time, and the people at Sigura have been great to work with," White says.

"It has run really well and is very simple to operate."

Craig White,
District Manager