

Electronic Scale Prevention

City of Las Vegas wastewater recycling facility uses advanced technology to eliminate mineral scale fouling without chemicals or maintenance

In one of its biggest public works projects ever, the city of Las Vegas spent \$37 million to construct the Durango Hills Water Resource Center. This state-of-the-art facility, which started service in 2001, collects municipal sewer wastewater and treats it to standards that make it safe for irrigation of 11 area golf courses.

Designed to meet demand for years to come, the wastewater reclamation plant includes four treatment trains—two on its south side and two on its north side—capable of processing a total of 10 mgd. Current needs are met by operation of two trains, one per side of the facility, with a combined output ranging from 2.5 mgd in the winter, when demand is low, to 6 mgd in the summer when demand is high.

From the start, however, Durango Hills' ultraviolet disinfection system failed to meet staff expectations. This made it necessary to rely on sodium hypochlorite injection to ensure that output to the recycled water distribution system

met safety standards with respect to microorganisms. In turn, this entailed a high cost in time spent by plant mechanics contending with rapid mineral scale fouling of the two operating sodium hypochlorite disinfection systems. From the injectors to the contact basins, these systems include extensive networks of pipeline as well as valves, pumps and other equipment.

Descaling by traditional methods, personnel spent a minimum of eight hours per week on acid washes and on cutting out and replacing blocked sections of pipeline, some of it running beneath concrete.

After two years of this, Durango Hills operations staff met with Ken Matthews, a distributor for ClearWater Enviro Technologies, Inc. to learn about the company's ScaleBlaster electronic descaling device. If the product performed as described to the Durango Hills staff, it would entirely eliminate the maintenance burden, as well as the costs of scale-removing chemicals

and replacement parts for scale-corroded equipment. Staff decided to try the product first on the facility's south side sodium hypochlorite system.

Device recommendation

Matthews recommended the SB-200 descaling device based on the characteristics of the Durango Hills system. These factors included, among others, pipe diameters, pipe composition, and volume and hardness of the flow.

Prior to installation in June 2003, plant mechanics photo-graphed a detached section of the injector's 1-in. outgoing chemical feed line and its adjoining valve to document that both were packed full of rock-sized chunks of calcium carbonate scale.

The SB-200 was installed and activated, as installation of the product is quite simple. Signal coils are wrapped around the relevant incoming pipeline—in the case of Durango Hills, the incoming dilution water line to the sodium hypochlorite injector—and the unit is turned on with the flip of a switch.

Quick results

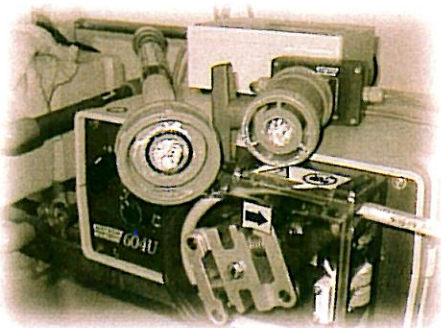
After one month of operation, plant mechanics detached the same section of the chemical feed line as before. Photographs taken at this time revealed that the line was now completely scale-free. Flow rates were now optimal throughout the disinfection system—from the injector to the contact basin—and have remained scale free while scale-related maintenance ceased altogether, according to Durango Hill staff.

Nine months of automatic, maintenance-free descaling on the south side was sufficient to prompt the city of Las Vegas to order a second SB-200 for Durango Hills.

Matthews returned in April 2004 to supervise installation of the unit in the plant's north side sodium hypochlorite system.

After one month of operation, the plant mechanics conducted the same before-and-after inspection as with the south-side system revealing the same results. The north side chemical feed line showed entirely scale-free and, again, flow rates throughout the disinfection system were optimal. Likewise, scale-related maintenance ceased and conditions on the north side of the plant have remained scale free, according to Durango Hill staff. www.cwenviro.com

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