

SCREEN & PROTECT

By Clifford Seth

Separation system
defends WWTP's
MBR addition

Management of a 1.2-million-gal-per-day (mgd) wastewater treatment plant (WWTP) in Star, Idaho, reports successful installation of a solids separation and removal system that protects membranes in its new state-of-the-art membrane bioreactor (MBR) addition. Meanwhile, immediate maintenance benefits have been gained through elimination of aerator plugging in the facility's three lagoons.

Installed in November 2009, the Monster Separation System, which integrates a Bandscreen Monster with a Screenings Washer Monster—both by JWC Environmental, Costa Mesa, Calif.—provides for an initial screening of solids, plus processing of remaining solids (screenings) by grinding, washing, dewatering and compacting.

"The membranes in the new MBR plant are really expensive, and we wanted to be sure to have the best screening ahead of them so we don't get grit or other material that could damage them," said Hank Day, maintenance and operations foreman for Star Sewer and Water District. "We also wanted to filter out as much total solids as we could to keep the new MBR plant running at optimum capacity. This combination solids processing system allowed us to meet both objectives from the outset of the new plant operation. Anytime you are dealing with wastewater, it is a lot easier and cheaper to do it right the first time than to come back and add stuff later."

"Meanwhile, we have already gotten a big benefit with the aerators in our lagoons not plugging up anymore," Day added. "We had been pulling all nine of them for a day, 10 times a year, for cleaning. We haven't had to do that at all since we installed the Monster Separation System."

The WWTP now serves about 2,000 residential customers and another 25

commercial operations. The new MBR plant, featuring Kubota technology, opened in January 2010 as the means for handling a sharp increase in the customer base. Its lagoons were already filled to capacity.

"They are building 20 new subdivisions in our area as we speak," Day said. "To upgrade, we did everything the very best with what we could afford and easily operate. The Idaho Department of Environmental Quality lent us money to build it, and they like what they have seen so far."

How It Flows

At the WWTP's headworks, a manual bar screen removes rags and other large matter. The flow then moves through a separator, which deposits to a 3-yd dumpster.

The remaining wastewater stream then enters the separation system, with 2-mm perforated ultra-high-molecular-weight plastic panel Bandscreen, for removal of solids such as trash and plastics. This is integrated with the screenings washer, which grinds, washes, dewateres and compacts the solids, then discharges them into the grit dumpster.

The effluent from the separation system proceeds through a flowmeter to a splitter box, which sends 20% of the stream to the three 1,600-equivalent-dwelling-unit lagoons, and 80% into the new MBR plant. In the new plant, another splitter box sets up two separate treatment chains, where anoxic and anaerobic cells see mixtures of raw activated sludge, raw influent and mixed liquor from membranes as well as provide biomass "bugs" for the MBRs.

The membrane portion currently consists of 200 flat-plate membranes per cassette and 12 cassettes for each train. Flow in the east and west trains is now about 0.3 mgd each. Allowance has been made for future expansion of

the MBR capacity via more membranes in each train, plus additional trains. The MBR discharges to a chlorine contact basin for final disinfection before the effluent is discharged. Overall, the 1.2-mgd-peak-flow WWTP is operating at about 0.8 mgd.

Evaluations

"The dumpster, which took about a month to fill up with ground material, now gets emptied every two weeks, only because we also fill it with trash. The cleanliness of the discharged solids [from the screenings washer] allow for hauling to a sanitary landfill, which was a compliance criterion that was assured by our engineers, Keller Associates of Meridian, Idaho," Day said.

"We are pleased the MBR plant is operating as designed. The facility is producing great-quality water," said Justin Walker, project engineer for Keller Associates.

"We wanted to make sure organics were removed to reduce odor and ensure waste would be accepted at the landfill," said Randy Zollinger, project manager for Keller Associates. "During our initial startup, we saw our decision to utilize the screenings washer was justified, as very little odor was generated from the washed compacted screenings."

"The unit has been working fine. We check it daily for cleanliness and neatness, and that is all we have had to do," Day said. "In considering alternatives, we had originally settled on a Bandscreen versus a

step screen because it would let in less solids, and then specified a 2-mm size to meet the MBR manufacturer's warranty. We then selected the JWC system, as it is easiest to operate and maintain. For example, it didn't have any bearings down in the waterway, and you could take out sections of the belt without taking out all of it, which requires disassembling the whole unit." **MT**

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