



MSS-Star, ID

PROBLEM: Protecting an expensive new Membrane Bioreactor

SOLUTION: Monster Separation System

CONSULTANT: Keller Associates

Hank Day (r), Maintenance and Operations Foreman and Kyle Woodland (l), Assistant Plant Operator of Star Sewer and Water District.

Monster Solutions

Separation System Protects New MBR Addition for WWTP

Star, ID – Management of a 1.2 mgd (189 m³/h) wastewater treatment plant (WWTP) here reports successful installation of a solids separation and removal system which protect 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 its three lagoons.

Installed last November, the Monster Separation System™, which integrates a Bandscreen Monster™ with a Screenings Washer Monster® provides for an initial screening of solids, plus processing of remaining solids (screenings) by grinding, washing, dewatering, and compacting. The unit was designed and manufactured by JWC Environmental in Costa Mesa, CA.

“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,” explained 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’re dealing with wastewater, it’s a lot easier and cheaper to do it right the first time than to come back and add stuff later.”

“Meanwhile, we’ve already gotten a big benefit with the aerators in our lagoons not plugging up anymore. We had been pulling all nine of them for a day, ten 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, featur-

ing state-of-the-art Kubota® technology, opened last January as the means for handling a dramatic continuing increase in the customer base. Their lagoons were already filled to capacity.

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. (2.3 m³) dumpster.

The remaining wastewater stream then enters the Monster Separation System (MSS), with 2 mm perforated ultra-high molecular weight plastic panels Bandscreen for removal of solids such as trash and plastics, integrated with a Screenings Washer Monster (SWM), which grinds, washes, dewateres, and compacts the solids and discharges them into the grit dumpster.

The effluent from the MSS proceeds through a flow meter to a splitter box, which sends 20% of the stream to the three 1600 equivalent dwelling unit (edu) 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



The Bandscreen Monster, installed in November 2005 as part of the JWC Monster Separation System.



raw activated sludge (RAS), raw influent, and mixed liquor from membranes, and provide biomass "bugs" for the MBRs.

The membrane portion currently consists of 200 flat plate membranes per cassette, and twelve cassettes for each train. Flow in the east and west trains is now about 0.3 mgd (47 m³/h) each. Allowance has been made for future expansion of the MBR capacity via more membranes in each train, and additional trains.

The MBR discharges to a chlorine contact basin, for final disinfection before the effluent is discharged. Overall, the 1.2 mgd (189 m³/h) peak flow WWTP is presently operating at about 0.8 mgd (126 m³/h).

"They're building 20 new subdivisions in our area as we speak," continued Day. "To upgrade, we did everything at the very best we could afford and still be easy to operate.

The Idaho Dept. of Environmental Quality lent us money to build it, and they like what they've seen so far.

"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 SWM) allow for hauling to a sanitary landfill, which was a compliance criterion that was assured by our engineers, Keller Associates of Meridian, ID."

As Justin Walker, project engineer for Keller Associates points out, "We're pleased the MBR plant is operating as designed. The facility is producing great quality water."

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

"The JWC unit has been working fine. We check it daily, along with the rest of the plant, for cleanliness and neatness, and that's all we've had to do," Day adds.

"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 Monster Separation 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 (Bandscreen) without taking out all of it, which requires disassembling the whole unit."

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Photo courtesy of Coble Sampson Associates, Inc.

Star Idaho's new MBR plant opened January 2006 and now serves over 2,000 residential and commercial customers.



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