Pictured left to right: Dan Commons, Water Reclamation Facility Administrator, and Layton Brown, Maintenance Supervisor

Huber's Center Feed Drum Screen is Mission Critical to North Las Vegas MBR Plant.

"These screens are one of the most critical technologies in our plant."
Layton Brown, Maintenance Supervisor

The City of North Las Vegas's field facility is a membrane bioreactor (MBR) plant that was brand new when Huber's rotary fine screens were implemented as part of its new water treatment and reclamation process. The facility is "smart," using a level of technology at which few large plants operate and employing sophisticated security that even includes a laser perimeter. The technology enables 24-7 processing with 14 of its operational hours every day unmanned on site. Huber's advanced fine screening technology plays a key role in this impressive and innovative technology line-up.

During the planning process, the City of North Las Vegas was advised by GE Water to include fine screens in their MBR plant design. The supplier of the bioreactor's membrane recommended Huber's center-feed drum screen as the best technology to prevent wash around that can ruin the membrane bioreactor.

North Las Vegas has installed some of the largest rotary fine screens operating in the U.S. Each Huber Technology RPPS center feed drum screen measure 8.5 feet in diameter and is mounted in 10 foot wide channels. The plant alternates the four such screens in processing an average flow of more than 8.5 million gallons per day. The center feed drum screens are critical to protecting the membrane bioreactor, enabling the plant to maintain extremely low turbidity coming off their plant that is better than most potable water.

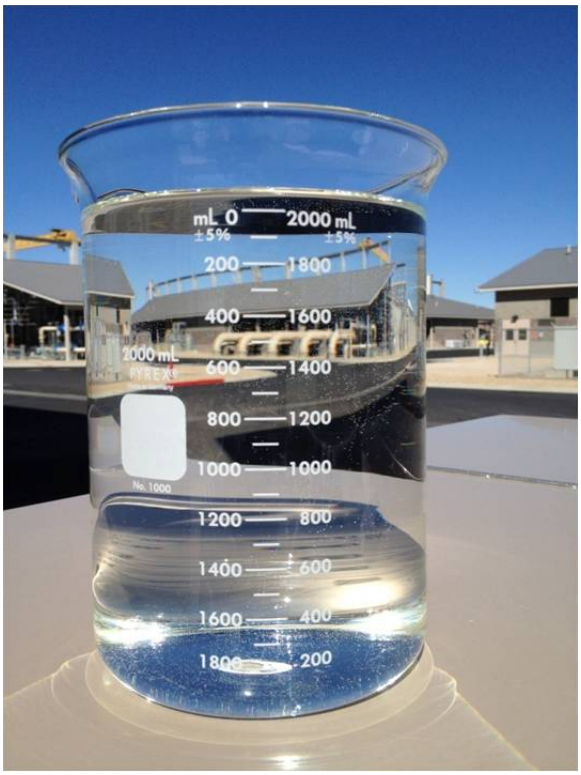
Proven fine screen is critical to process

As noted above, North Las Vegas's MBR plant is capable of producing high quality permeate. This is possible because of the coordinated components that it operates. A coarse screen and two chambers at the headworks separate many large solids from North Las Vegas' flow before it reaches Huber's Rotamat® RPPS center feed drum screens. Removing the large solids allows the Huber screens to work at their most productive capacity to prevent hair from reaching the reactor membrane. The fine screen protection is critical to:

- **Smooth operation of the bioreactor**
- **High quality of permeate produced**
- **Protection of the membrane**

Dan Commons, Water Reclamation Facility Administrator, and Layton Brown, Maintenance Supervisor, are proud of their plant.

"We depend on the Huber fine screens as the final layer that can keep damaging hair strings from reaching the membrane strands," notes Brown. "These screens are one of the most critical technologies in our plant."



"We consistently produce permeate that is an order of magnitude cleaner than what most cities have for drinking water," notes Commons. "Our permeate is consistently selected as the cleaner choice even when compared with bottled water in demonstrations for tour groups that visit our plant."

While some other MBR plants have implemented screens with 3mm openings, North Las Vegas took their screen requirements down to 2mm openings. By using the Huber Rotamat® RPPS strategically within their process, the plant has a true layer of protection as the flow moves through a final chamber and to the membrane area.

Lack of protection has dire consequences

If hair strings reach the bioreactor membrane, they can wrap around and then cause build-up

on individual membrane strands. This can result in obstruction of the flow around the membrane or breakage of the individual membrane strands. Obstruction or damage to a single strand would not be a significant issue. However, because build-up in this situation would be continuous, many strands would become damaged and create a combined impact that would jeopardize the water quality and require expensive repair processes.

"Since there are 3,900 membrane strands in each cassette, it doesn't seem that damaging or breaking one would matter. However, hair build-up produces a snowball effect on the strands and can quickly escalate to very expensive and damaging levels," adds Commons. "Cassettes are about ¼ million each to replace and we would take a $15 million hit if we had to replace all of our membrane strands, so we're very protective of them."

Hair is a big deal within a water reclamation plant's flow. While each strand is tiny, many can become tangled to create hair masses of monstrous proportions. Commons' previous plant experience gave him opportunity to witness a tangled hair mass measuring 20-30 feet in length and 6 feet in diameter moving within the flow. With that type of potential, it is clear to see why treatment strategies that employ proven fine screen technology are implemented *and* why Huber's Rotamat RPPS® is high priority equipment at the North Las Vegas plant. Huber's Rotamat RPPS® provides insurance for Commons and Brown that such a monstrous hair mass would never reach their bioreactor membrane.

Simple, durable and self-cleaning

To Commons and Brown, Huber's technology stands out because its design is simple which makes it easy to maintain and operate. The self-cleaning of the screen is accomplished through simple physics: when the flow reaches the a set differential level the screen rotates to clean itself off. If this process doesn't take place within a set time parameter, the self-clean process is started automatically.

"The design uses the backwash to clean the screen out. It runs on the differential of the water on the up and down sides of the screen. When the elevation is right, it flips to clean. We make a couple of precautionary checks each month and clean

everything off with fire hoses. But we rarely find an issue," remarks Brown. "We occasionally find solids to remove – and sometimes they are worth keeping. We even have the first dollar bill that we found in the screen framed in our office."

Huber's Rotamat RPPS® is completely fabricated of stainless steel with the exception of the polyurethane drum seal that prevents captured screenings from escaping the screen. In addition the covers provide a barrier that prevents corrosive gasses and permeating the flow.

"The screen is an absolute barrier between (corrosive) gasses and the flow – because of the seals and gaskets. This plant has been up and running for more than 2½ years and we've not had to change them yet," shares Brown. "That really speaks to durability because the gasses that come off the sewer will eat right through metal."

Teaching them to fish

The old proverb "Give a man a fish and you feed him for a day; teach a man to fish and you feed him for a lifetime" is applicable to Huber's service team. The North Las Vegas plant's design implemented some industry innovations.

Experience with these new technologies wasn't a given among the plant operations teams. Huber's service and support teams provided comprehensive training that included tips on early recognition of issues and ways to reduce maintenance and repair costs. The North Las Vegas team was eager to learn from the Huber service team and became adept at good maintenance procedures. This is exactly what Huber intended since the service team's mantra is to share its knowledge so that clients can take good care of their equipment and perform preventative maintenance.

"Huber's folks even gave us 'what happens if you don't' scenarios that helped us to drive home the importance of maintenance to the entire team and to the plant. The Huber component is vital to our plant and we take great pains to do what they recommend between the visits provided by their Maintenance Contract" says Commons.