

CLEAR H₂O FOR THE HIPPOS

If you know anything about hippos, you probably know they poop a lot. Keeping that poop out of the new hippo habitat at the Milwaukee County Zoo is complicated stuff. So complicated, in fact, that the Johnson Controls Water Conservation System occupies 7,500 square feet in the basement of the former elephant building and requires its own staff member to monitor it.

Erik Carlson's official title is "life support technician." "The focus of my position is to ensure that the water quality of the hippo exhibit remains optimal for the hippos and for the public's viewing pleasure," he says. That means maintaining the filters and ozone equipment and troubleshooting any problems that arise. He also maintains the ozone equipment for the otter habitat and the Pacific Ocean and Lake Wisconsin exhibits in the Aquatic & Reptile Center.

Because hippos create so much waste, the water would become cloudy and dirty within a day or two without filtration, Carlson says. In the old habitat, the Zoo drained the pool and refilled it each day. The new system allows the same water to be cycled through the exhibit all year long, saving millions of gallons of water per year. The water in the hippo habitat turns over three times an hour.

The ozone system is key. Ozone breaks down organic molecules, including compounds that discolor the water and cause odor. It also disinfects and kills bacteria and viruses that could harm the hippos. "This filtration system would allow us to house multiple hippos in the same exhibit, while keeping the water clear and the hippos healthy," Carlson says.

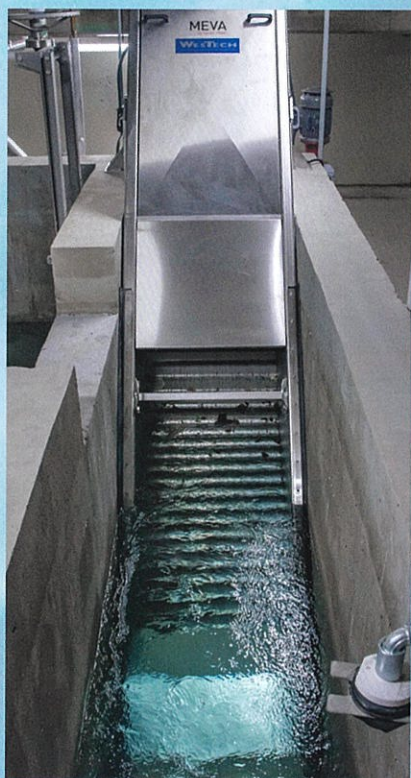
HIPPO WATER FILTRATION

1 The dirty water leaves the outdoor habitat and passes through the two monoscreen filters, which help separate the large solids (hay and debris that blow into the exhibit) from the water. The water then is pulled into the three main pumps.

2 The water is forced by the pumps through five large sand filters. The sand filters collect suspended solids in the water. This includes small debris like algae, small pieces of hay and other material that makes it through the monoscreens.

3 The water goes through a disinfection process by ozone. Ozone is used to disinfect and kill harmful bacteria and viruses that could accumulate in the outdoor exhibit if left untreated.

4 The water passes through the degas tower to draw out the ozone, and then flows back into the outdoor exhibit. The entire process through the habitat and filtration system takes 35-40 minutes.



Monoscreen filters remove larger solids from the water returning to the pump from the outdoor exhibit.



▲ The system includes five sand filters that remove fine solids from the recirculating water.



A press squeezes the water out of the waste to allow for the removal of a lighter product.



▲ The three main pumps push the water at a rate of approximately 2,640 gallons a minute.



The jet pumps are set on a timer to turn on and scour the bottom of the outdoor exhibit to remove debris.

All photos by Joel Miller