



1

1. The AquaPrime filtration system uses a pile cloth filter media.
2. The technology can remove solids without using chemicals. The filtered water can be disinfected and discharged or blended back with the plant effluent.



Front-End Solution

A NEW CLOTH-MEDIA FILTER DESIGNED FOR PRIMARY TREATMENT AND WET WEATHER FLOW HANDLES HIGH SOLIDS LOADING RATES IN A COMPACT FOOTPRINT

By Ted J. Rulseh

Clean-water plants are constantly challenged to improve efficiency and meet increasingly strict permit limits. When new regulations or community growth demand plant expansion, space can be at a premium, especially for older facilities hemmed in by surrounding development.

Cloth-media filtration has been used for years in tertiary treatment; now an industry supplier is offering the technology as a front-end solution, for primary treatment as well as for handling high wet weather flows.

Aqua-Aerobic Systems says its AquaPrime cloth-media filtration system can perform reliable primary treatment in a fraction of the footprint of conventional primary settling basins, while also reducing load on biological treatment and potentially helping increase production of biogas that can be recovered as an energy source.

The company says the system uses well-proven filtration with its OptiFiber cloth media to filter screened, de-gritted wastewater. John Dyson, product channel manager, explained the technology in an interview with *Treatment Plant Operator*.

tpo: What market needs drove development of this offering?

Dyson: First, some facilities face footprint constraints. They are landlocked yet need more treatment capacity, and primary clarifiers are gener-

ally quite large. Second, enhanced primary treatment benefits the secondary process — there are savings on energy or the secondary process can get smaller. Third, more facilities are looking to turn biogas into energy, and solids removed in the primary phase have much greater potential to produce biogas in anaerobic digestion.

tpo: How does this method of filtration apply to wet weather flows?

Dyson: In wet weather flows, the solids after the initial flush are generally low in concentration. The beauty of this technology is that in most cases, those solids can be removed without using any chemicals, and the water

can be either discharged after disinfection or blended back with the plant effluent. It can be deployed not only at the treatment plant but also remotely, for combined sewer or sanitary sewer overflows or to treat storm runoff.

tpo: Can this technology also be used for tertiary treatment?

Dyson: It can be designed so that in dry weather conditions it does tertiary filtration, and in wet weather it can convert over to handle the excess flow while the treatment plant still runs at its baseline design flow.

“ Although the technology is new for primary and wet weather applications, the actual mechanics are proven through more than 1,500 cloth-media filter installations. This is really the reapplying of an existing technology to a new application.”

JOHN DYSON

tpo: How is this cloth filter able to function in a primary treatment application?

Dyson: The base concept is our proven tertiary filter with a pile cloth media. In that design, there is a little bit of solids settling and then filtration through the media. In the case of primary and wet weather treatment, we have more developed solids removal. We allow heavy material to settle by using a hopper bottom design. We also include a weir to collect the floatables. So combined with filtration, we have three modes of removing solids to provide a total solution. The filter captures close to 90 percent of the solids.

tpo: Does the process in primary applications require any special backwashing method?

Dyson: Due to the design of the system and the nature of the application, the solids mat on the surface of the media. Our normal design backwash is extremely efficient in achieving the cleaning that's required. We backwash by pulling solids off the media using a backwash shoe. The shoe makes contact with the cloth and as the disc rotates, the backwash system basically vacuums the solids off the media.

tpo: How has this been tested and proven before being offered commercially?

Dyson: We've done more than 3 1/2 years of research, including long-term studies in California on the primary application. We have a research and development facility here at our headquarters in Rockford, Illinois, where we have tested the technology multiple times, and we've done several strategic pilot studies across the country on wet weather and primary applications at customer sites. So we have thousands of hours of operation on the system, and we continue to do testing. One customer in California has purchased a unit for a 1 mgd full-scale pilot study, where we are testing it on primary treatment, in parallel with an existing treatment train with conventional primary clarifiers and the same secondary biological treatment process.

tpo: Is there any particular sweet spot for this technology in terms of size?

Dyson: It is suitable for flows from 1 mgd to tens of millions of gallons per day, depending on the application. There is really no constraint on size.

tpo: What has been the market's response to the technology so far?

Dyson: Customers have been very much impressed with the technology; we've seen a lot of interest. We have a decent pipeline of projects already in place, and all of our pilot units are booked up almost for the next 12 months.

tpo: How would you sum up the difference between this system and your company's established cloth-media filtration offerings?

Dyson: Although the technology is new for primary and wet weather applications, the actual mechanics are proven through more than 1,500 cloth-

media filter installations. This is really the reapplying of an existing technology to a new application. The difference is that the hopper bottom is a little bit larger, and we have a way to remove floatables, but the mechanics of how it backwashes and how it operates, such as the drives and mechanical systems, have all been full proven out in many years of operation.

Utilities need more enhanced primary treatment that provides benefits throughout the treatment plant. The ability to handle wet weather conditions at the treatment plant or remotely, without chemicals, is an advantage.

And the fact it can be used in some cases in dual applications for tertiary and wet weather treatment is an additional benefit. **tpo**