

Treating Wastewater to Drink and Drive!

By Dr. Marcus N Allhands

In the US Midwest Municipality, wastewater is being treated and recycled to save enough potable water to supply 7,000 homes and to manufacture biofuel to run cars.

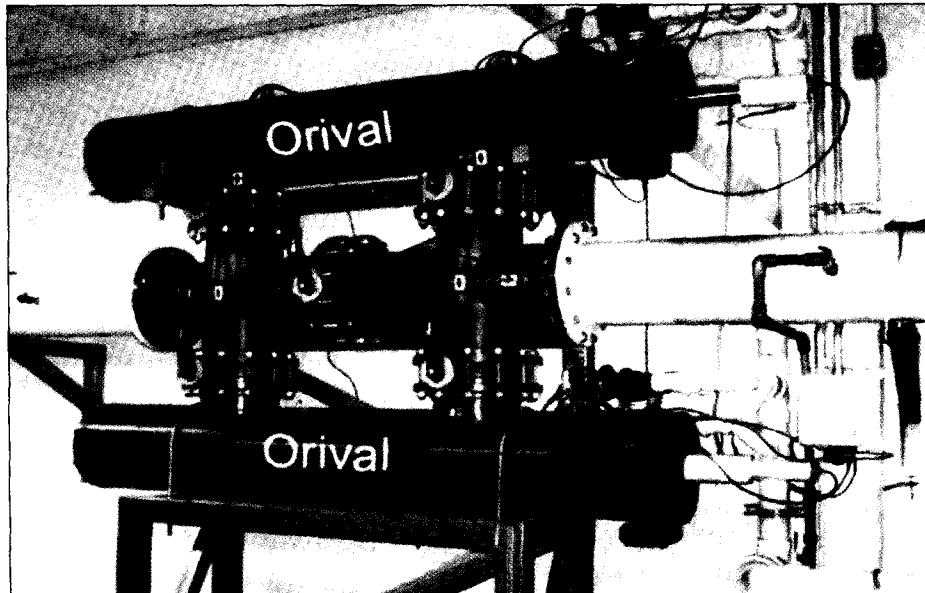


Figure 1: Filtration system: two Orival OR-12-PS filters with manifold

Municipalities and city communities are fast supplementing their natural water sources with treated wastewater to ensure adequate supply and conservation of potable water. Manufacturing processes for various industrial applications require large quantities of water; but the availability of limited resources demands conservation. In this present scenario the treatment and reuse of wastewater has proved to be a boon for America's Midwest municipality and the Iowa community to meet their water requirements.

Onsite wastewater reuse: Case study I

Midwest Municipality recycles wastewater to provide sufficient quantity of potable water. The 100MGD wastewater treatment plant located along the banks of one of

the largest tributaries to the Mississippi River has a large demand for service water with low suspended solids. Nearly 3MGD of water is needed for cleaning devices on the bar screens, spray water to keep the belt presses clean and porous, pump seal water, service water at hose stations and water to cool several large V-12 engine/generator sets that run off of methane gas generated from sludge digestion. Typically, wastewater treatment plants take this service water from potable water supplies. An automatic self-cleaning screen filtration system was installed recently using effluent from the plant for all of these non-potable needs saving enough potable water each day to supply over 7,000 residents in the area. Figure 1 shows the operating installation. The controls initiate a cleaning cycle when a 7psi loss across the filtration system is reached due to captured

debris or based on a manually set timer. During the cleaning cycle a dime-size area of screen is forcefully cleaned by pulling water backward through the screen at a velocity of over 50 feet per second and then moving that dime-size area of cleaning action across every square inch of screen surface. Each filter takes less than 15 seconds to clean without interrupting the filtration process. Simplicity, dependability, performance and the manufacturer's commitment to customer service drove the selection process by the engineering firm commissioned to design the reuse system.

Wastewater helps run your car: Case study II

The residents in a small Iowa community are proud to do their share in diminishing America's dependence on foreign oil. This

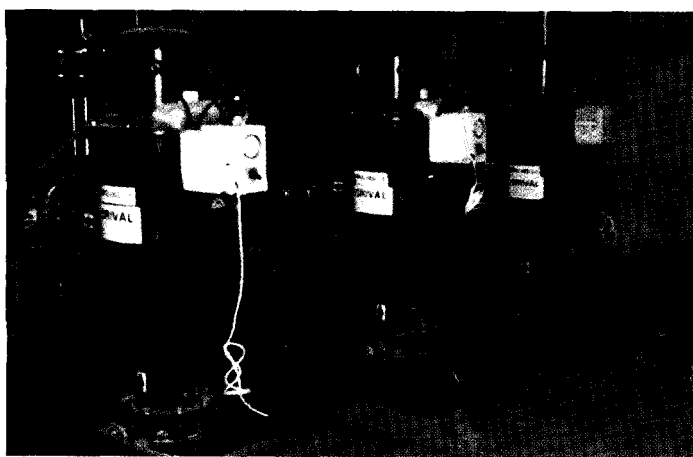


Figure 2: Orival ORG-060-LS membrane pre-treatment filters

was done by building a plant to convert corn grain to 110mn gallons of fuel grade ethanol each year. This facility will supply over a quarter of a million US cars with E85 fuel. However, all is not rosy in the 'renewable city'. Each gallon of ethanol produced requires nearly three gallons of water. Two-thirds of this necessary water comes from a local water supply reservoir. The other third is discharged as effluent from the municipal wastewater treatment plant and the water flushed is helping cars run. Both water sources must be pumped six miles to the ethanol plant. To provide the necessary water quality, a water treatment plant was installed onsite. It consists of automatic self-cleaning screen filters to remove algae, sand, silt, rust flakes, pipe scale and other debris from the raw water supply before heading to a hollow fibre UF membrane system. The membranes remove all bacteria, most viruses and other microscopic debris. If it were not for the pre-treatment filters, the membranes would plug and efficiency would be poor. The automatic self-cleaning screen filters used for pre-treatment are shown in Figure 2. The filters clean themselves according to time or when a 7psi loss occurs across the filters, without interrupting the filtration process. Flow is always supplied to the UF membranes, without redundant pre-filter units. By backwashing a dime-size area of the screen with a velocity of over 50 feet per second, all debris is pulled from the screen in that area. Next, that dime-size area is moved across every square inch of screen surface to clean the screen 100% every time. The entire cleaning process takes less than 15 seconds and uses only a few gallons of water in the process; thus conserving a precious resource. The selection of the pre-treatment equipment is based upon simplicity, dependability, performance and the manufacturer's commitment to customer service.

About the Author

Dr. Marcus Allhands has specialised in water quality for over twenty years with the last twelve years devoted to filtration technologies. He is currently the Vice President-Business Development, Orival Inc.

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