By Patricia Els

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Increasing water supply, reducing environmental impact

Wastewater can be used in a variety of industries to reduce demand on a strained water supply.

In addition to our planet becoming warmer and drier, experts believe it is the mismanagement of our water supply that is impacting the supply and demand imbalance facing our communities. According to the Water Resources Group, an arm of the World Bank, water demand is expected to exceed current supply by 40 percent by 2030. That is less than 20 years from now.

This increasing demand for water resources has municipal and industry leaders across the U.S. taking a serious look at sustainability initiatives, including reusing wastewater. Statistics issued by the National Academy of Sciences (2012) help shine a spotlight on the power of reusing water. The study states the U.S. would increase its water supply by 27 percent if all the wastewater currently dumped into our waterways was recycled. That would amount to 12 billion gallons of reusable water.

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In an effort to help reduce the demand on freshwater supplies, the ability to use recycled water is catching on. For circumstances where potable water is not required, why not substitute reclaimed or recycled water? Many industrial processes use massive amounts of water. For example, it takes approximately 270 gallons of water to produce one dollar worth of sugar, 200 gallons of water to manufacture one dollar worth of pet food and 140 gallons of water to produce one dollar worth of milk.

To date, industries have made some progress to reuse water resources. Within the past 15 years, approximately one billion gallons per day of treated wastewater has been reclaimed to meet non-potable water needs, such as irrigation of golf courses and public parks (Center for Sustainable Systems, University of Michigan from a U.S. Geological Survey).

While this trend is growing, companies today are realizing that as water resources become scarcer, wasteful production methods do present business risk, particularly if surcharges on water usage by local governments are common.

Wise water management

The ability to reuse water does offer both environmental and cost savings benefits. But, how would it work and which companies could use it?

Some applications for recycled and reclaimed wastewater include Department of Transportation (DOT) maintenance work such as plant irrigation, construction site and concrete usage, to name a few.

For construction and concrete companies, reclaimed water can be a viable option to reduce water withdrawal on municipal water supplies. Typically, concrete companies need 80-100 gallons of water per 10 cubic yards of concrete. A 30x50 foot residential foundation would require between six and eight trucks of concrete and 600 gallons of water.

In the New York region, permits allow water to be taken from fire hydrants on the job site, leaving taxpayers to foot the bill. Alternatively, the water can also be extracted from private wells with additional demand on natural resources.

Benefits of Wastewater Recycling

- Helps preserve fresh water supply
- Reduces environmental impact of industrial processes
- Cost savings.

Applicable Industries

- Construction sites (dust control)
- Concrete
- Department of Transportation (DOT) maintenance
- Irrigation of commercial properties (golf courses).

Reclaimed water sources and opportunities

Throughout the country, there are many sources of industrial wastewater that can be treated and then recycled. Some examples include water from vehicle washes, groundwater, pharmaceutical and food processing and petroleum-impacted sites. For petroleum-impacted water, key sites within communities where wastewater can be collected include petroleum stations, abandoned tanks or residential oil tanks, in addition to oil water separators and manholes.

With excessive rain amounts, petroleum storage tanks can become flooded. The extracted water can then be treated to remove all petroleum-related contaminants such as benzene and phenols, among others, for reuse.

While recycling is the ultimate goal, the water treatment equipment and processes are also advancing to treat wastewater to meet a diverse range of discharge and recycle requirements. Industry experts expect water treatment to be top of mind for industry, as well as for consumers. In fact, concerns from consumers about a range of contaminants within water are listed as factors driving water treatment growth in a research report by RnRMarketResearch.com.

The study estimates that the U.S. water treatment equipment market will be worth $13 billion by 2017. Specifically, the expected market growth is due to increasing concern about health and the environment in the face of biological contaminants, chemicals and disinfection byproducts in supply water, the release reported.

According to the study, the fastest growing markets are expected to be resource extraction, commercial and residential and ballast water treatment. Moreover, green technology, such as electrocoagulation, is gaining acceptance as an effective way to treat wastewater on-site or at treatment plants by using electricity, not chemicals.

Reclaimed wastewater: A petroleum case study

Petroleum-impacted water is brought into a treatment facility. The water is separated from the petroleum and, as part of the recycling, the petroleum is sold off to a refinery to reuse/recycle. The remaining water then goes through a series of processes, including air stripping, chemical reactions and filter pressing, to remove contaminants. Once complete, the water is tested to confirm compliance with all discharge requirements.

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Currently, in most situations, this water is then discharged into the sewer system. One vision for wastewater recycling would transfer the treated water to a waiting truck. That truck would then travel to multiple locations to provide recycled water for industrial usage including compost facilities, concrete companies to fill their water holding tanks for use on local construction projects and to water spray the plants on local highways.

Takes a community effort

Along with recycling, there are community initiatives to reduce or divert overall wastewater flows. An increasing number of municipalities, commercial and residential professionals are looking to implement eco-friendly solutions to help conserve water.

For example, toilets, showers and faucets represent a combined 60 percent of all indoor water use. By installing high-efficiency flush toilets, composting toilets, faucet aerators and rain barrels, an approximate 10 percent reduction in household water use can be attained. Moreover, gray water from kitchen sinks, tubs and clothes washers can be used for home gardening, lawn maintenance, landscaping and other uses.

The impact of larger scale usage of reclaimed and recycled water would continue to positively impact the environment and help solve the water demand deficits within our communities. Moreover, water conservation programs that include using reclaimed water can help us transition from wasteful processes to more water-conserving production methods.

As John Sawhill, president and CEO of the Nature Conservatory, once said, "A society is defined not only by what it creates, but by what it refuses to destroy." **WT**

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