

By Wayne Morgan

Reuse on the rise

More than 2 billion gal of water reused daily in various U.S. applications

Meeting water demand and supplying water for future generations is a significant challenge for the water industry. Although water scarcity is an issue of critical importance in drier areas, communities across the nation are increasingly experiencing water shortages, calling into question the longevity of a national water supply that is threatened by droughts, consumption patterns and continued population growth. By the year 2015, it is estimated that 36 states will face serious water shortages, and water demand is expected to soon outpace water supply in mega-cities like Los Angeles. Water reuse offers an essential, viable and drought-proof solution for managing our critically limited natural resources.

ARTICLE SUMMARY

Challenge: Population growth and water availability have made it difficult for many utilities, municipalities and private companies to meet current and future water needs.

Solution: Nonpotable and indirect water reuse, as implemented on a variety of American Water projects for instance, is growing at a rate of approximately 15% annually.

Conclusion: Moving forward, more groups will look to financing water reuse for cost-effective, environmentally friendly and safe water resource management.

Applications & Treatment

The water cycle is a natural process that recycles water, but with advancements in treatment technologies, water can now be recycled more efficiently to meet our needs. Water reuse is a term describing the reclamation, treatment and recycling of wastewater or storm water collected from homes, commercial buildings and industrial facilities. Reused water is not used for drinking, which accounts for only 1% of overall consumption. As such, tremendous opportunity lies in reusing water for a variety of other nonpotable purposes.

Water is reused in two main ways: nonpotable reuse, which involves taking treated wastewater to

use for agriculture and landscape irrigation, industrial use (such as cooling processes), toilet flushing and fire protection; and indirect reuse, which involves using wastewater to recharge groundwater supplies. Indirect reuse, also called land application, allows treated wastewater to percolate down to aquifers to replenish water sources. Nonpotable reuse is already a widely accepted practice that will continue to grow, and indirect potable reuse is becoming an increasingly favored and applied method of reuse over discharging water into surface water, which ultimately evaporates or runs off into the ocean.

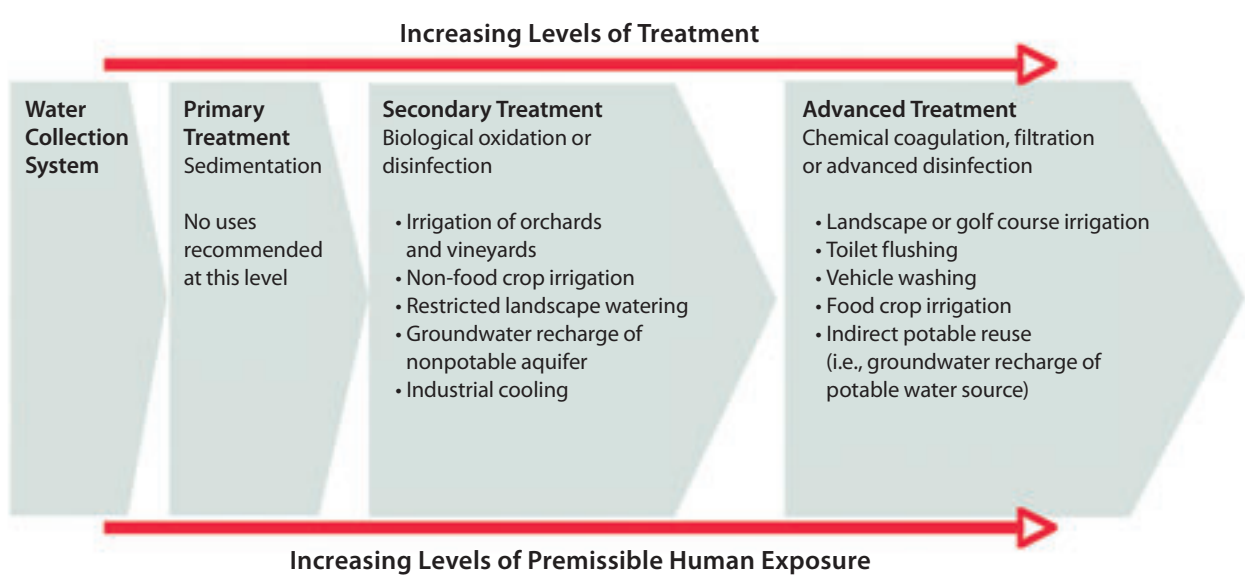
Because the vast majority of water goes toward industrial use or irrigation, using wastewater as an alternative supply for such applications can help protect existing supplies. Water reuse also helps the environment by decreasing the amount of wastewater discharged into bodies of water, which has long been considered a pollutant and problem, and by beneficially utilizing the nutrients in the discharge as fertilizers in irrigation applications. Water reuse can also be an economical long-term water management solution, as treating water to nonpotable versus potable standards is energy-efficient and precludes the need to purchase from or draw on new water sources.

Table 1 shows how reused water is subject to differing levels of treatment and quality criteria, as determined by its end use. As a means of ensuring public safety, water that is more likely to come into contact with human beings is subjected to further treatment and more stringent standards.

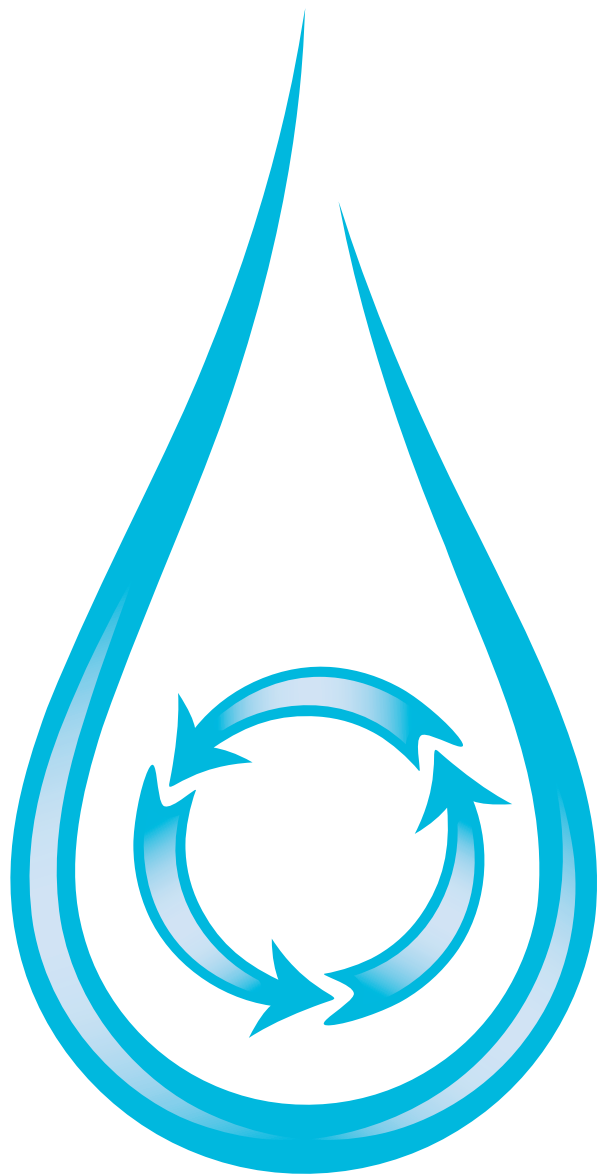
Technology in Practice

Water reuse in the U.S. is a growing practice, with more than 2 billion gal per day (gpd) reused, and reused water volume is growing at an estimated 15% per year. With so many communities experiencing a reduction in water supply, wastewater reuse is increasingly being explored to meet water demand in

Table: Suggested Water Recycling Treatment & Uses*



*Suggested uses are based on Guidelines for Water Reuse, as developed by the U.S. EPA



an environmentally friendly as well as economically feasible way. Utilities, municipalities and the industrial private sector are now, more than ever, seeking ways to implement such solutions as a way to reserve water resources and meet demand. Additional drivers of putting water reuse systems in place include: alleviating stress on our nation's water infrastructure by reducing water volumes; implementing water reuse systems while repairing or updating pipes and facilities; regulatory mandates and incentives, such as water rate and tax subsidies; and shifting expectations toward sustainability.

Recycling nearly 2 billion gal of water annually, American Water's Applied Water Management Group has a long history of designing, implementing and operating water reuse systems across the U.S. Notable projects include:

Residential buildings. The Solaire and Tribeca Green buildings in Battery Park City, New York City, employ an underground double piping system to recycle and deliver wastewater for a variety of purposes, including toilet flushing, air conditioning and irrigation of roof gardens and an adjacent park. By reusing wastewater for nonpotable applications, Tribeca Green's potable water needs are reduced by nearly half.

Community developments. The Homestead at Mansfield in New Jersey is an active adult residential development connected to a dedicated wastewater treatment plant. The water reuse system provides up to 250,000 gpd of reclaimed water to irrigate landscaped spaces at personal residences and open common areas.

Sports facilities. Gillette Stadium, the home of the New England Patriots, would not have been in Foxboro, Mass., a town with limited water supplies, had it not been for the stadium's water reuse system. The facility's double piping system treats recycled wastewater from the stadium, as well as from adjacent office complexes and stores, saving 250,000 gal of water for every major event.

Commercial complexes. Wrentham Mall has undertaken the first commercial water reuse project in Massachusetts. Facing space and environmental constraints for wastewater discharge, an onsite water

recycling and disposal system was necessary. Now the mall can meet its water requirements, supporting the operation of the facility's 130-store outlet center, office complex, hotel, movie theater and restaurant.

Schools. The Copper Hill School in Raritan Township, N.J., recycles wastewater from school toilets, the cafeteria and gym showers to be used for toilet flushing, saving the elementary school about 12,000 gal of wastewater each day. The 20% of treated wastewater that is not used in the recycling process is recharged to groundwater.

Golf courses. The Hawk Pointe Golf Course in Washington, N.J., reclaims and treats wastewater to supply the significant volumes of water required to irrigate the course.

Implementation

While the benefits of water reuse are clear, only a small percentage of American communities have implemented such systems and technologies. In order to successfully implement water reuse projects, communities need to prioritize the financing of wastewater infrastructure projects.

Public-private partnerships, as well as the Clean Water State Revolving Fund, offer solutions for funding such investments. Collaboration between wastewater and water agencies is also needed to set policies and develop system and facility plans that optimize water recycling opportunities. Community leaders must also perform public outreach to educate consumers about water reuse and mitigate any public safety and cost concerns.

Water reuse will play an increasingly important role in safeguarding our long-term water supply as water demand grows. While water reuse cannot solve scarcity issues alone, it is an essential part of a sustainable approach toward water resource management. www

References

For a list of references, visit www.wwdmag.com/lm.cfm/wd030906.

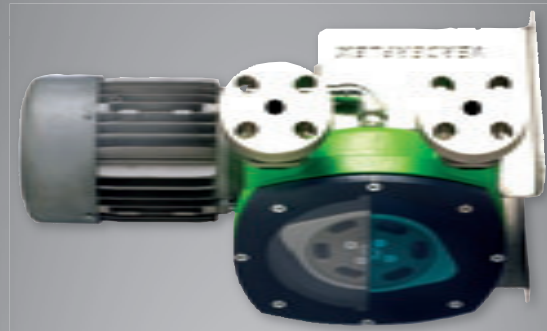
Wayne Morgan is president of West Virginia American Water Co. Morgan can be reached at 304.340.2000 or by e-mail at wayne.morgan@amwater.com.

For more information, write in 1106 on this issue's Reader Service Card.

WEBresources>>>

Related search terms from www.waterinfolink.com:
water reuse, public-private partnerships

For more information related to this article, visit
www.wwdmag.com/lm.cfm/wd030906



DOSING ■ FILLING ■ TRANSFERRING

BUILT TO LAST

Peristaltic Pumps
VERDERFLEX[®]

GPM Pumps, Inc.

110 Gateway Drive

Macon, GA 31210, USA

+1-800-832-4562

info@verderflex.com

www.verderflex.com

write in 702