

Reclaimed Water

Issue Definition

The Florida Department of Environmental Protection (FDEP) defines reclaimed water as water that has received at least secondary treatment and basic disinfection and is reused after flowing out of a domestic wastewater treatment facility;¹ to become available for reuse for a beneficial purpose. Extensive treatment and disinfection ensures that public health and environmental quality are protected.² In regions facing rapid population growth the task of mobilizing new water supplies to meet new demands, while also protecting the sustainability of Florida's resources is complex.³ Reclaimed water is a very important alternative water supply source that can play a major role. It saves water that would otherwise be withdrawn from freshwater ground or surface water sources to meet non-potable water supply needs such as for irrigation or other uses. Reuse of reclaimed water also reduces the reliance on traditional disposal methods such as ocean outfalls or deep disposal wells that otherwise waste the resource.

Background

While the number and capacity of reclaimed water facilities is increasing, much of the potential as a resource remains underutilized.

Published in FDEPs 2006 Reuse Inventory, there were about 468 domestic wastewater treatment facilities with a permitted capacity of 0.1 MGD (Million Gallon per Day) or greater that produced reclaimed water for reuse. Florida's domestic wastewater treatment facilities have a total permitted treatment plant capacity of about 2,076 MGD and treated 1,427 MGD of domestic wastewater in 2006. These facilities serve 441 reclaimed water systems. Approximately 663 MGD from these facilities is reused for beneficial purposes, as shown in the table below, and are up more than 50% since the Departments *Risk Impact Statement* analysis was published in 1998. The total reclaimed water capacity in 2006 was 1,368 MGD.⁴

As a result of significant and commendable increases in reuse capacity over the last 10-years, the current wastewater reuse utilization is 41% of wastewater treatment plant flows and the capacity represents 56% of the total permitted domestic wastewater treatment statewide.⁵

Traditional wastewater disposal or management options are becoming constrained.

Effluent disposal in Florida is manifest in three ways: (1) Into water bodies (including ocean outfalls), (2) Deep well injection, and (3) Land application (see figure below). Aside from the obvious water quantity concerns, discharges to surface waters and concern for potential water quality impacts make consumptive use permitting difficult without advanced

¹ FDEP Website <http://www.dep.state.fl.us/legal/rules/wastewater/62-610.pdf>

² FDEP Website <http://www.dep.state.fl.us/water/reuse/index.htm>

³ JAWRA Vol. 43, No. 4. August 2007

⁴ FDEP, August 2007. 2006 Reuse Inventory. Page 2

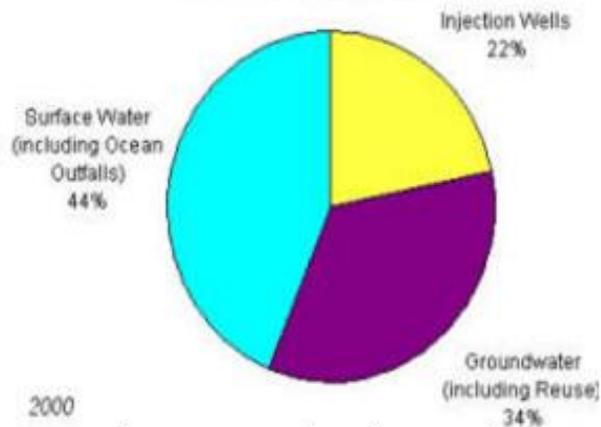
⁵ FDEP Website <http://www.dep.state.fl.us/water/reuse/activity.htm>

Table 2. Summary of Reuse Activities

Reuse Type	Number of Systems (1)	Reuse Capacity (mgd)	Reuse Flow (mgd)	Area (acres)
Public Access Areas & Landscape Irrigation				
Golf Course Irrigation	194	273.07	123.63	58,899
Residential Irrigation	108	288.52	158.37	127,352
Other Public Access Areas	105	150.15	70.92	29,987
Subtotal	407	711.74	352.91	216,238
Agricultural Irrigation				
Edible Crops	18	58.81	12.57	14,067
Other Crops	109	139.00	70.01	24,468
Subtotal	127	197.81	82.58	38,535
Ground Water Recharge & Indirect Potable Reuse				
Rapid Infiltration Basins	162	172.01	82.52	6,565
Absorption Fields	20	9.16	2.76	537
Surface Water Augmentation	0	0	0	NA
Injection	1	10.00	7.35	NA
Subtotal	183	191.17	92.63	7,102
Industrial				
At Treatment Plant	94	101.20	54.23	255
At Other Facilities	25	62.00	36.17	1,440
Subtotal	119	163.20	90.40	1,695
Toilet Flushing	6	0.58	0.42	NA
Fire Protection	1	0	0.1	NA
Wetlands	17	93.96	41.10	4,554
Other Uses	9	9.79	2.59	29
2006 Totals	441	1,368.25	662.73	268,153
2005 Totals	438	1,325.07	659.68	232,341
% Change	+0.68	+3.26	+0.46	+15.41

Notes: (1) The numbers of facilities are not additive since a single facility may engage in one or more reuse activity.
 (2) Discrepancies in column totals are due to internal rounding associated with the development of this summary table.

Effluent and Reclaimed Water in Florida Use and Disposal



[HTTP://WWW.DEP.STATE.FL.US/WATER/WASTEWATER/FACTS.HTM](http://www.dep.state.fl.us/water/wastewater/facts.htm)

levels of wastewater treatment. Nutrient enrichment of Florida’s surface waters continues to press for solutions in light of new legislation to protect Florida’s springs and near shore reefs from degradation due to wastewater disposal. Existing legislation, like the Clean Water Act, requires the development of Basin Management Action Plans to address Total Maximum Daily Loads (TMDLs) for impaired water bodies that could affect wastewater disposal within those

basins. Furthermore, new legislation to eliminate ocean outfalls as a primary disposal method and recent regulatory changes in the delegation of the federal underground injection control (UIC) program demonstrates the further trend to constrain treated effluent disposal options. Another growing concern is the fate of microconstituents in all water sources including reclaimed water. Alternative technologies to remove these very low level constituents may in time prove useful in achieving removal from the waste stream.⁶ Achieving advanced treatment levels however will likely require new or modified regulations, supplemental infrastructure development funding, and public education.

Reclaimed water is becoming more significant as a viable alternative to traditional disposal options; it not only saves water and minimizes traditional disposal, but also can serve to recharge and augment available water resources.

Most reuse is seasonal.

In those areas that have been reusing wastewater for irrigation purposes for an extended period of time, annual utilization records substantiate the expected seasonality of reuse, resulting in a large surplus of reuse water in the wet season when wastewater flows tend to be at their peak. Greater utilization of reclaimed water may be possible for uses such as power plant cooling water, large building chillers, indirect potable reuse (ground water replenishment), and natural system restoration and augmentation. Many of these uses require greater degrees of treatment than non-potable irrigation uses.

Issue Criticality for Water Supply

The State of Florida has determined that water reuse is a viable strategy, central to any discussion of water resource management.⁷ Reclaimed water is a very important alternative water source for irrigation and can greatly help reduce the demand for drinking water in Florida. In central Florida studies have shown that irrigation accounted for 64% of the residential use volume for all monitored homes.⁸ Developing strategies should focus on encouraging the use of reclaimed water in all water use sectors and throughout all areas of Florida, even to the extent that the use of reclaimed water is promoted in lieu of other water sources, discouraging also wasteful effluent disposal practices. The state has recognized that strategies to deal with the effective use of seasonal reclaimed water storage, supplemental water supplies, and reuse system interconnects are among the means to stimulate reuse in Florida.

Florida 2030 Vision

By 2030, it is envisioned that the reuse component of water supply throughout Florida will have addressed the following major issue areas, in descending order of importance:

⁶ Florida Water Resources Journal. June 2007. *The Fate of Pharmaceuticals after Wastewater Treatment*. Page 29.

⁷ Reuse Coordinating Committee and the Water Conservation Initiative Water Reuse Work Group. 2003. *Water Reuse for Florida; Strategies for Effective Use of Reclaimed Water*.
http://www.dep.state.fl.us/water/reuse/docs/valued_resource_FinalReport.pdf

⁸ Journal of Irrigation and Drainage Engineering. 2007. Vol. 133, Issue 5. Pgs. 427-494.

1. Balance regulation of reclaimed water for the purpose of achieving efficiency of use while also optimizing the availability of water resources and avoiding unintended adverse impacts of over regulation.
2. Encourage efficient irrigation practices and use of reclaimed water in-lieu of other water sources, optimizing reclaimed water resources when used for irrigation (e.g. agricultural irrigation, residential landscape irrigation, industrial, commercial, institutional, and indoor water use sectors).
3. Link reuse to regional water supply planning (Integrated Water Supply Planning) through provision of reclaimed water use incentives. In areas where water management districts have limited new or increased water withdrawals, create a primary incentive, by rule, which enables reclaimed water providers to apply for offset credits created by the substitution of reclaimed water supplied by the provider for existing, permitted water withdrawals.
4. Develop consistent rules (including minimum efficiency measures) that allow for and encourage supplementation of reclaimed water with surface or groundwater when appropriate to do so.
5. Discourage wasteful effluent disposal by encouraging and facilitating seasonal storage, ASR, groundwater recharge, indirect potable reuse, conversion from septic systems to public utility systems, and stormwater reuse systems.
6. Implement viable and sustainable alternative water supply funding programs.
7. Ensure Continued Safety of Water Reuse by continuing support of research and by enforcement of reclaimed water inspection rules (i.e. cross-connection control).
8. Fund the FDEP to allow completion of the second phase of the study to better define the economic feasibility test for reclaimed water.

Options and Path Forward to Achieve FL 2030 Vision

In order to achieve these goals, local governments must work together in partnership with the Florida Department of Environmental Protection and the water management districts toward consistent reuse goals and policies. Local governments must create Integrated Water Resource Plans (IWRP) that are consistent with water management district consumptive use permits and regional water supply plans. There must also be greater state effort to increase public education, understanding, and acceptance of the use of reclaimed water for non-potable purposes.

Many of the above strategies to encourage water reuse development throughout Florida were identified jointly by the Reuse Coordinating Committee and the Water Conservation Initiative's Water Reuse Work Group in 2003. The strategy recommendations of that group remain today as viable actions for implementation as they were in 2003. The Committee's report presented background information on water reuse, provided a summary of Florida's Water Reuse Program, traced the development of water reuse in Florida, and detailed 16 major, interrelated strategies for ensuring efficient and effective use of reclaimed water. The report identified 11 legislative concepts, 15 rulemaking efforts, and 12 research activities that would further support

and implement effective water reuse strategies.⁹ Given the ever increasing pressure on Florida's water resources from growth, weather conditions, and new laws and regulations that limit access to traditional supplies, those strategies that have long been recommended are now critically important to implement, ensuring protection of Florida's water resources.

Financing and incentives to promote this vision cannot be overstated. Recently, the American Society of Civil Engineers published a report, which recognized that when faced with limited funding and a fast growing population, most of Florida's counties and cities cannot meet their existing wastewater infrastructure needs let alone the anticipated need for \$13 Billion in additional wastewater infrastructure needed statewide. Clean and safe water is no less a national priority than defense, interstate highways and aviation systems, but local funds cannot meet this challenge alone. Furthermore, wastewater infrastructure generally does not have the dedicated, long-term sources of federal funding that others do. If Florida fails to meet the increasing investment needed in the next two decades, it risks reversing the public health, environmental, and economic gains of the past three decades since the enactment of the 1972 Clean Water Act. There needs to be wastewater infrastructure funding to provide a reliable source of funding to maintain and improve existing facilities and build the wastewater infrastructures for Florida's future.¹⁰

Issues for Consideration

The challenge for Florida utilities is to manage growth without compromising public health and the environment, but to do so in a way that is practical and implementable. Reclaimed water will play an increasingly important role in developing strategies that optimize the water resources of the state while also discouraging wasteful effluent disposal practices.

In 1998, the Department published a risk impact statement, assessing changes in levels of risk associated with proposed revisions to the reuse rules, concentrating on ground water recharge and indirect potable reuse activities that included:

1. Refinement of the rules governing ground water recharge and indirect potable reuse in Part V of Chapter 62-610, F.A.C.
2. Creation of a rule governing reclaimed water aquifer storage and recovery.
3. Creation of a rule governing the use of various water supplies to augment the available supplies of reclaimed water.
4. Creation of a rule governing blending of demineralization concentrates with reclaimed water.
5. Refinement of existing requirements for use of reclaimed water in cooling towers.

The study concluded that proposed rule revisions would generally refine existing rule requirements, but were expected to have relatively minor impacts on public health. Notably though, the assessment concluded that where rule requirements were proposed and accepted for change, the rules would become more stringent, resulting in changes that would be expected

⁹ FDEP. June 2003. *Water Reuse Strategies for Effective Use of Reclaimed Water*. Page 43-46.

¹⁰ ASCE. 2008. *2008 ASCE Florida Infrastructure Report Card WASTE WATER*. Pages 1-2.

to result in greater protection of public health.¹¹ At the same time, though, more stringent rules further limit effluent disposal over concerns for water quality that limit the traditional effluent disposal methods in Florida, giving greater emphasis on the need for reuse

The state's underlying rulemaking objectives are to ensure that Florida's rules protect environmental quality and public health. Existing rules have been developed based on the best available scientific data and have been regarded as being fully protective of public health and environmental quality. Florida 2030 efforts should focus on developing realistic state-wide goals for reclaimed water that continue to protect public health while simultaneously achieving state-wide reclaimed water utilization or overall average efficiency rate objectives.

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¹¹ FDEP. 1998. *Risk Impact Statement Phase II Revisions to Chapter 62-610 F.A.C. Docket No. 95-08R.*