

Evaluating the Feasibility of Water Reuse

May 12, 2005

Reuse Coordinating Committee

Department of Agriculture and Consumer Services
Department of Environmental Protection
Department of Health
Department of Transportation
Northwest Florida Water Management District
Public Service Commission
St. Johns River Water Management District
South Florida Water Management District
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Suwannee River Water Management District

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OBJECTIVE

The objective of this report is to summarize and evaluate the statutory language, rules, and procedures for evaluating the feasibility of water reuse. In addition, recommendations for improving the process are included.

BACKGROUND

Water reuse has become very popular in Florida. In 2003, some 469 domestic wastewater treatment plants (WWTPs) are permitted to provide 603 million gallons per day (MGD) of reclaimed water for reuse throughout Florida. Florida irrigated 154,234 residences, 427 golf courses, 486 parks, and 213 schools with reclaimed water in 2003. The reuse capacity of these WWTPs represents 54 percent of the total WWTP capacity in the state (1).

Water reuse offers significant potential to conserve water and to augment available water supplies as reflected in the Water Conservation Initiative. Water reuse is a means for effectively managing wastewater in an environmentally sound fashion and reduces impacts on sensitive surface waters. Water reuse has become a key component of both water resources management and wastewater management in Florida.

Recognizing the importance of water reuse, the Florida Legislature established the encouragement and promotion of water reuse as formal state objectives in 1989. These objectives are contained in Chapters 373 and 403, Florida Statutes (F.S.) (2,3). Florida's Water Reuse Program was implemented in response to these objectives. Among the key components of the Water Reuse Program are requirements for reuse of reclaimed water. The requirement to implement water reuse is predicated upon the feasibility of reuse.

REUSE FEASIBILITY STUDIES

Chapter 403, Florida Statutes

This chapter provides the primary statutory authority for the DEP and its environmental control activities. The statute authorizes the Department to regulate wastewater management facilities, and to issue construction and operation permits for these facilities.

Section 403.064, F.S., requires permit applicants planning to construct or operate a domestic wastewater treatment facility located within a water resource caution area to prepare a reuse feasibility study as part of their permit application. It also dictates the elements to be evaluated and contained within the feasibility study. The feasibility study is an evaluation of the costs and benefits, rates and fees, water savings, and environmental, economic, and technical constraints associated with implementing water reuse in an area. In essence, reuse feasibility studies are conducted in order to evaluate the capability of a domestic wastewater utility to implement water reuse.

Requirements for evaluating the feasibility of water reuse are contained in subsection (2) of Section 403.064, F.S. The statute requires that reuse feasibility studies include, but not be limited to, the following:

- (a) Evaluation of monetary costs and benefits for several levels and types of reuse.
- (b) Evaluation of water savings, if reuse is implemented.
- (c) Evaluation of rates and fees necessary to implement reuse.
- (d) Evaluation of environmental and water resource benefits associated with reuse.
- (e) Evaluation of economic, environmental, and technical constraints.
- (f) A schedule for implementation of reuse (phased implementation must be considered).

Section 403.064, F.S., was created in 1989 and has been refined on several occasions. The original section addressed feasibility study determinations as follows:

"The study required under subsection (2) shall be performed by the applicant, and the applicant's determination of feasibility is final."

The language in subsection (2) was refined on several occasions. The most recent revisions occurred in 2004 and the language now reads:

"The study required under subsection (2) shall be performed by the applicant, and, if the study shows that the reuse is feasible, the applicant must give significant consideration to its implementation if the study complies with the requirements of subsections (2) and (3)."

This change is significant because the applicant no longer has the sole ability to determine the feasibility of reuse.

A reuse feasibility study prepared under subsection (2) of Section 403.064, F.S., also satisfies a water management district requirement to conduct a reuse feasibility study. Section 403.064(6), F.S., states:

"A reuse feasibility study prepared under subsection (2) satisfies a water management district requirement to conduct a reuse feasibility study imposed on a local government or utility that has responsibility for wastewater management. The data included in the study and the study's conclusions shall be given significant consideration by the applicant and the appropriate water management district in an analysis of the economic, environmental, and technical feasibility of providing reclaimed water for reuse under Part II of chapter 373, and shall be presumed relevant to the determination of feasibility. A water management district shall not require a separate study when a reuse feasibility study has been completed under subsection (2)."

Section 403.064(14), F.S., requires domestic wastewater treatment facilities that dispose of effluent by Class I deep well injection to implement reuse to the degree that reuse is feasible, based upon the applicant's reuse feasibility study completed under subsection (2). Applicable permits issued by the DEP must be consistent with the requirements of subsection (14). Subsection (14) does not limit the use of a Class I deep well injection facility as backup for a reclaimed water reuse system, and it applies only to domestic wastewater treatment facilities located within, serving a population located within, or discharging within a water resource caution area.

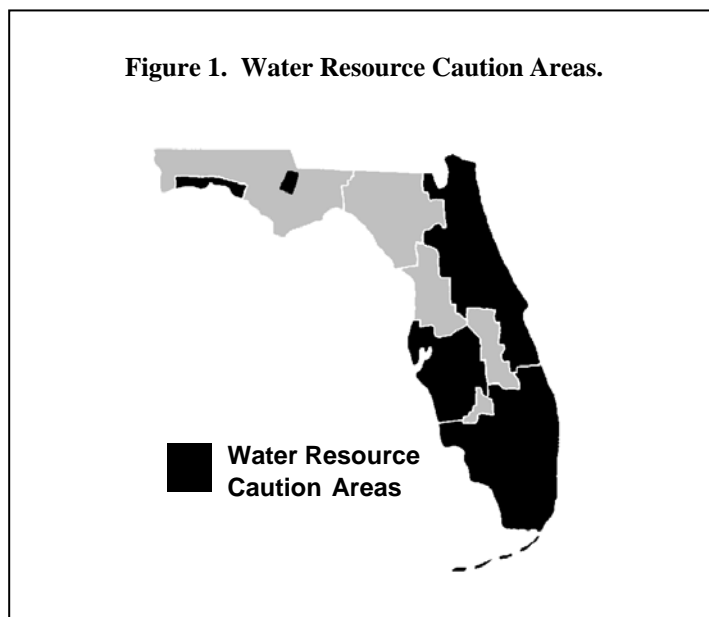
Similarly, subsection (15) requires domestic wastewater treatment facilities that dispose of effluent by surface water discharges or by land application methods to implement reuse to the degree that reuse is feasible, based upon the applicant's reuse feasibility study conducted under subsection (2). However, this requirement does not apply to surface water discharges or land application systems which are already categorized as reuse under department rules. Furthermore, subsection (15) does not limit the use of a surface water discharge or land application facility as backup for a water reuse system and only applies to facilities located within, serving a population within, or discharging within a water resource caution area. Again, applicable permits issued by the DEP must be consistent with the requirements of this subsection.

The full text of Section 403.064, F.S., is contained in Appendix A.

Chapter 62-40, F.A.C.

Rule 62-40.310(1)(d), Florida Administrative Code (F.A.C.), requires water management programs to "Advocate and direct the reuse of reclaimed water as an integral part of water and wastewater management programs."

Rule 62-40.416(1), F.A.C., directs the water management districts to assess their water resources and to designate "water resource caution areas". The designated water resource caution areas (areas having current or future critical water supply problems) are shown in Figure 1. Rule 62-40.416(2), F.A.C., requires domestic wastewater treatment facilities within these water resource caution areas to implement a reasonable amount of water reuse, unless such reuse is not economically, environmentally, or technically feasible (4).



Rule 62-40.416(4), F.A.C., enables the water management district to require reuse of reclaimed water outside of designated water resource caution areas, but only if the following criteria are met:

- (a) Reclaimed water is readily available;
- (b) Objective evidence demonstrates that reuse is economically, environmentally, and technically feasible; and
- (c) The water management district has adopted rules for reuse in these areas.

Chapter 62-40, F.A.C., was revised in 2004. These pending changes are held in abeyance pending resolution of an administrative challenge. If the proposed changes are ultimately adopted, when feasible, water reuse will be required statewide -- not just within designated water resource caution areas.

The Antidegradation Policy

The Antidegradation Policy is contained in Chapter 62-4, F.A.C., entitled "Permits," and in Chapter 62-302, F.A.C., entitled "Surface Water Quality Standards." These rules require an applicant for a new or expanded surface water discharge to demonstrate that the new or expanded discharge is in the public interest. As part of the public interest, the applicant must evaluate the feasibility of implementing water reuse in lieu of the proposed new or expanded surface water discharge. The applicant must evaluate the feasibility of reuse by preparing a feasibility study (5,6).

If reuse is determined to be economically and technologically reasonable, then reuse will be preferred over the proposed surface water discharge or expanded surface water discharge.

The Indian River Lagoon System and Basin Act

This Act, which is contained in Chapter 90-262, Laws of Florida, provided increased protection to the Indian River Lagoon System (7). The Act established three objectives for domestic wastewater treatment plants in this area:

- (1) The elimination of surface water discharges;
- (2) The investigation of the feasibility of reuse; and
- (3) The centralization of wastewater collection and treatment facilities.

Section 2 of the Indian River Lagoon System and Basin Act dictated that no new discharges or increased loadings from WWTPs be permitted, and required all discharges to be eliminated by July 1, 1995, with a few exceptions:

- (1) The applicant demonstrated that no other practical alternative exists and that the discharge would be treated to advanced treatment levels or higher; or
- (2) The applicant demonstrate that the discharge would not cause or contribute to water quality violations nor hinder water quality restoration efforts in the Basin; or

- (3) The discharge is an intermittent discharge occurring only during wet weather conditions.

Section 3 of the Act required owners of existing domestic wastewater treatment plants within the Basin to investigate the feasibility of using reclaimed water for beneficial purposes by July 1, 1992. Reuse feasibility studies under this section were completed by the domestic wastewater treatment plants.

Water Management District Rules and Programs

Florida's water management districts has its own guidance, policies, and rule requirements relational to reuse feasibility studies. Of course, the water management districts' rules and programs must be consistent with Chapter 62-40, F.A.C.

Northwest Florida Water Management District (NFWWMD). The NFWWMD, through coordination and cooperation, has achieved a high level of reuse by utilities that have responsibility for wastewater management. The NFWWMD promotes direct reuse through funding support and conditioning of consumptive use permits belonging to utilities and to potential end users. Feasibility studies are required in some cases. The NFWWMD will accept a copy of a reuse feasibility study completed to comply with Rule 62-610.820(8) F.A.C.

The NFWWMD has very little contact from utilities prior to preparation of feasibility studies. The District communicates with utilities on a fairly regular basis through the permitting process, but utilities generally do not contact the District to determine its reuse priorities.

The DEP can actively urge wastewater permittees to contact the District prior to performing their feasibility studies and then send a copy of the completed feasibility reports to the District in order to assist the District in promoting reuse in the future.

St. Johns River Water Management District (SJRWMD). The SJRWMD Governing Board's policy is to provide greater availability of reclaimed water and to implement reuse to the maximum extent feasible District-wide to help conserve available water resources. SJRWMD accomplishes the State of Florida objective to encourage and promote water conservation and reuse through the regulatory program, inter-agency coordination, the water supply planning process, and cost-share funding. The entire district has been designated as a Water Resource Caution Area.

Chapter 40C-2, F.A.C., SJRWMD's water use permitting rule, requires the use of reclaimed water where feasible. When reclaimed water is readily available it must be used in place of higher quality water sources unless the applicant demonstrates that it is not economically, environmentally, or technically feasible. In determining whether reclaimed water is readily available, the District will consider the following factors:

- (1) Whether a suitable source of reclaimed water exists,
- (2) Whether the source is offered to or controlled by the applicant,

- (3) Whether the applicant is capable of accessing the source, and
- (4) Any other relevant information.

As needed, consumptive use permit reviewers will coordinate with DEP or the Public Service Commission (PSC) regarding reuse feasibility and permitting status. In east-central Florida, quarterly meetings are held between the DEP, PSC, SFWMD, and SJRWMD to discuss permitting activities for the various utilities.

The SJRWMD Water Supply Plan is consistent with Rule 40C-2.301(4)(f), F.A.C., which requires the lowest acceptable quality water source be utilized for each consumptive use. This would include the use of reclaimed water to replace the use of groundwater or potable water for nonpotable water uses, or recharge the Floridan aquifer. This criterion is not used to require the use of lower quality sources for direct human consumption or human food preparation. Entities must evaluate the feasibility of using lower quality sources for these purposes. However, it is possible that the unavailability of potable water may necessitate the development of lower quality water sources in order to meet projected demands for direct human consumption and human food preparation.

SJRWMD policy concerning reuse feasibility studies is to provide technical assistance to consumptive use permit applicants preparing reuse feasibility studies. If a reuse feasibility study determines that water reuse is not feasible, SJRWMD may require the consumptive use applicant use specific criteria or provide additional information for the reuse feasibility study. If the applicant's determination that water reuse is not feasible due to economic reasons, the consumptive use permit reviewers may consult with an economist. The economist will review the financial information submitted by the applicant for accuracy and appropriateness.

The costs to complete reuse feasibility studies is usually covered by local governments, water utilities, and other major water users. However, SJRWMD has provided financial assistance for the completion of a small number of reuse feasibility studies. In these cases, SJRWMD has shared up to 50 percent of the cost of reuse feasibility studies. SJRWMD encourages the development of regional reuse projects involving two or more cooperators, and has provided funding for some regional projects. SJRWMD has spent approximately \$460,000 to complete 25 reuse feasibility studies since 1996.

South Florida Water Management District (SFWMD). In the South Florida Water Management District, all applicants are required to address the use of reclaimed water as part of obtaining a permit for water use. For water users, this involves an evaluation of using reclaimed water as a source of water. For public water suppliers, who control directly or indirectly a wastewater treatment facility, this involves implementing a reuse program that has been determined to be feasible. District rules governing the consumptive use of water are set forth in Chapter 40E-2, F.A.C., and the District's Water Use Basis of Review, Sections 3.2.3, 3.2.3.1, 3.2.3.2, and 3.2.3.3.

In all areas of the District, reclaimed water is required to be used, unless it is demonstrated by the applicant that its use is not environmentally, economically or technically feasible. For

projects located either entirely or partially within areas designated by local ordinance as a mandatory reclaimed water zone, a feasibility study is not required. Permit applicants in these areas will only be allocated that quantity of water necessary to meet remaining reasonable-beneficial demands, if necessary, and a quantity necessary for emergency backup.

The following criteria are used to demonstrate feasibility:

- (1) Environmental Feasibility: The use of reclaimed water is considered environmentally feasible if the Department has permitted the reuse facility that will provide the reclaimed water supply and has permitted the use.
- (2) Technical Feasibility: The use of reclaimed water is considered technically feasible if an uncommitted, adequate supply of reclaimed water is available at the site of the proposed use to meet all or part of the applicant's water needs.
- (3) Economic Feasibility: If the applicant asserts that reuse is not economically feasible, then the applicant must provide the District with an assessment of the economic feasibility of the use of reclaimed water. The applicant's economic feasibility analysis must consider all of the following:
 - (a) Costs associated with purchase of a reclaimed water supply source including: pump and distribution costs, storage costs, monthly rates charged for the reclaimed water supply, and costs associated with risk of loss of reclaimed supply;
 - (b) Costs associated with development of an otherwise permissible supply source including: well, pump, and distribution; and operational costs including increased fertilizer costs and where applicable: power costs, pumping, and system operation and maintenance costs;
 - (c) Alteration in the rates charged by the permit applicant's business to account for costs associated with using reclaimed water; and
 - (d) Other factors affecting the economic feasibility of using reclaimed water as proposed by a permit applicant in light of their particular situation.

In addition to the above, for applicants located in areas that are not designated as a Water Resource Caution Area, reclaimed water must be used when it is readily available. In determining whether reclaimed water is readily available, the District will consider the following factors:

- (a) Whether a suitable source of reclaimed water exists;
- (b) Whether the source is offered to or controlled by the Applicant; and
- (c) Whether the Applicant is capable of accessing the source through distribution lines.

Public water supply utilities that control, either directly or indirectly, a domestic wastewater treatment facility, and which have determined that the use of reclaimed water is feasible pursuant to Section 403.064, F.S., must provide the District the plan and implementation schedule, including areas to be served, location of reclaimed water lines, capacities, flow projections, uncommitted capacity, and copies of local reuse ordinances as part of their

application. Applicants that do not control a domestic wastewater treatment facility are required to use reclaimed water for irrigation purposes unless it is determined that the use of reclaimed water is not feasible.

Southwest Florida Water Management District (SWFWMD). The SWFWMD manages regulatory aspects of the reclaimed water provisions in Florida's Water Resource Implementation Rule (Chapter 62-40, F.A.C) through its water use permitting and year-round water conservation measures rules.

The Water Use Permitting Rule (Chapter 40D-2, F.A.C.) promotes reuse via general conditions for issuance of permits and several specific permit conditions. As part of the applicant's general demonstration that its water use will be reasonable and beneficial, is in the public interest, and will not interfere with any existing legal use of water, the applicant must provide reasonable assurances that it will utilize the lowest quality water it is able to use [Rule 40D-2.301(1)(e)] and incorporate reuse to the greatest extent practicable [Rule 40D-2.301(1)(k)]. Within designated water resource caution areas, Permittees must continue to demonstrate the efficient use of available reclaimed water resources. For example, in the Southern Water Use Caution Area, they must comply with the following permit conditions:

- (a) Beneficial Reuse (goal of 50% of each wastewater generator's total annual effluent flow)
- (b) Reuse Feasibility (investigations required, in accordance with Section 403.064, F. S.)
- (c) Reuse Implementation (required, when use of reclaimed water is found to be feasible)
- (d) Standby Quantities (special permit for ground/surface water, should reuse supply be lost)
- (e) Golf-Residential Linkage (golf course must convert when development's WWTP can support)
- (f) Annual Reporting (reclaimed water providers and receivers must report locations, quantities)
- (g) Monthly Metering (reclaimed water receivers must meter, record and report usage)
- (h) Conservation Plans (include reuse, get approval for golf roughs as wet weather disposal)

The Year-Round Water Conservation Measures Rule (Chapter 40D-22, F.A.C.) promotes reuse by exempting the use of 100 percent reclaimed water sources from the normally allowable lawn irrigation schedule (maximum of two days per week watering). Key provisions were carefully built into the September 2003 amendments to Rule 40D-22 in order to promote efficient utilization of available reclaimed water resources. Specifically, the use of reclaimed water blends (reclaimed water blended with some other irrigation water supply) is also exempt from the allowable lawn irrigation schedule if any of the following situations apply, pursuant to Rule 40D-22.201(3)(h):

- (a) The "other supply" is incidental stormwater that enters a reclaimed water storage pond,

- (b) The "other supply" is regulated by a water use permit (WUP) that includes quantities specifically for blending,
- (c) The "other supply" is water recovered from a reclaimed water aquifer storage and recovery (ASR) well permitted by DEP, or
- (d) The reclaimed water provider is implementing an authorized variance for the blended supply

In conjunction with its successful funding assistance programs (Cooperative Funding Initiative, New Water Sources Initiative and Water Supply & Resource Development), the SWFWMD's current rules have resulted in reclaimed water feasibility studies and construction of reuse systems by nearly all eligible wastewater utilities within its jurisdiction. Since 1987, the SWFWMD has encouraged the efficient and effective development of reclaimed water systems by providing more than \$205 million dollars for 249 reclaimed water projects (including reclaimed water feasibility, design, transmission, distribution and storage). These projects have resulted in the construction of approximately 850 miles of reclaimed water mains and 200 mgd of reclaimed water being made available to customers. As a result of these projects and others approximately half of wastewater flows within the SWFWMD are currently utilized for reuse purposes (8).

Suwannee River Water Management District (SRWMD) . The SRWMD has a relatively small population and few water supply problems. Hence this water management district has not identified any Water Resource Caution Areas and has not been very active in the Water Reuse Program.

Chapter 62-610, F.A.C.

Florida's reuse rules are contained in Chapter 62-610, F.A.C (9). Florida's reuse rules are detailed and comprehensive and are consistent with the United States Environmental Protection Agency's *Guidelines for Water Reuse* (10).

Rule 62-610.820, F.A.C., includes DEP requirements for reuse feasibility studies. Rule 62-610.820, F.A.C., lists several rules, statutes, and laws that require preparation of reuse feasibility studies. Rule 62-610.820(1), F.A.C., notes that reuse feasibility studies are required by the following:

- (a) Section 403.064, F.S., for domestic wastewater facilities located within, serving a population within, or discharging within designated water resource caution areas.
- (b) The Indian River Lagoon System and Basin Act, contained in Chapter 90-262, Laws of Florida.
- (c) The Antidegradation Policy in Rules 62-4.242 and 62-302.300, F.A.C., for new or expanded surface water discharges.
- (d) By rules of the applicable water management district.

Rule 62-610.820, F.A.C., also gives the conditions for when reuse feasibility studies are not required. The rule notes that applicants meeting both of the following conditions are not

required to submit reuse feasibility studies with permit applications for domestic wastewater facilities:

- (a) The only rule or statute that requires preparation of a reuse feasibility study is Section 403.064, F.S., and
- (b) One of the following conditions exists:
 - 1. The domestic wastewater treatment facility has an existing or proposed permitted capacity, whichever is larger, of less than 0.1 MGD, or
 - 2. The permitted reuse capacity associated with the domestic wastewater treatment facility equals or exceeds the total existing or proposed permitted capacity, whichever is larger, of the domestic wastewater treatment facility.

Also, Rule 62-610.820(4), F.A.C., requires reuse feasibility studies to be prepared in accordance with Rule 62-610.300(1)(l), F.A.C. Rule 62-610.300(1)(l), F.A.C., adopts the ***Guidelines for Preparation of Reuse Feasibility Studies for Applicants Having Responsibility for Wastewater Management*** (11) by reference into Chapter 62-610, F.A.C. The guidance document is designed to aid applicants in the development of reuse feasibility studies.

Rule 62-610.820(5), F.A.C., allows reuse feasibility studies to deviate from the required format or content specified in Rule 62-610.300(1)(l), F.A.C., if the alternative format or study content provides the same level of evaluation as specified in Rule 62-610.300(1)(l), F.A.C.

Rule 62-610.820(8), F.A.C., encourages utilities preparing a reuse feasibility study in response to one or more of the items in Rules 62-610.820(1)(a), (b), or (c), F.A.C., to contact the appropriate water management district before initiation of the feasibility study to obtain information about the water management district's reuse priorities for the area, and to identify any additional alternatives which the water management district would like to have evaluated in the reuse feasibility study. If additional alternatives are identified by the water management district, the applicant is encouraged to evaluate the alternatives using the methods specified in Rule 62-610.300(1)(l), F.A.C. This requirement is important since it reinforces and supports subsection (6) of Section 403.064, F.S., which states that reuse feasibility studies prepared under subsection (2) satisfy a water management district requirement to conduct a reuse feasibility study.

The full text of Rule 62-610.820, F.A.C., is contained in Appendix B.

REUSE FEASIBILITY STUDY GUIDELINES

In 1991, the Reuse Coordinating Committee [which at that time consisted of the DEP, the Public Service Commission (PSC), and the five water management districts] published a guidance document entitled ***Guidelines for Preparation of Reuse Feasibility Studies for Applicants Having Responsibility for Wastewater Management*** (11). These guidelines were adopted by reference into Rule 62-610.300(1), F.A.C. Rule 62-610.820, F.A.C., and Section 403.064(2), F.S., require the use of the guidelines in preparing reuse feasibility studies.

In 1996, the Reuse Coordinating Committee published the *Guidelines for Preparation of Reuse Feasibility Studies for Consumptive Use Permit Applicants* (12). This document was developed to aid consumptive use permit applicants in the preparation of reuse feasibility studies.

Both the *Guidelines for Preparation of Reuse Feasibility Studies for Applicants Having Responsibility for Wastewater Management* and the *Guidelines for Preparation of Reuse Feasibility Studies for Consumptive Use Permit Applicants* can be downloaded from DEP's website at www.dep.state.fl.us/water/reuse/techdocs.htm.

Domestic Wastewater Feasibility Study Guidelines

The purpose of this document is to define the contents of reuse feasibility studies. This document addresses the following:

- (1) Identification of alternatives to be evaluated;
- (2) Evaluation of costs using present value analysis;
- (3) Assessment of environmental impacts;
- (4) Evaluation of resulting charges and fees; and
- (5) Evaluation of technical feasibility.

Alternatives. Reuse feasibility studies are required to identify and evaluate at least two alternatives - the "no action" alternative, and implementation of a public access reuse system regulated by Part III of Chapter 62-610, F.A.C.

The no action alternative must show what would happen if the existing system were to be kept in place over a 20-year period considering population growth, wastewater flows, and water supply demands.

The reuse alternative consists of three subalternatives that must be evaluated:

- (1) Maximum reuse or over 75 percent of the annual average daily flow for the design year to be reused,
- (2) Medium reuse or 40 to 75 percent of the flow reused, and
- (3) Minimal reuse or less than 40 percent of the flow reused.

The applicant may choose to evaluate other reuse options as well.

Present Value Analysis. Monetary costs and benefits must be identified and summarized as a net present value over the 20-year period. The analysis must be completed for each alternative and subalternative. The current discount rate to be used in the analysis is the discount rate developed annually by the federal government. This rate is published annually by the U.S. Environmental Protection Agency, and is published annually in the *Federal Register*.

Costs to be considered include: capital costs for wastewater collection and treatment, reclaimed water transmission lines, construction costs, replacement costs, and other related costs.

Benefits to be considered include: water savings due to the implementation of reuse; revenues received by the utility from the sale of reclaimed water, the sale of crops produced, the lease of lands, and any connection fees for reclaimed water service; the salvage value of pipes, equipment, pumps, structures, tanks, and land; and any other benefits.

Other benefits of reuse are to be spelled out in the feasibility report as well. Some of these benefits include: meeting the state objectives of water conservation and reuse, conservation of potable water supplies, postponement of expansion of water supply facilities, the ability to recharge aquifers, improved surface water quality resulting from the elimination of effluent discharge, fertilizer savings from nutrients contained in reclaimed water, and any other benefits that occur due to water reuse.

Water Savings. The analysis must also include an evaluation of the water saved by implementing the reuse alternatives. Water savings is calculated by subtracting the annual water use associated with the reuse alternative from the annual water use associated with the no action alternative. The average residential potable water rate charged by the predominant water supply utility within the reuse service area must be used to determine the monetary value of the water savings. This value must be included in the analysis as a revenue (benefit) for the reuse alternative.

Evaluation of Rates and Fees. As part of the feasibility analysis, the applicant must evaluate the effects of the alternatives and subalternatives on rates, fees, and user charges. The guidelines include worksheets to be used by publicly owned utilities and privately owned utilities to determine the effects of rates, fees, and user charges on each alternative and subalternative, including the no action alternative. Costs used in the worksheet should be allocated equitably between wastewater customers and users of reclaimed water. The worksheets included in the guidelines are consistent with the approach used in the *Financial Capability Guidebook* (13) published by EPA for the federal grants program.

Technical Feasibility. Each alternative and subalternative must also be evaluated in terms of technical feasibility. Technical problems or constraints that could render an alternative technically infeasible must be discussed and technical solutions to these problems must be included in the analysis, including their costs.

Report Outline. The feasibility guidelines specify the outline to be used to in preparing the feasibility report. The report should include the following sections or chapters: an introduction, a chapter on existing conditions, future conditions, a description of the alternatives considered, an evaluation of the alternatives, and a summary/conclusion section.

Two copies of the reuse feasibility study should be submitted to DEP and one copy to the appropriate water management district.

Consumptive Use Permittee Feasibility Study Guidelines

The purpose of this document is to provide guidance for water use permit applicants who have been requested by their water management district to a reuse feasibility study. These guidelines only apply to applicant's for consumptive use permits. The document addresses environmental feasibility, technical feasibility, and economic feasibility.

Environmental Feasibility. This section asks the applicant to provide:

- (1) An estimate of the available reclaimed water storage volume available at the proposed site,
- (2) Whether the storage is isolated or part of a surface water management system,
- (3) Whether the surface water management system discharges offsite and to what receiving body,
- (4) If there are any wetlands onsite, and whether the storage of reclaimed water will affect the seasonal fluctuations or water quality in the wetlands,
- (5) If there are public supply wells within 500 feet of the site to be irrigated with reclaimed water or any unlined reuse storage, and
- (6) If there are any other issues affecting the environmental feasibility of using reclaimed water for the proposed project.

Technical Feasibility. This section asks the CUP applicant to provide:

- (1) Whether reclaimed water is of acceptable quality to be used in the proposed project and if there are any limitations that might prevent the use of reclaimed water for the project;
- (2) How much reclaimed water can be supplied, if it would meet all the demands of the project, and if there is a backup or supplementary supply needed to meet the demand; and
- (3) If there are any other issues affecting the technological feasibility of the project.

Economic Feasibility. This section of the guidelines asks the CUP applicant to provide:

- (1) The new design or retrofit costs of converting to reclaimed water (The costs of using reclaimed water must be compared to the costs of the current source using a 20-year present value analysis);
- (2) The costs associated with any supplemental or back-up source proposed to for use with the reuse system; and
- (3) Any other issues affecting the economic feasibility of using reclaimed water for the project.

CONSISTENCY AND COORDINATION

Reuse Conventions

In 1993, the Reuse Coordinating Committee developed and published *Reuse Conventions* (14) to promote consistency and uniformity among the water management districts in development of the District Water Management Plans required by Chapter 62-40, F.A.C. The *Reuse Conventions* document defines the terms reuse, reclaimed water, feasible, water resource caution areas, and reuse feasibility study; and spells out how to evaluate the feasibility of reuse. The *Reuse Conventions* spells out the goals of the Reuse Coordinating Committee with respect to Florida's Water Reuse Program. While many of the rule citations contained in the *Reuse Conventions* currently are outdated, the contained description of Florida's Water Reuse Program generally remains applicable (14). The *Reuse Conventions* included details of how DEP and the water management districts were to coordinate in making feasibility determinations and implementing the mandatory water reuse requirements in accordance with Section 403.064, F.S., and Chapter 62-40, F.A.C.

The Reuse Strategies Report

In 2003, Florida's Reuse Coordinating Committee, in conjunction with the Water Conservation Initiative's Water Reuse Work Group, published a report titled, *Water Reuse for Florida: Strategies for Effective Use of Reclaimed Water* also known as the *Reuse Strategies Report* (15). The basic content of the *Reuse Conventions* report was validated, refined, and carried forward in the *Reuse Strategies Report*.

The centerpiece of the *Reuse Strategies Report* is a series of 16 strategies designed to encourage efficient and effective use of reclaimed water in Florida. The *Reuse Strategies Report* proposes legislative and rule language that, if adopted, could affect reuse feasibility through added emphasis on water reuse in the state's Comprehensive Planning Program, CUP incentives, and funding programs. The *Reuse Strategies Report* also includes a detailed discussion of the mandatory reuse requirements and outlines how the program was intended to apply to various utilities and water users as described in the *Reuse Conventions*. A copy of this section of the *Reuse Strategies Report* is included in Appendix C.

The *Reuse Strategies Report* can be downloaded from the Florida Department of Environmental Protection's website at www.dep.state.fl.us/water/reuse/flprog.htm.

RECOMMENDATIONS

It is recommended that the reuse feasibility study guidelines be refined and updated to reflect changes in related rules, statutes, and agencies' policies.

Some issues that could be considered in revising the feasibility study guidelines are:

- (1) Refining feasibility study guidelines by:

- (a) Updating rule references,
 - (b) Strengthening discussion of reuse experience and importance,
 - (c) Updating and refining the report throughout,
 - (d) Addressing the following 4 key scenarios for preparing reuse feasibility studies in a single document:
 1. Feasibility studies prepared by a wastewater utility that does not have responsibility for water supply.
 2. Feasibility studies prepared by a water supply utility that does not have responsibility for wastewater management.
 3. Feasibility studies prepared by a utility that has responsibility for both water supply and wastewater management.
 4. Feasibility studies prepared by “water users” (entities like farms, golf courses, power plants, industrial installations, etc.).
 - (e) Encouraging metering and volume-based rates, and
 - (f) Emphasizing reuse activities with high offset/recharge fractions.
- (2) Upon refining/updating the feasibility study guidelines:
- (a) Revising Chapter 62-610, F.A.C., to incorporate the new feasibility study guidelines in Rules 62-610.300, and 62-610.820, F.A.C.
- (3) If Chapter 62-40, F.A.C., revisions are adopted:
- (a) Include in feasibility study guidelines to reflect revisions,
 - (b) Revise Rule 62-610.820, F.A.C., to reflect revisions, and
 - (c) Revise Section 403.064, F.S., to reflect revisions.
- (4) Other suggestions that may merit consideration, but possibly outside of activities related specifically to reuse feasibility studies are:
- (a) Linking reuse to regional water supply plans;
 - (b) Funding coordination between DEP, water management districts, and local governments; and
 - (c) Enabling redirecting of existing reuse projects to more desirable reuse options.

Note: These may be considered as follow-up activities of the Reuse Coordinating Committee.

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Appendix A

Section 403.064, F.S. - Reuse of Reclaimed Water.

- (1) The encouragement and promotion of water conservation, and reuse of reclaimed water, as defined by the department, are state objectives and are considered to be in the public interest. The Legislature finds that the reuse of reclaimed water is a critical component of meeting the state's existing and future water supply needs while sustaining natural systems. The Legislature further finds that for those wastewater treatment plants permitted and operated under an approved reuse program by the department, the reclaimed water shall be considered environmentally acceptable and not a threat to public health and safety.
- (2) All applicants for permits to construct or operate a domestic wastewater treatment facility located within, serving a population located within, or discharging within a water resource caution area shall prepare a reuse feasibility study as part of their application for the permit. Reuse feasibility studies shall be prepared in accordance with department guidelines adopted by rule and shall include, but are not limited to:
 - (a) Evaluation of monetary costs and benefits for several levels and types of reuse.
 - (b) Evaluation of water savings if reuse is implemented.
 - (c) Evaluation of rates and fees necessary to implement reuse.
 - (d) Evaluation of environmental and water resource benefits associated with reuse.
 - (e) Evaluation of economic, environmental, and technical constraints.
 - (f) A schedule for implementation of reuse. The schedule shall consider phased implementation.
- (3) The permit applicant shall prepare a plan of study for the reuse feasibility study consistent with the reuse feasibility study guidelines adopted by department rule. The plan of study shall include detailed descriptions of applicable treatment and water supply alternatives to be evaluated and the methods of analysis to be used. The plan of study shall be submitted to the department for review and approval.
- (4) The study required under subsection (2) shall be performed by the applicant, and, if the study shows that the reuse is feasible, the applicant must give significant consideration to its implementation if the study complies with the requirements of subsections (2) and (3).
- (5) A reuse feasibility study is not required if:
 - (a) The domestic wastewater treatment facility has an existing or proposed permitted or design capacity less than 0.1 million gallons per day; or
 - (b) The permitted reuse capacity equals or exceeds the total permitted capacity of the domestic wastewater treatment facility.
- (6) A reuse feasibility study prepared under subsection (2) satisfies a water management district requirement to conduct a reuse feasibility study imposed on a local government or

utility that has responsibility for wastewater management. The data included in the study and the study's conclusions shall be given significant consideration by the applicant and the appropriate water management district in an analysis of the economic, environmental, and technical feasibility of providing reclaimed water for reuse under part II of chapter 373, and shall be presumed relevant to the determination of feasibility. A water management district shall not require a separate study when a reuse feasibility study has been completed under subsection (2).

- (7) Local governments may allow the use of reclaimed water for inside activities, including, but not limited to, toilet flushing, fire protection, and decorative water features, as well as for outdoor uses, provided the reclaimed water is from domestic wastewater treatment facilities which are permitted, constructed, and operated in accordance with department rules.
- (8) Permits issued by the department for domestic wastewater treatment facilities shall be consistent with requirements for reuse included in applicable consumptive use permits issued by the water management district, if such requirements are consistent with department rules governing reuse of reclaimed water. This subsection applies only to domestic wastewater treatment facilities which are located within, or serve a population located within, or discharge within water resource caution areas and are owned, operated, or controlled by a local government or utility which has responsibility for water supply and wastewater management.
- (9) Local governments may and are encouraged to implement programs for the reuse of reclaimed water. Nothing in this chapter shall be construed to prohibit or preempt such local reuse programs.
- (10) A local government that implements a reuse program under this section shall be allowed to allocate the costs in a reasonable manner.
- (11) Pursuant to chapter 367, the Florida Public Service Commission shall allow entities under its jurisdiction which conduct studies or implement reuse projects, including, but not limited to, any study required by subsection (2) or facilities used for reliability purposes for a reclaimed water reuse system, to recover the full, prudently incurred cost of such studies and facilities through their rate structure.
- (12) In issuing consumptive use permits, the permitting agency shall consider the local reuse program.
- (13) A local government shall require a developer, as a condition for obtaining a development order, to comply with the local reuse program.
- (14) After conducting a feasibility study under subsection (2), domestic wastewater treatment facilities that dispose of effluent by Class I deep well injection, as defined in 40 C.F.R. part 144.6(a), must implement reuse to the degree that reuse is feasible, based upon the

applicant's reuse feasibility study. Applicable permits issued by the department shall be consistent with the requirements of this subsection.

- (a) This subsection does not limit the use of a Class I deep well injection facility as backup for a reclaimed water reuse system.
- (b) This subsection applies only to domestic wastewater treatment facilities located within, serving a population located within, or discharging within a water resource caution area.

(15) After conducting a feasibility study under subsection (2), domestic wastewater treatment facilities that dispose of effluent by surface water discharges or by land application methods must implement reuse to the degree that reuse is feasible, based upon the applicant's reuse feasibility study. This subsection does not apply to surface water discharges or land application systems which are currently categorized as reuse under department rules. Applicable permits issued by the department shall be consistent with the requirements of this subsection.

- (a) This subsection does not limit the use of a surface water discharge or land application facility as backup for a reclaimed water reuse system.
- (b) This subsection applies only to domestic wastewater treatment facilities located within, serving a population located within, or discharging within a water resource caution area.

Appendix B

Rule 62-610.820, F.A.C.

- (1) Reuse feasibility studies are required by the following:
 - (a) Section 403.064, F.S., for domestic wastewater facilities located within, serving a population within, or discharging within designated water resource caution areas.
 - (b) The Indian River Lagoon system and Basin Act, contained in Chapter 90-262, Laws of Florida.
 - (c) The antidegradation policy in Rules 62-4.242 and 62-302.300, F.A.C., for new or expanded surface water discharges.
 - (d) By rules of the applicable water management district.
- (2) The applicant is encouraged to contact the appropriate district office of the Department of Environmental Protection before preparing a reuse feasibility study to discuss reuse in the area and to develop and agree upon the reuse alternatives to be evaluated in the reuse feasibility study.
- (3) Applicants meeting both of the following conditions are not required to submit reuse feasibility studies with permit applications for domestic wastewater facilities:
 - (a) The only rule or statute that requires preparation of a reuse feasibility study is Section 403.064, F.S., and
 - (b) One of the following conditions exists:
 1. The domestic wastewater treatment facility has an existing or proposed permitted capacity, whichever is larger, less than 0.1 mgd, or
 2. The permitted reuse capacity associated with the domestic wastewater treatment facility equals or exceeds the total existing or proposed permitted capacity, whichever is larger, of the domestic wastewater treatment facility.
- (4) Reuse feasibility studies required by one or more of the items listed in Rule 62-610.820(1)(a), (b), or (c), F.A.C., when being prepared by or on behalf of a local government or utility which has responsibility for domestic wastewater management, shall be prepared in accordance with Rule 62-610.300(1)(l), F.A.C.
- (5) The Department shall approve deviations or modifications from the required format or content specified in Rule 62-610.300(1)(l), F.A.C., for a reuse feasibility study, if the alternative format or study content provides the same level of evaluation as specified in Rule 62-610.300(1)(l), F.A.C. Some examples of areas of possible deviations or modifications include: alternatives to be evaluated; definitions of the levels of reuse to be evaluated; methods of evaluating rates and fees; allocation of costs to all benefited parties; consideration of other alternative investments to achieve goals (ASR, conservation, others); methods of valuing water saved, including possible adjustments for periods when water supplies are

sufficient without the reclaimed water system; and presentation formats. Multiple types of reuse may be combined to formulate alternatives for evaluation.

- (6) Reuse feasibility studies shall be signed and sealed by a professional engineer registered in Florida.
- (7) A reuse feasibility study shall be submitted as follows:
 - (a) Three copies to the appropriate Department of Environmental Protection district office.
 - (b) One copy to the appropriate water management district.
- (8) Subsection 403.064(5), F.S., states that a reuse feasibility study prepared for the Department under Subsection 403.064(2), F.S., satisfies a water management district requirement to conduct a reuse feasibility study imposed on a local government or utility that has responsibility for wastewater management. As a result, local governments or utilities located within, serving a population within, or discharging within a designated water resource caution area, which are preparing a reuse feasibility study in response to one or more of the items identified in Rules 62-610.820(1)(a), (b), or (c), F.A.C., are encouraged, but shall not be required by the Department, to do the following as part of their reuse feasibility study:
 - (a) Contact the appropriate water management district before initiation of the feasibility study to discuss water management in the area, to obtain information about the water management district's reuse priorities for the area, and to identify any additional alternatives which the water management district would like to be evaluated in the reuse feasibility study.
 - (b) If additional alternatives are identified by the water management district, the applicant is encouraged, but shall not be required by the Department, to evaluate these alternatives using the methods specified in Rule 62-610.300(1)(1), F.A.C.
- (9) Utilities interested in pursuing funding from the state revolving loan fund for reuse projects are encouraged to incorporate the results of the reuse feasibility study into the appropriate facilities plan.

History - New 4-2-90, Formerly 17-610.820; Amended 1-9-96.

Appendix C

Excerpt from the *Reuse Strategies Report*

REQUIRING WATER REUSE

Chapter 62-40, F.A.C., and Section 403.064, F.S., frame a mandatory reuse program. This section outlines the key features of the regulatory requirements for directing reuse and outlines how the program was intended to apply, as described in the *Reuse Conventions* (24), to various types of utilities and water users.

Inside Water Resource Caution Areas

Rule 62-40.416, F.A.C., requires implementation of a reasonable amount of reuse, unless reuse is not economically, technically, or environmentally feasible. This mandatory reuse program is implemented primarily through the water management districts' consumptive use permitting program. The Water Resource Caution Areas are shown in Figure 1.

Rule 62-40.416, F.A.C., allows the water management districts to limit areas within Water Resource Caution Areas that will be subject to mandatory reuse to areas where reuse is specified as a remedial or preventive action in the District Water Management Plan. Any such limitation of areas where reuse will be required must be designated by rule.

Municipalities and Utilities Having Responsibility for Water Supply and Wastewater Management - Consumptive use permits for these municipalities and utilities normally will include requirements for reuse. Reuse-related requirements may include restrictions on the quantities of water allowed to be withdrawn. This could enable limitations on water use to ensure that reclaimed water is used for appropriate beneficial purposes. Within the municipality's or utility's consumptive use permit, requirements may be placed on domestic wastewater treatment facilities having permitted or design capacities of 0.1 MGD or larger. These requirements may be relatively general in nature, perhaps taking the form "facility X shall implement a reuse system by some specified date." Requirements may be significantly more detailed and may include directives aimed at requiring implementation of specific types of reuse activities. The water management districts do not issue separate consumptive use permits to domestic wastewater facilities, which would not otherwise need a consumptive use permit, solely to add requirements for reuse. Economic, environmental, and technical factors will be considered by the water management district as part of the reasonable-beneficial use considerations.

A municipality or utility should be given a reasonable period to implement reuse, depending on the type and extent of the anticipated reuse program. Generally, a period of five to seven years should be provided from the date of the consumptive use permit until supply of reclaimed water is initiated.

As required by Section 403.064, F.S., domestic wastewater permits issued by the DEP must be consistent with requirements for reuse contained in applicable water use permits issued by the water management districts. Detailed rule provisions related to this issue are contained in Rule 62-610.800(10), F.A.C.

Municipalities and Utilities Having Responsibility for Water Supply Only - Consumptive use permits for these municipalities and utilities may include requirements for reuse. Reuse-related requirements may include restrictions on quantities of water allowed to be withdrawn. This would enable limitations on use to ensure that reclaimed water is used for appropriate beneficial purposes. Limitations may be imposed reflecting increased water use efficiency. Economic, environmental, and technical factors will be considered by the water management district as part of the reasonable-beneficial use considerations.

Individual Users of Water - Individual users of water, such as farms and golf courses, are required to use reclaimed water, unless the applicant demonstrates to the water management district's satisfaction that use of reclaimed water is not feasible, based on economic, environmental, and technical factors. The water management districts normally will make determinations concerning feasibility and the districts should not rely solely on the applicant's conclusions. If the water management district concludes that use of reclaimed water is feasible, permits are modified to require use of reclaimed water, possibly with a backup allocation in the event that reclaimed water ever ceases to be available. If reclaimed water is not currently available, consumptive use permits normally include conditions requiring the use of reclaimed water once it becomes available.

Wastewater Facilities With Consumptive Use Permits - Some domestic wastewater facilities are subject to consumptive use permitting, typically for water wells located on-site. The water management districts may include reuse requirements in the consumptive use permits for these domestic wastewater treatment facilities.

Wastewater Facilities Without Consumptive Use Permits – This section applies to domestic wastewater treatment facilities, which are not controlled by municipalities or utilities having responsibility for water supply, and which are not subject to consumptive use permitting. As noted previously, the water management districts do not issue any form of consumptive use permit to these facilities solely to impose reuse requirements.

The DEP is the sole permitting authority for these domestic wastewater facilities. The DEP will continue to discourage disposal options at these facilities. New and expanded surface water discharges will be subject to scrutiny under the Antidegradation Policy.

Pending Revisions to Chapter 62-40, F.A.C. – Pending revisions to Chapter 62-40, F.A.C., would extend the mandatory reuse provisions to apply statewide. Should these rule revisions withstand the pending challenge and be implemented, the activities outlined above as applying within designated Water Resource Caution Areas would be applied statewide.

Outside of Water Resource Caution Areas

Generally, reuse is not required outside designated Water Resource Caution Areas. The exceptions are described in the following paragraphs.

A water management district may require water users (farms, golf courses, etc.) in areas located outside of designated Water Resource Caution Areas to use reclaimed water, but only if all of the following conditions are met [Rule 62-40.416, F.A.C.]:

- (1) Reclaimed water is readily available,
- (2) Consideration is given to economic, environmental, and technical factors, and
- (3) The district has adopted rules for reuse in these areas.

The "readily available" clause was included to aid utilities implementing reuse systems. For example, this clause applies to the case where a utility has run a reclaimed water distribution line adjacent to a water user. Subject to these three criteria, the water user may be required to connect to the reuse system.

The water management districts may develop voluntary programs to encourage municipalities and utilities located outside of Water Resource Caution Areas to implement reuse programs.

Pending Revisions to Chapter 62-40, F.A.C. – Pending revisions to Chapter 62-40, F.A.C., would extend the mandatory reuse provisions to apply statewide. Should these rule revisions withstand the pending challenge and be implemented, the activities outlined above as applying outside of designated Water Resource Caution Areas would no longer be applicable.

The Antidegradation Policy

In addition, the Antidegradation Policy provides opportunities for the DEP to restrict new or expanded surface water discharges statewide. Under the Antidegradation Policy, if reuse is feasible, reuse will be preferred over a new or expanded surface water discharge.

Note: This text was taken from pages 21-23 of the *Reuse Strategies Report* (15).