

Withlacoochee Regional Water Supply Authority

Marion County Water Conservation and Reclaimed Water Initiative



July 2012

Prepared for



**WITHLACOOCHEE
REGIONAL
WATER
SUPPLY
AUTHORITY**

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1.0 Objective

The objective of the Marion County Water Conservation and Reclaimed Water Initiative (Initiative) is to assist the Withlacoochee Regional Water Supply Authority (WRWSA) members within the St. Johns River Water Management District (SJRWMD) in developing efficient and cost-effective water conservation and reclaimed water programs that lower existing and future water demands. This demand reduction will lessen the need for future water supply development and support local governments in their efforts to manage and lower per capita rates within their utilities. Water conservation is a goal of the WRWSA and is a major priority of the Authority's Regional Framework Initiative.

Initially the WRWSA proposed the review and assistance in pursuing water conservation alternatives for all authority members within its four-county area. Much of this concept was driven by the Southwest Florida Water Management District (SWFWMD) compliance per capita initiative. This initiative requires utilities to achieve demand reduction and water conservation savings that reduce per capita rates to 150 gallons per capita per day (gpcpd) or lower by December 31, 2019. This compliance initiative changed per capita rate reduction from a goal to a regulatory requirement within SWFWMD.

SWFWMD has developed a comprehensive outreach program to compliment this compliance per capita requirement to assist local governments in reaching this goal. The program includes the Cooperative Funding Initiative (CFI) in which water conservation projects are typically funded on a 50-50% cost-share; public education regarding water conservation; water conservation models; the Landscape Education Conservation Initiative; urban mobile conservation lab; and assistance with leak detection for utility systems. Based on this comprehensive outreach program the WRWSA determined it was best to focus on its members located within the SJRWMD.

The Initiative is to provide an added level of support to those communities and associated utilities within the WRWSA but outside of the SWFWMD. The initiative reviews these communities and their current conservation practices, the potential for additional conservation programs and opportunities with reclaimed water. Water conservation is a critical component of the WRWSA goals and is an important part of the WRWSA Regional Framework Initiative that has been adopted and pursued by the WRWSA Board. The WRWSA has promoted and supported water conservation through its programs and funding for a number of years.

2.0 Water Conservation Initiatives

2.1 Introduction

Marion County was a part of the original formation of the WRWSA but became "inactive" in October 1991. The County did not participate in the meetings or functions of the WRWSA and did not pay annual dues for its full membership privileges. For that period the WRWSA membership was made up of Citrus, Hernando and Sumter Counties and associated major municipalities.

Marion County regained full membership privileges with the WRWSA in October 2008. In order to become a member in good standing and, in lieu of paying past dues that were owed to the Authority, Marion agreed to financially support the update of the water supply planning process that was ongoing between WRWSA members for their area. Development of the "Water Supply Planning Compendium for the Inclusion of Marion County" (Compendium) was initiated and

completed in November 2009. This ensured that the Regional Water Supply Plan (RWSP) for WRWSA was comprehensive and included all existing and future water demands and potential sources of water to meet those needs for members.

As part of the Compendium, water conservation was promoted as a key demand management tool that would offset or at least delay the need to develop new sources. An inventory of water conservation initiatives that were being pursued by Marion County and its municipalities were cataloged and a series of qualitative recommendations were made. Conservation initiatives were analyzed in three major categories including: educational; incentive based; and regulatory.

The possibility of expanding the beneficial uses of reclaimed water was also examined. Wastewater Treatment Facilities (WWTF) within Marion County were reviewed to determine existing flows, plant flow capacities and how much treated effluent was being beneficially reused. Using projected population growth and the related need for additional wastewater treatment capacity, quantities of what reasonably could be expected for future reclaimed water flows and beneficial reuse capacities were determined.

The following sections will review the water conservation initiatives that are sponsored by the St. John's Water Management District (SJRWMD) and the WRWSA.

2.2 Conservation Initiatives Sponsored by the St. Johns River Water Management District

The SJRWMD core mission is to protect and ensure the sustainability of Florida's water resources, which includes the Floridan aquifer system and the rivers, lakes and streams within their area (floridaswater.com). To protect these resources, the SJRWMD has used water conservation as a critical strategy in protecting and ensuring the sustainability of Florida's water resources. Water conservation initiatives have been implemented by the SJRWMD to ensure that this conservation strategy is successful.

2.2.1 Water Conservation Cost-Share Program

To assist water supply utilities, local governments, and other entities in their water conservation efforts the SJRWMD has established an initiative to assist these entities with funds to complete these projects. The funds for the Water Conservation Cost-Share program are available for the following types of conservation projects:

- Implementation of water conservation best management practices (BMPs);
- Automated tracking of historical customer consumption data;
- Landscape irrigation ordinance implementation and related education efforts; and
- Other (new and innovative technology and practices).

The categories mentioned above, will be co-funded if they meet the SJRWMD's criteria for each project type. Projects implementing the water conservation BMPs must be supported by an analysis that indicates the project will result in cost-effective water savings and applicants must provide a goal-based conservation plan that meets the requirements of the SJRWMD. To assist entities in determining if their proposed project will result in cost-effective water savings, the SJRWMD had developed the Water Conservation Linear Programming Tool identifying cost-effective BMPs.

Historical billing records, mapping and work order information are tools used by many utilities to support critical operations not associated with water conservation. These tools can however be used to allow utilities to plan, monitor, target, and make corrections to meet water conservation goals. That is why funding for the improvement of systems to handle billing, mapping and work order data will only be available from the SJRWMD if the project can demonstrate how the improved data processing capabilities will be used to support water conservation.

Landscape irrigation ordinance projects must fully implement the SJRWMD rules and need to contain irrigation efficiency education efforts, to receive cost-share funds. Local governments that can meet these criteria, will have 180 days from the Governing Board authorization to fully implement a landscape ordinance and related educational efforts.

New technologies and processes may originate from water utility operations, commercial, industrial, institutional or agricultural water users. Also, advancements in other fields can receive cost-share funding, as long as they demonstrate how these advancements in new technologies, processes, and practices will be directly applied to water conservation.

The water conservation cost-share program has assisted fourteen (14) different utilities within the SJRWMD to execute water conservation projects. To date the SJRWMD has provided \$1.27 M of the total project cost of \$4.33 M for water conservation projects. Fifteen (15) additional projects have been submitted to the SJRWMD for FY2011-2012. The fifteen (15) projects are requesting \$1.55 M from the SJRWMD. The total projected cost of these conservation programs is \$5.46 M. Table 2-1 and Table 2-2 provide the breakdown by project of the currently allocated cost-share funding projects and of the proposed projects for the FY2011-2012.

2.2.2 Water Conservation Linear Programming Tool Model

The SJRWMD has developed a planning tool to better quantify the potential for water conservation for utilities within their District. It was specifically targeted to the District's 2010 Water Supply Plan as a measure in which conservation could be used to help offset the projected water demand within different planning horizons.

The development of the model essentially took three different phases. Initially, the effort relied on empirical conservation data generated on a national basis; studies conducted by the US Environmental Protection Agency (USEPA); Florida water demand reduction data; and parcel data from the FL Department of Revenue and county appraiser information. Phase II of the study utilized specific SJRWMD data to create more detailed and accurate conservation benchmarks for water use. Phase III was the actual development of the programming tool. The Linear Programming Tool (LPT) Model (Attachment A) utilizes statistical frequency distributions regarding water use instead of benchmarks. This allows better predictions of the impact of water conservation with specific utility data for each customer class. The LPT uses the data for each customer class specific to that utility and generates estimates for conservation for each 1,000 gallons of consumption to quantify the amount or potential benefit for demand reduction through conservation.

The LPT model primarily focuses on the largest utility uses such as single family and multi-family water use. At the utility level water use is established for each customer account for both indoor and outdoor water uses. Uses were then separated into customer classes including single-family; multi-family; commercial-industrial; and institutional uses. Frequency distributions were then developed for each user type by the percentage of accounts that fell within monthly usage in gallons. These distributions were averaged over five (5) representative utilities within

the SJRWMD and were tested to determine if they could be used for utilities that would not or could not provide data. It was determined that weighted average benchmarks could not accurately predict where fixture replacements needed to take place for these estimated utilities. However, for those utilities that provided data the use of customer frequency was determined to be invaluable in developing the LPT for the determination and optimization of conservation initiatives that were tailor fitted for the specific situation.

The LPT Model is utilized by the SJRWMD as a key element of “goal based water conservation planning”. LPT will give a utility the most targeted approach to the selection of conservation programs and initiatives that will provide for the greatest demand reduction and maximize public dollars. The use of this model also gives the District greater confidence in both their regulatory and non-regulatory programs that conservation initiatives will assist utilities in meeting per capita goals. Also, the use of the LPT Model as part of the SJRWMD Water Conservation Project Cost Sharing Program is critical to ensure that public dollars will achieve the intended results in water savings.

The use of the LPT Model is totally voluntary by utilities but is being highly promoted by the District. The SJRWMD staff offers technical assistance for those utilities who want use the methodology as part of their water conservation program. The District is even willing to process utility data and run the LPT Model if a utility will provide the raw data. The incentive for the District is the targeted, goal-based water conservation plan that will result in demand reduction through specific water conservation programs.

2.2.3 Goal Based Water Conservation Planning

Conservation plans that provide guidelines and documentation that supply reasonable assurance that projected conservation goals can be met are the basis of the SJRWMD Goal Based Water Conservation Planning. These conservation plans are based on an analysis of current and projected water use; system efficiency; infrastructure; operations; and management practices. They also include actions that are required to increase the efficiency of water use and delivery and the schedule and budget for implementing these initiatives.

The SJRWMD is promoting and in many cases requiring the use of Goal Based Water Conservation Plans as part of the Consumptive Use Permitting (CUP) process. Conservation plans have been required as part of the permitting process for many years, however, goal based planning requiring accountability is now the norm in this regulatory process. Utilizing water conservation programs that have a high probability of success; tying these programs to a schedule for implementation; and assuring that they are budgeted for, allows regulators to more accurately predict the impact of demand reduction strategies.

2.2.3.1 Water Conservation Planning Guide for Public Supply Utilities

A guide for public supply utilities has been provided for use in developing goal based water conservation plans by the SJRWMD (Attachment B). As the document states, “An in-depth analysis of the utility’s water use and losses is necessary to assure the plan’s effectiveness. This analysis can be performed most effectively with account-level billing data matched with user-type attributes to identify water use patterns to compare with efficient water use for each specific site”. The planning guide goes on to suggest the use of county/city property appraiser data to compile use-type information.

The Water Conservation Planning Guide assists local governments in compiling the information necessary to review comprehensively their water supply systems and make choices on how to effectively pursue programs that will affect water usage. This information includes:

1. Utility System Audit: A summary of the utility's system uses for a final accounting of system losses;
2. Leak Detection and Repair: The development of a schedule and budget to repair leaks determined from the system audit;
3. Utility Residential Water Use Profile: Data developed to better characterize end water users to be able to determine potential water savings effectiveness of different conservation techniques;
4. Water Conservation Rate Analysis: A review of the current utility rates and whether a revised structure could impact usage by end customers;
5. Water Conservation Best Management Practices (BMPs) and Measures: A review of water conservation initiatives and their cost effectiveness for reducing water usage for specific utility customers;
6. Selected Water Conservation Practices Descriptions: Descriptions of selected water conservation initiatives and the justification for selecting them;
7. Implementation Schedule and Budget: A schedule and budget for the selected water conservation initiatives by year;
8. Projected Overall Water Use and Savings Summary: A summary of projected water use with and without additional conservation;
9. Total Water Use Reduction and Cost: A summary of the total daily demand reduction that will occur over the plan's implementation period including total related costs; and
10. Annual Review and Revision: An annual update of the plan to determine implementation success and needed revisions.

2.2.3.2 Goal Based Water Conservation Plan Templates

Once the information is developed, SJRWMD has developed templates for the formation of an acceptable Water Conservation Plan. The templates contemplate utilities that will utilize the LPT Model (Attachment C) and those that will choose not to use this tool (Attachment D). The templates are an effort by the District to gain consistency in the development of these conservation plans for their regulatory programs.

- **Conserve Florida Project**

The SJRWMD participates as a partner in the Conserve Florida Project. Conserve Florida is designed to provide assistance to public water supply utilities in the development of goal-based water conservation plans. It assists in efforts to optimize water conservation programs and to quantitatively measure the success of the practices utilities implement. The Conserve Florida Clearinghouse includes the EZ Guide to conduct the analysis; a database of best management practices costs and effectiveness; a library of water conservation information; and links to additional sources of information.

Other partners in this project include Florida Department of Environmental Protection (FDEP); Florida's other four water management districts; the Florida Rural Water Association; Florida Section of the American Water Works Association; Florida Water Environment Association; and the Florida Public Service Commission. The project partners consult with technical professionals when appropriate for updates to the technical standards.

- **Local Government Technical Assistance**

Technical assistance is provided by the SJRWMD to elected officials and local government staff concerning water conservation issues and practices. Besides the development of water conservation plans, other services provided include development and adoption of local landscape and irrigation ordinances; training and technical guidance on low-impact development techniques; and review and assistance with water conservation components of comprehensive plans and plans for developments of regional impact.

- **Outreach**

Increasing public awareness of the importance of water conservation and providing information on ways that the public can conserve water is a major focal point of the SJRWMD water conservation program. Water conservation messages are disseminated through a variety of communication strategies including the news media; public service announcements; presentations to business and community groups; participation in community events; and distribution of educational materials. The SJRWMD website provides extensive information about water conservation. SJRWMD also uses social media to engage the public in water conservation through blogs, Twitter, YouTube, and iTunes.

The SJRWMD youth education program includes interactive in-school presentations; science night events; and The Great Water OdysseySM, an interactive, multidisciplinary educational tool for third-, fourth-, and fifth-graders.

- **Florida Water STARSM**

The Florida Water STAR program is a voluntary water conservation certification program for new or existing homes and commercial developments that encourages water efficiency in landscapes, irrigation systems, and indoor uses. The program has provided water efficiency standards and guidelines for household appliances, plumbing fixtures, and irrigation systems and outdoor landscapes. The program can be integrated into other green certification programs such as the Energy Star, the Florida Green Building Coalition's green standards, and the U.S. Green Council's LEED program. The Florida Star program is more detailed than the other green certifications listed above, and is relevant to Florida's unique conditions.

The Florida Water STAR program was launched in 2006 with a Silver tier for conservation in new homes. The program now also includes a Gold tier, which provides a higher standard for water efficiency, and a Bronze tier to recognize the retrofitting of existing homes for water efficiency.

The Florida Water STAR Commercial tier is designed to assist commercial water users with incorporating water conservation practices in office buildings, retail and service establishments, and other commercial buildings. Another tier, Florida Water STAR Community, is designed to assist developers with incorporating water-conserving practices into master planned communities.

As a participant of the Florida Water STAR program, the SJRWMD has also developed a professional accreditation program for landscape and irrigation professionals to provide in-depth, working knowledge of water conserving practices and the Florida Water STAR program. The program trains/tests landscape, and irrigation professionals on the design and installation of water-efficient landscapes.

- **Promotion of Florida-Friendly Landscaping™ Principles**

SJRWMD promotes Florida-Friendly Landscaping through a variety of approaches, including distribution of literature, information on the SJRWMD website, and presentations. The SJRWMD CUP program applies Florida-Friendly Landscaping principles, along with efficient irrigation practices, to calculate the amount of water that should be allocated for landscape irrigation.

- **Water Conservation Materials**

The SJRWMD offers access to their own media materials for local governments, utilities and others to use to help disseminate a clear and consistent water conservation message to the public. The materials inform the public about watering restrictions and ways to save water. Utilities, local governments and others interested in using the District's water conservation education materials can review and access these files on the District's website.

2.3 Conservation Initiatives Sponsored by the WRWSA

Water conservation is the top priority of the Withlacoochee Regional Water Supply Authority. As stated in the Authorities website (WRWSA.org). The WRWSA views water conservation as a key link between balancing current and future water needs by:

- Ensuring the needs of water supply users without compromising the ability to meet future water supply demands;
- Increasing the efficiency of water use by extending existing water supplies for new customers and by deferring increases in demand;
- Providing efficient use of potable water supplies to reduce the risk of supply deficits during a water shortage or drought; and
- Reducing energy requirements and greenhouse gas emissions, protecting air, water resources and the sustainability of environmentally sensitive lands and water resources.

The WRWSA has sponsored many conservation initiatives to achieve its goal of water conservation in the region. Two of the most current and significant include:

2.3.1 Water Conservation Coordinator Funding

Beginning in 2002, the WRWSA began the Water Conservation Coordinator Funding Initiative to ensure that the member governments within the WRWSA were properly staffed to achieve the water conservation goals set in place by different water conservation initiatives. The goal of the Water Conservation Coordinator Funding Initiative was to assist the region to comply with the SWFWMD and SJRWMD goals and requirements for demand reduction through water conservation programs.

Water Conservation Coordinators are funded for Citrus, Hernando and Marion Counties. They are county government employees whose costs are partially subsidized by the program. As county employees they are the key contacts for water conservation programs within their jurisdictions and work closely with County utility personnel to ensure that water conservation and public supply distribution are coordinated in a manner that will most effectively result in water demand reduction.

Water conservation coordinators for member governments in the WRWSA are in charge of overseeing local programs such as rebates, incentives, irrigation audits, outreach, media campaigns, education and subsidies for installing low-flow devices.

2.3.2 Irrigation Audits

Outdoor irrigation water use in the WRWSA continues to be a considerable percentage of overall water usage. In an effort to target inefficient residential family water users, the WRWSA began the Regional Irrigation Audit and Education Pilot Project. This initiative targets single-family residents within Citrus, Hernando, the portion of Marion County within the SWFWMD, and the portion of the Village Center Community Development District (VCCDD) located in Sumter County. The Regional Irrigation Audit and Education Pilot project has the specific goals of:

- Reducing the amount of water used outdoors daily by residential water customers through the promotion of Florida-friendly™ landscaping and by utilizing efficient irrigation devices, and schedules;
- Developing an education program for residential water customers to ensure long-term outdoor water conservation and water quality results;
- Modifying the practices of residential water customers with high, inefficient irrigation water use; and
- Reducing the non-point source pollution associated with inefficient irrigation.

The project provides selected single-family users with an irrigation audit performed by professionally certified irrigation auditor/contractor. Contractors were certified by the Florida Irrigation Society (FIS), Florida Nursery Growers & Landscape Association (FNGLA), or other certifying agencies which parallel the United States Environmental Protection Water Sense Program requirements for irrigation.

Participants of the program obtained evaluations and recommendations for optimizing the use of water through Florida-friendly landscaping practices and by utilizing efficient irrigation systems. The audits also provide recommendations by the certified irrigation auditor on inefficient landscaping practices and irrigation devices for optimization. Soil moisture and rain sensor devices are also provided and installed for project participants who did not have a functioning device available.

3.0 Existing Water Use within Marion County

3.1 Introduction

This chapter reviews currently permitted and estimated water use for the City of Ocala, City of Belleview, and Marion County Utilities. The Marion County Compendium (WRWSA, 2009) provided the projected water demands for utilities within Marion County, to determine the

availability of water supplies for existing and future users. The report went on to analyze the potential water supply projects to meet those water needs. This section of the report will provide the current or updated status of water supply demand for these utilities within Marion County. Table 3-1 summarizes these permits and provides data on historical, existing and projected water use for both governmental and private water utilities.

The Town of McIntosh and Reddick have not been included because the water demand projections for these towns fall within the small utility classification of the SJRWMD. Small utilities provide less than 0.1 mgd to its customer's and the expected water demand projections for the future are negligible.

3.2 Permitted Water Use

To inventory the current status of the water resources within Marion County, it is essential to review the permitted water uses within the county as well as the water demand projections that were presented in the Regional Framework Initiative. This will also assist in ascertaining the role that water conservation can play in existing and future water supply planning.

This section will review the currently permitted Marion County water users located within the SJRWMD. Permitted uses were derived from the SJRWMD regulatory data base on their e-Permitting website. A summary of this information is provided in Table 3-1, Marion County Public Supply Population and Water Demand.

City of Belleview

The City of Belleview is one of the smaller utilities that provide water in the SJRWMD portion of Marion County. The City of Belleview has a five (5) year per capita average of 77 gpcd, which is one of the lower per capita rates in the region and the reason water use within the City is minimal. The City is currently permitted to withdraw up to 2.4 mgd and its permit expires in the year 2016.

City of Ocala

The City of Ocala is the biggest water user in the SJRWMD portion of Marion County. The City has a five (5) year per capita average of 185 gpcd, and is currently permitted to withdraw up to 17.54 mgd. The City's CUP expires in the year 2027.

Marion County Utilities

Marion County Utilities within the SJRWMD is composed of multiple service areas. Each service area has a CUP for a specified quantity and expiration date. The five (5) year per capita average for Marion County Utilities within the SJRWMD is 183 gpcd. Within the SJRWMD, Marion County is currently permitted to withdraw 6.32 mgd of water for the eight service areas. Existing permit expirations range from the year 2012 through 2028.

Private Utilities

There are four (4) private utilities, with permits greater than 0.1 mgd, within the SJRWMD jurisdiction of Marion County. Private utilities within Marion County have a per capita rates ranging from 104 gpcd to 343 gpcd. These four (4) private utilities are currently permitted to

withdraw a total of 2.05 mgd, with multiple expiration dates on their permits as shown on Table 3-1.

3.3 Projected Water Use

The projected water demands for Marion County utilities located in SJRWMD are reviewed in this section. Projected uses were presented in the Marion County Compendium (WRWSA, 2009) and in the Regional Framework Initiative (WRWSA, 2012). Water demands and five (5) year average per capita rates developed in both reports were obtained from the SJRWMD Water Supply Assessment (SRJWMD, 2010).

Projections for the SJRWMD portion of Marion County were developed by multiplying the utility's 11-year average (1995-2005), gross per capita water use (in gallons per day) by its projected, served population for each of the 5-year projection periods within the planning horizon. The average gross per capita use (GPC) is defined as total water use (including residential and non-residential use) for each public supply utility divided by its served population.

Table 3-1 depicts these 11-year average per capita rates and projected water demands from 2005 – 2030 for each water supply utility in the SJRWMD portion of Marion County. The following reviews the projected demands for these utilities.

City of Belleview

As the smallest public utility providing water in the SJRWMD side of Marion County, the City of Belleview demand is expected to increase from 0.79 mgd (2005) to 1.38 mgd (2030). This is an expected increase of approximately 600,000 gpd or 75% throughout the planning horizon that was established in the Regional Framework Initiative (WRWSA, 2012).

City of Ocala

As the largest public utility providing water in the SJRWMD side of Marion County, demand in the City of Ocala is expected to increase from 9.74 mgd in 2005 to 18.60 mgd in 2030. This is an expected increase of 8.86 mgd or 91% through the planning horizon that was established in the Regional Framework Initiative (WRWSA, 2012).

Marion County Utilities

As mentioned Marion County Utilities is made up of multiple service areas. The total demand of in the SJRWMD side of Marion County is expected to increase from 5.58 mgd in 2005 to 9.12 mgd in 2030. This is an expected increase of 3.34 mgd or 63% throughout the planning horizon that was established in the Regional Framework Initiative (WRWSA, 2012).

Private Utilities

Demand for the four (4) private utilities reviewed in this report is expected to increase from 2.6 mgd to 3.38 mgd. This is an expected increase of 780,000 gpd or 30% throughout the planning horizon that was established in the Regional Framework Initiative (WRWSA, 2012).

3.4 Results

Based on the total permitted water use, and the total water demand projections for the SJRWMD portion of Marion County, the projected 2030 water demand will exceed the amount of water that is currently permitted to be withdrawn. The total amount of water permitted for the subject utilities is 28.31 mgd. The projected water demand for the SJRWMD portion of Marion County for 2030 is 32.48 mgd, or a difference of 4.17 mgd or 15%. None of the current CUP's extend past the projected demand year 2030, and it is anticipated that conservation will play a major role in meeting future water demands and will be required by the SJRWMD at permit renewal.

4.0 Water Conservation Inventory

4.1 Introduction

Water conservation was identified in the RWSPU as an essential component of water supply planning. Conservation can help manage water demands from existing and anticipated growth without requiring major capital outlays. A toolkit of conservation BMPs was compiled and an inventory of local government conservation programs was prepared in the RWSPU. These key conservation practices were evaluated, updated, compared to existing programs and recommended for consideration by local governments and are presented in Table 4-1.

The RWSPU identified three general categories of conservation BMPs:

- Regulation;
- Education; and
- Incentives.

This section includes an updated inventory of conservation BMPs in use within Marion County. These conservation measures are only inventoried with information received from the utilities, and do not go into detail regarding the effectiveness of these measures.

4.2 Regulation

The regulation category includes watering restrictions, inverted rate structures, mandatory dual lines for new development, water audits, metering programs, leak detection, prevention and repair, pressure monitoring and control, and landscape ordinances. These items are inventoried and summarized below.

City of Belleview

The City of Belleview has recently increased the cost of water in their adopted tiered rate structure for water and wastewater. This rate structure is the same for residential and commercial users; however the City of Belleview has classified water used for construction and water used for irrigation, separate from the rate structure for commercial users. The cost of construction and irrigation water is higher than the cost of water for residential and commercial users (Appendix E). The inverted rate structure has four (4) tiers for the residential and commercial water use: 0-7,999 gallons, 8,000-20,999 gallons, 21,000-30,000 gallons, and greater than 30,000 gallons.

The City currently has a landscape ordinance that requires the use of Florida Friendly landscaping (Appendix E).

The City also conducts water audits to ensure leaks are minimized in the distribution system. These water audits compare water sales, metered and estimated usages to water pumpage data. The City performs a pressure control test in the distribution line to ensure that leaks and high flow rates are avoided.

The City currently does not require new developments to install dual lines, for reclaimed water for irrigation service.

The City currently does not enforce lawn watering restrictions for the users it serves.

Town of McIntosh

The Town of McIntosh has adopted an inverted rate structure in which water rates increase for consumer uses that are higher than normal (Appendix F). The inverted rate structure has 3 tiers: 0-5,000 gallons, 5,001-10,000 gallons, and greater than 10,000 gallons.

The Town of McIntosh regularly monitors meter readings to ensure there isn't a leak in the town distribution system, and performs pressure control tests in the system to prevent leaks.

The Town of McIntosh does not enforce SJRWMD watering restrictions, and does not have a landscape ordinance requiring Florida Friendly landscaping. The town does not require that new developments install dual lines to provide reclaimed water for irrigation when it is available.

City of Ocala

The City of Ocala has adopted a tiered rate structure for their water users (Appendix G). Although the rate structure does not differentiate for the type of users, it does take into account the meter size when determining a base charge for water use. The inverted rate structure is set up in 5 tiers: 0-1,400 cubic feet, 1,401-2,000 cubic feet, 2,001-5,000 cubic feet, 5,001-10,000 cubic feet, and greater than 10,000 cubic feet.

The City currently requires that dual lines for development to provide reclaimed water for irrigation be installed within a prescribed distance of areas where existing reuse lines are available. The City also plans on constructing more reuse lines to provide other parts of the city with reclaimed water when it is available.

The City of Ocala currently enforces SJRWMD watering restrictions. The City also has a landscape ordinance requiring Florida Friendly for landscaping.

The City implemented an automatic meter reading program that detects leaks in their distribution system. This program monitors the system's pressure to avoid leaks and high flow rates in the distribution system.

Marion County

Marion County has a tiered rate structure for their water users which went into effect in the spring of 2009. Since the completion of the Marion County Compendium, the County has adopted a uniform rate structure for all of the customers within the County. The new rate

structure was effective 10/1/2011 (Appendix H). The rate structure differentiates residential, non-residential, and irrigation users and takes into account the meter size of each user for the base charge. However, only residential and irrigation water use are on a tiered rate structure. The County's inverted rate structure has five tiers: 1-6,000 gallons, 6,001-12,000 gallons, 12,001-20,000, and greater than 20,000 gallons.

Marion County currently enforces SJRWMD watering restrictions which dictate the time and days for outdoor watering. To enforce watering restrictions, the county has set up penalties for those users who violate the restrictions (Appendix G).

Marion County does not currently require reclaimed water dual lines for new developments. However many of the developments within Marion County have made concessions to add reuse distribution lines based on recommendations from the County during the entitlement process.

Marion County does not have a landscape ordinance but it does encourage the use of Florida Friendly landscaping throughout the development process.

The County currently conducts annual water audits to measure leakage in their distribution system. The County also has planned to upgrade to a fully automated meter reading system that will allow them to better monitor small leaks in the distribution system. The County currently performs pressure tests in their water system to prevent leaks.

4.3 Education Programs

Education and outreach are essential elements to a successful water conservation program. The public education categories include bill stuffers, education programs and dedicated conservation staff. Details and proposed measures are inventoried and discussed below.

City of Belleview

The City of Belleview is working with SJRWMD to develop a water conservation campaign. Its focus is to educate water customers on the importance and benefits of water conservation. The city has posted on their website ways in which citizens may reduce their water consumption. The city also provides educational packets to all new water customers on ways that they can reduce water consumption. The city also sends bill stuffers providing information on water conservation practices to its customers.

The City of Belleview currently does not have dedicated staff for water conservation.

Town of McIntosh

The Town of McIntosh has posted water conservation techniques on their website. The town has also posted links to the SJRWMD website which explain current watering restrictions.

The Town of McIntosh does not have a staff that is dedicated to water conservation. McIntosh doesn't send any educational materials or bill stuffers to their customers, and doesn't participate in any other educational or outreach activities to promote conservation.

City of Ocala

The City of Ocala is partnering with SJRWMD in its water conservation campaign. The city targets high consumption water users, and users who violate watering restrictions for outdoor watering, and informs them of conservation. The City currently has a conservation program with dedicated staff primarily focused on water and electrical conservation. The City sends educational material regarding water conservation to users.

Marion County

Marion County holds workshops for the public but also targets high water use housing developments, for these sessions, and promotes conservation during other public events.

The County has one person dedicated to water conservation. The Water Conservation Coordinator sends personal letters to water users that exceed 30,000 gallons per month. The County also has an ongoing water conservation media campaign and also uses bi-monthly bill stuffers for their water customers.

4.4 Incentives

This section inventories incentives as a conservation initiative. Incentives include toilet rebates, rain sensors and plumbing retrofit programs. The following section discusses information that was provided by the WRWSA governments on current and proposed incentive programs.

City of Belleview

The City of Belleview is not participating in any conservation incentive programs.

Town of McIntosh

The Town of McIntosh is not participating in any conservation incentive programs.

City of Ocala

The City of Ocala provides low flow shower heads, low-volume toilets, and low-flow shower heads based on funding availability.

Marion County

Marion County has participated in an Irrigation and Audit Program for the western portion of Marion County, which will continue throughout 2012. The same project is in the process of being developed for the eastern portion of Marion County, with co-operative funding from the WRWSA.

The County participated in a Toilet Rebate program funded through both SJRWMD and SWFWMD. The County will continue this program in 2012, although no funding from any water management districts has been acquired. The County will be providing conservation kits to some of its customers, and will be participating in an irrigation and landscape retrofit program.

5.0 Reclaimed Water

5.1 Introduction

Reclaimed water has become an important component of water resource management in Florida. Florida has been recognized as a national leader in water reuse. Reclaimed water is defined by FDEP as water that is beneficially reused after being treated to at least secondary wastewater treatment standards by a domestic wastewater treatment plant (WWTP). Beneficial reuse water is defined as water applied to golf courses for irrigation; residential irrigation; and other public access areas to decrease the reliance on traditional water supplies.

There are various factors considered when analyzing the percent of WWTP flows actually utilized beneficially in reclaimed water systems. High utilization rates tend to occur in more highly populated areas, such as coastal areas, where larger WWTP flows and potential reclaimed water customer bases are present.

Reclaimed water utilization is limited by seasonal supply and storage. Although WWTP flows are normally consistent, they tend to fluctuate depending on the reclaimed water utility's peak demand to supply ratio (SWFWMD, 2006). Utilities are normally limited to utilizing 50 percent of their peak flow demand to allow for higher demands that may occur, like during the dry season when irrigation demands can more than double. However, developing seasonal storage to capture and store reclaimed water available during the wet season does help increase utilization rates during high demand periods. In addition to increasing storage, supplementing the systems with other water sources such as stormwater or groundwater during peak demand seasons presents an opportunity to increase the customer base and increase annual utilization (SWFWMD, 2006).

Another important aspect of reclaimed water usage is the concept of offset. Reclaimed water offset is defined as the amount of traditional water sources (groundwater, surfacewater) that is replaced by reclaimed water usage. Customers tend to use more reclaimed water than potable water because reclaimed water is generally less expensive and is not as restricted as irrigation with potable water sources. For example, a single-family residence with an in-ground irrigation system connected to potable water uses about 300 gpd for irrigation. However, if the same single family residence converts to an un-metered, flat-rate, reclaimed water irrigation supply without day-of-week restrictions, it will use approximately three times (900 gpd) as much reclaimed water as potable water (2002 Residential Reuse in the Tri-County Area, SWFWMD 2003). In this example, the offset rate would be 33 percent (300 gpd offset for 900 gpd reclaimed water utilization).

The following sections include an inventory of the wastewater treatment facilities within Marion County that provide or have the potential to provide reclaimed water. As mentioned, reclaimed water or water that is beneficially reused after domestic wastewater treatment is an important non-potable source. Existing reclaimed water supplies were inventoried in the Marion County Compendium. The quantities that were presented were expected to offset a portion of the projected demand on traditional water supplies by making available the treated wastewater flows to applications such as golf course irrigation, residential lawn irrigation, and commercial and industrial use. This chapter further updates the information that was presented in the Marion County compendium, and projects the 2030 wastewater treatment flow for Marion County.

5.2 Existing Reuse Flows

To determine the potential future water demands that can be met by reclaimed water use in Marion County, a baseline of existing water treatment plants was presented in the Marion County Compendium. Locations of these WWTP's are depicted in Figure 5-1. Existing WWTP data were extracted from the FDEP 2010 Reuse Inventory (FDEP, 2011), and existing and projected wastewater and reuse capacities and flows are reflected on Table 5-1. FDEP only includes WWTF's that have a permitted capacity greater than 0.1 mgd so only WWTF's at or above 0.1 mgd are included in these sections.

City of Belleview

The City of Belleview has one (1) wastewater treatment facility with a permitted capacity greater than 0.1 mgd, and that provides reuse water. The City has a reuse flow of 0.35 mgd, and of that quantity, 0.19 mgd is beneficially used.

Town of McIntosh

The Town of McIntosh does not provide central wastewater treatment.

City of Ocala

The City of Ocala currently has three (3) wastewater treatment facilities that have a permitted capacity greater than 0.1 mgd, and provide reuse water. The City currently provides a reuse flow of 5.41 mgd, and of that quantity, 2.99 mgd is beneficially used.

Marion County Utilities

Marion County Utilities currently has four (4) wastewater treatment facilities within the SJRWMD jurisdiction of Marion County with a permitted capacity greater than 0.1 mgd, and that provide reuse water. From these plants the County currently provides a reuse flow of 1.36 mgd, of which according to FDEP, none is being used beneficially.

Private Utilities

There is one (1) private utility within Marion County that has a permitted capacity greater than 0.1 mgd, and provides reuse water. This utility is providing a total flow of 0.09 mgd, of which according to FDEP, none is being used beneficially.

5.3 Projected Reuse Flows

This section reviews the projected 2030 reuse flows for WWTP's within Marion County. The 2030 projected reuse flows were calculated by multiplying the percentage of population increase (between 2010 and 2030), by the 2010 WWTF flow rate, which was then added to the 2010 baseline flow to provide the 2030 WWTF projected flow rate. A 75% beneficial utilization rate was then multiplied by the projected 2030 WWTF projected flow rate to calculate an approximate availability of reclaimed water for beneficial use over the planning period. The following section reviews the information presented in Table 5-1.

City of Belleview

The City of Belleview has a 2030 projected WWTF flow of 0.60 mgd. This is a projected increase of 0.25 mgd in 2030. Based on the beneficial reuse estimate, 0.45 mgd of this reuse will be available to be used to offset public supply water demands.

Town of McIntosh

As mentioned the Town of McIntosh does not have centralized sewer available to its residents.

City of Ocala

The City of Ocala has a 2030 projected WWTF flow of 9.25 mgd. This is a projected WWTF increase of 3.84 mgd of which based on the beneficial reuse estimate 6.93 mgd of reuse will be available to offset public supply water demands.

Marion County Utilities

Marion County Utilities has a 2030 projected reuse flow of 2.32 mgd. This is a projected increase of 0.96 mgd in 2030. Based on the beneficial reuse estimate, 1.74 mgd of the reuse being provided will be available to be used beneficially to offset public supply water demands.

Private Utilities

Private utilities within Marion County have a 2030 projected reuse flow of 0.15 mgd. This is a projected increase of 0.06 mgd in 2030. Based on the beneficial reuse estimate, 0.12 mgd of the reuse being provided will be available to be used beneficially to offset public supply water demands.

5.4 Results

Cumulative WWTP flows for 2030 will be 13.18 mgd. This is an increase of 5.47 mgd. Assuming 75% beneficial utilization, this equates to a 2030 beneficial reuse quantity of 9.88 mgd. Again, this methodology assumes that all WWTP's will be utilizing 75% of all future WWTF flows. Although these estimates of beneficial use will vary these values should be used in future planning to reduce the need to develop future traditional water supplies.

6.0 Recommendations

The recommendations included in this section are an attempt to continue the dialogue between utilities and the WRWSA with regard to demand reduction in within the SJRWMD portion of Marion County. It is also directed at developing continuity between differing approaches to water conservation by the two water management districts for members within the WRWSA.

6.1 Utilities must continue their water conservation efforts to lower existing and to help minimize the impact from future water demands.

Water conservation can play a major role in accomplishing sustainable water supply planning and development for the future for those utilities within the SJRWMD portion of Marion County. This is apparent from the population projections; water demand through the 2030 planning horizon; and the utilities' current water per capita rates. Each of the utilities surveyed is actively engaged in water conservation that has led to lower per capita rates over time. It is evident that the SJRWMD has developed initiatives and outreach programs that if utilized by these utilities can further reduce existing and future water demand.

6.2 Utilities consider an internal goal of 150 gpcpd to achieve consistency throughout Marion County.

Within SWFWMD a compliance per capita rate of 150 gpcpd has been set by rule for utilities throughout the District. This per capita rate must be met by December 31, 2019 and utilities that are currently above this requirement must achieve a 50% reduction in the difference between their existing per capita and the 150 gpcpd by December 31, 2014. This regulatory requirement has and will continue to have a positive impact within SWFWMD on driving water demand down through aggressive water conservation initiatives. As determined in the WRWSA Regional Framework Initiative (December 2011), the compliance per capita rates will save approximately 22-mgd when compared to projected 2030 water demands published in the WRWSA Phase II – Detailed Water Supply Feasibility Analyses (April 2010). This did not include reductions due to compliance per capita rates for utilities within the SJRWMD. The compliance per capita rates have been declining within SWFWMD due to the requirement.

Although compliance per capita rates are not required by the SJRWMD, those utilities governed by the District should consider internal goals of per capita rate reduction with an associated schedule similar to SWFWMD requirements. This would provide consistency for those WRWSA utilities within Marion County and provide achievable targets for water demand reductions.

6.3 Participate in the Goal Based Water Conservation Planning promoted by the SJRWMD.

It has been demonstrated that water conservation can be one of the most cost effective ways to “develop” new water through demand reduction. Water conservation initiatives that are targeted at specific user groups are effective tools that can lower water usage in a meaningful and efficient manner. However, without an adequate analysis of water usage within customer base, water conservation programs can often “miss the mark” and not produce anticipated water conserving results.

The Water Conservation Linear Programming Tool (LPT) Model developed by the SJRWMD is an attempt to design water conservation programs and initiatives to customers that will be the most effective for the dollars spent. The goal is to identify water end user patterns and compare them with efficient water use for each specific site. The program requires significant data from the utility, including account-level billing data. However, the District will supply the technical support to run the model and analyze the results.

The SJRWMD is now requiring Goal Based Water Conservation Planning as part of their Consumptive Use Permitting process. The LPT model is an integral part of goal based water conservation plans and should be strongly considered by utilities even before renewal or

modifications to their CUPs. Additional information regarding goal based plans can be found in the Conserve Florida Water conservation Guide at www.conservefloridawater.org.

6.4 Utilize conservation information and demand management best management practices from both the SJRWMD and SWFWMD.

Demand management initiatives and strategies are somewhat different between the SJRWMD and SWFWMD. However, this menu of options from both Districts should be considered by Marion County utilities when developing water conservation strategies. A consistent approach by utilities throughout Marion County would help eliminate confusion by water customers on water conserving techniques and watering restrictions.

6.5 Explore options on a united water conservation outreach and education program among Marion County utilities.

Consistency in content and message for water conservation will ensure for a more effective demand management program. Marion County utilities in both water management districts should explore opportunities to collaborate on water conservation outreach and education programs. In addition to a more effective program, this collaborative approach will be a more cost-effective way to deliver the water conservation message.

6.6 Review Water Conserving Rate Structures on a regular basis for effectiveness.

One of the most effective tools for water conservation are rate structures that reward conserving water use and penalize the overuse of water monetarily. All utilities analyzed as part of this report utilize these rate structures as part of their water conservation initiatives. They are all different and tailored to meet their individual customer water uses.

The effectiveness of these rate structures should be reviewed on a regular basis. As water use habits and per capita use rates change, the impact of the billing rates can diminish. Rate analyses should be utilized to ensure that rate structures continue to provide intended water conservation savings that are intended.

6.7 Consider water billing practices that promote water conservation for customers.

Billing practices can be an effective tool for water conservation. Interaction between the utility and customers and the transfer of actual data on their water use can be an effective way to communicate both good and bad habits with regard to conservation. Examples of water conserving billing practices include:

- a. Billing that includes the usage period. This allows customers to better relate to a daily, weekly or monthly water usage rate;
- b. Billing should occur and meters read no less frequently than every other month. Customers will be able to more accurately track the reasons for either high or low water usage. Differences could be related to seasonal changes; activities in and around the home; occupancy; and other changes in water demands;
- c. Including information on the utility water rate structure in the billing cycle for better customer correlation between usage and the cost of water;

- d. Information that a customer can use to compare their water usage to other users to estimate efficient use; and
- e. Utilization of the billing process to provide other literature and information on effective water conservations measures to decrease water demand.

6.8 Continue and expand water conservation education/outreach efforts.

Education and outreach regarding water conservation should be a year round effort. Targeted outreach to existing and longtime water customers is important to manage and lower per capita rates within the utility. However it is also critical to target new residents that continue to move into the State of Florida from other regions that may not understand the need for a water conservation ethic in a seemingly wet region like Marion County.

As mentioned, water conservation material produced by the SJRWMD and SWFWMD should be considered for use by the utilities. This material can also be modified to individual utilities supplied through the billing process.

6.9 Institute mandatory reclaimed water dual line ordinances.

The future availability and access to reclaimed water will play a major role in offsetting potable water demand for non-potable purposes. Beneficial reuse will help in flattening the water demand curves for utilities and potentially push out the timelines for the development of new potable sources.

As development occurs, requirements for the installation of reclaimed water lines during the planning, permitting and construction phases of projects should be mandated. Early planning for reclaimed systems prevents the need for disruptive and costly retrofitting of areas that are already built-out.

6.10 Participation in the SJRWMD Water Conservation Cost Share Program.

Similar to the SWFWMD Cooperative Funding Initiative, the SJRWMD offers the Water Conservation Cost Share Program. Conservation projects are eligible for a 50% matching cost share. In order to participate in the funding program a commitment to water conservation must be demonstrated. This can be demonstrated in a number of ways including; water conservation ordinances; implementing goal-based water conservation plans; adoption of aggressive water conserving rate structures; and achieving and maintaining low historical per capita water use.

Goal based conservation plans can further the acceptability of funding by the District. Showing achievable benchmarks in which water conservation programs can have an impact on water demand will give SJRWMD further assurances that the cooperative funding dollars will be spent effectively.

6.11 Strong Enforcement of Watering Restrictions.

Watering restrictions were used as a drought management tool by the water management districts when hydrologic conditions required periodic reductions in water use. They were instituted and enforced to address droughts that have plagued Florida over the years. As population growth occurred, the resultant water demand on traditional water resources and the interrelationship of pumpage and impacts to environmental and water resources was better

understood, stronger demand reduction strategies were required. This included the reduction of unnecessary non-potable outdoor irrigation through year-round watering restrictions.

Year-round watering restrictions are now required by the Districts as a water conservation initiative that has targeted outdoor irrigation. Outdoor irrigation can average as high as 50% of the total water demand for a household in Florida. Enforcement of the restrictions is an essential component of the program. Enforcement is not only a compliance tool but can be an effective way to educate water users on proper irrigation techniques that not only save the utility on water demand but save the homeowner money in both water and wastewater utility bills.

Table 2-1 - SJRWMD Currently Allocated Cost - Sharing Projects

Recipient ⁽¹⁾	Project	Total Project Cost	District Funding
Approved Contracts			
Gainesville Regional Utilities	Soil Moisture Sensor Pilot Study	\$86,904	\$43,452
Home Depot USA	Rainwater and Condensate Harvesting Water Conservation Project	\$214,080	\$107,040
City of Palatka	Automated Tracking and Historical Water Consumption Project	\$134,376	\$67,188
Town of Penney Farms	Water Conservation Program	\$50,000	\$25,000
City of Sanford	Automated Meter Reading and Delivery Efficiency Program	\$490,000	\$245,000
St. Johns County	Landscape Irrigation Ordinance Enforcement Two Year Program	\$215,862	\$107,931
St. Johns County	Reliability and Performance Testing of New Landscape Irrigation Technology	\$1,180,800	\$150,000
St. Johns County	Water Conservation Initiative	\$380,119	\$50,000
Marion County	Toilet Rebate Program	\$100,000	\$50,000
Orange County Utilities	Smart Irrigation Controller Demonstration and Evaluations	\$480,000	\$100,000
Alachua County	Landscape Irrigation Code Implementation	\$31,120	\$15,560
Clay County Utility Authority	Flexnet Water Conservation Project	\$145,754	\$72,877
City of Port Orange	Flexnet Water Conservation Project	\$168,000	\$84,000
Pennbrooke HOA	Irrigation Controller Upgrade Project	\$40,000	\$20,000
		\$3,717,015	\$1,138,048
Pending Contracts			
Recipient	Project	Total Project Cost	District Funding
City of Fruitland Park	Water Conservation, Enforcement and Automation Project	\$506,306	\$75,000
Orange County Utilities	Conservation Opportunities Identification and Notification System	\$109,960	\$54,980
		\$616,266	\$129,980
Total:		\$4,333,281	\$1,268,028

(1) Data was provided by the SJRWMD.

Table 2-2 - SJRWMD Proposed Cost - Sharing Projects

Recipient ⁽¹⁾	Project	Total Project Cost	District Funding
Awarded Projectes			
City of Apopka	Potable Water Irrigation ET Controller	\$35,000	\$17,500
City of Apopka	Landscape Irrigation Ordinance	\$64,000	\$32,000
City of Apopka	Automated Tracking and Historical Consumption Data Compilation	\$79,450	\$39,725
City of Ocoee	Strategic Water Conservation Plan	\$132,367	\$66,184
City of Orange City	Targeted Conservation Through Automated Meter Reading	\$991,321	\$200,000
Seminole County	Toilet Rebate Program	\$200,000	\$100,000
City of St. Augustine	Water Use Benchmarking, Tracking, and Conservation Initiative	\$182,500	\$91,250
City of Winter Garden	AMR for Water Use Efficiency	\$750,000	\$200,000
St. Johns County	Retrofit Data Collection for Water Conservation Planning	\$130,000	\$130,000
St. Johns County	Reliability and Performance Testing of New Landscape Irrigation Technology	\$1,180,800	\$100,000
University of Florida - IFAS	Water Conserving Cold Protection Strategies for Leatherleaf Fern	\$68,750	\$68,750
Gainesville Regional Utilities	Optimization of Selected Indoor Water Conservation Retrofits	\$554,122	\$200,000
University of Florida - TREEO	Water Conservation Coordinator Training Certificate Program	\$99,990	\$30,000
City of Daytona Beach	Implementation / Conversion of Utility Builling Software	\$850,000	\$200,000
Alachua County	Landscape Irrigation Code Implementation and Education	\$139,511	\$69,755
Total:		\$5,457,811	\$1,545,164

(1) Data was provided by the SJRWMD.

Table 3-1 Marion County Public Supply Population and Water Demand Projections

Utilities Within SJRWMD ^{(1), (2)}				5-Year Per Capita Average (2005-2009)	Population Projections						Water Demand (MGD)					
	WUP #	WUP Expires	Permitted Quantities (MGD)		2005	2010	2015	2020	2025	2030	2005	2010	2015 ⁽³⁾	2020	2025	2030
Cities																
City of Ocala	50324	8/7/2027	17.54	185	52,760	66,121	75,293	84,447	93,525	102,604	9.74	12.52	13.97	15.54	16.96	18.60
City of Belleview	3137	11/7/2016	2.4	77	10,227	12,802	14,895	16,723	17,691	17,691	0.79	1.00	1.16	1.30	1.38	1.38
Marion County																
Deerpath	50381	2/9/2026	0.22	64	1,936	2,452	2,706	2,960	3,215	3,489	0.12	0.20	0.22	0.24	0.26	0.28
Raven Hill Subdivision	51172	9/30/2019	0.10	159	686	689	689	689	689	689	0.11	0.14	0.14	0.14	0.14	0.14
Silver Springs Regional Water & Sewer	4578	12/9/2028	0.64	272	1,025	1,230	1,233	1,253	1,335	1,335	0.28	0.34	0.34	0.34	0.36	0.36
Silver Springs Shores	3054	3/10/2012	2.32	76	16,908	24,849	30,348	34,081	36,010	36,010	1.29	1.60	1.74	1.83	1.91	1.91
Southoak Subdivision	51173	9/30/2019	0.21	140	953	971	974	974	974	974	0.13	0.18	0.18	0.18	0.18	0.18
Spruce Creek Golf and Country Club	399	10/9/2012	0.77	394	4,899	6,730	6,758	6,759	6,759	6,759	1.93	2.97	3.12	3.24	3.32	3.35
Spruce Creek South	82827	12/12/2026	1.09	260	2,733	2,751	2,751	2,752	2,752	2,752	0.71	0.91	0.91	0.91	0.91	0.91
Stonecrest Utilities	71676	12/12/2026	0.97	99	10,200	13,983	16,566	17,837	20,339	20,339	1.01	1.65	2.01	2.01	2.01	2.01
Private Utilities																
Aqua Utilities of Florida Inc	3043,3060, 3095,4582	9/30/2019, 2/28/2026, 4/16/2012, 6/05/2027	0.42	104	3,414	3,570	3,638	3,663	3,673	3,673	0.35	0.46	0.46	0.47	0.47	0.47
Marion Utilities Inc	3094, 3101 4580,4581	3/01/2021, 8/13/2021, 6/28/2027, 6/28/2027	0.40	153	4,979	5,043	5,058	5,074	5,089	5,089	0.76	0.77	0.77	0.77	0.78	0.78
Ocala East Villas	3016	9/4/2021	0.12	328	0	458	459	461	461	461	0.00	0.15	0.15	0.15	0.15	0.15
Sunshine Utilities	29,932,996	12/17/2021, 9/24/2018	1.11	343	4,342	4,977	5,277	5,579	5,770	5,770	1.49	1.71	1.81	1.91	1.98	1.98
The Villages of Marion ⁽³⁾				245	8,863	8,890	8,890	8,890	8,890	8,890	2.17	2.13	2.13	2.13	2.13	2.13
County Total					123,925	155,516	175,535	192,142	207,172	216,525	20.88	26.70	29.10	31.16	32.93	34.61

Notes:

1. The SJRWMD projections have not been updated since the Phase II report. The projections have been included to provide a view of the total public supply water use in the WRWSA, and to allow the comparison of water demand between the phase II demands and the new projections based on compliance per capita's.

2. The SJRWMD has not established a compliance per capita requirement for utilities within their district. Based on SJRWMD methodology, the 11 year per capita averages (1995-2005), was used to determine the water demand through the

3. This utility is owned and served by The Villages in Sumter County

Table 4-1 Conservation Program Inventory

	REGULATION								EDUCATION			INCENTIVES		
	Watering Restrictions	Inverted Rate Structure	Mandatory Dual Lines for New Development	Metering Programs	Leak detection, Prevention, and repair	Water Audits	Pressure Monitoring and Control	Landscape Ordinance/Florida Friendly Landscaping	Dedicated Staff	Bill Stuffers, Door Hangers, etc.	Education Programs	Toilet Rebates	Rain Sensors	Retrofit Packages (Aerators, Toilet Dams, Shower Heads, etc.)
Bellevue	✓	✓	✗	✓	✓	✓	✗	✓	✗	✗	✓	✗	✗	✗
McIntosh	✗	✓	✗	✓	✓	✗	✓	✗	✗	✗	✓	✗	✗	✗
Marion County	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✗	✗	✓	✓
Ocala	✓	✓	✗	✓	✓	✗	✓	✓	✓	✓	✓	✗	✗	✓
Reddick ⁽¹⁾														

✓ Indicates existing programs or programs planned to be implemented

✗ Indicates programs not currently implemented or planned

1. No conservation Measures were not available at the time of the report.

✓ In conjunction with WRWSA irrigation audit program.

Table 5-1 Existing and Projected Wastewater and Reuse Capacities and Flows

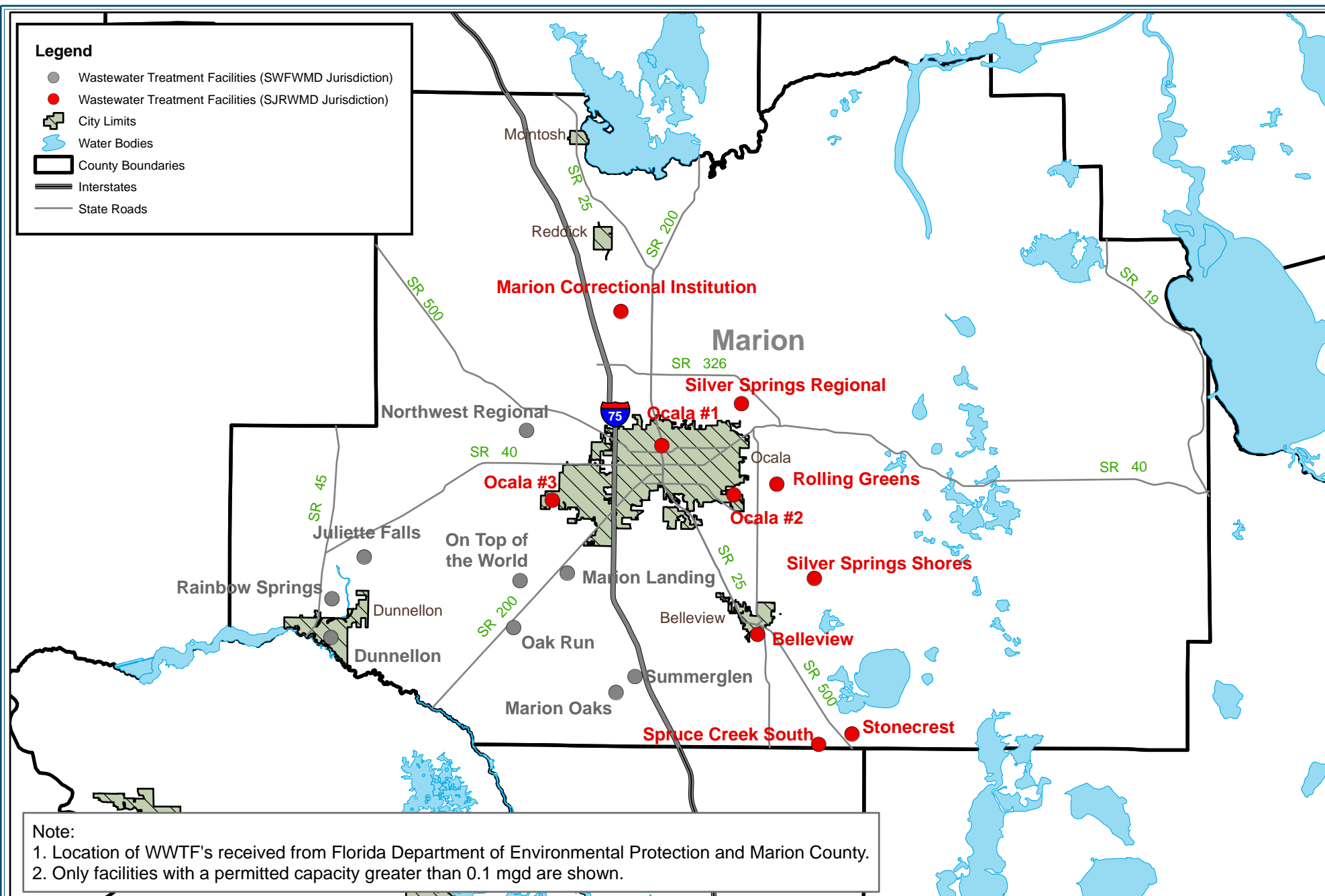
Wastewater Treatment Facilities Within SJRWMD Jurisdiction of Marion County	2010 WWTF ⁽¹⁾		2010 Reuse			2030 WWTF	2030 Reuse
	Capacity	Flow	Reuse Type	Capacity	Flow	Flow	Utilization (75%)
	(mgd)	(mgd)		(mgd)	(mgd)	(mgd)	(mgd)
Cities							
Bellevue	0.58	0.35	GCI	1.30	0.19	0.60	0.45
			OC	0.30	0.16		
Ocala # 1 WWTF	2.46	0.86	GCI	1.82	0.34	1.47	1.10
			OPAA	0.65	0.35		
Ocala # 2 WRF	6.63	2.48	GCI	0.35	0.20	4.24	3.18
			OC	5.83	2.10		
			OPAA	0.39	0.03		
			RIB	0.06	0.00		
Ocala # 3 WWTP	4.00	2.07	OPAA	4.97	2.07	3.54	2.65
Marion County							
Spruce Creek South	0.45	0.11	RIB	0.45	0.11	0.19	0.14
Stonecrest	0.23	0.18	RIB	0.23	0.18	0.31	0.23
Silver Springs Shores	1.50	0.94	OC	1.00	0.51	0.87	0.65
			RIB	0.50	0.43	0.73	0.55
Silver Springs Regional	0.45	0.13	RIB	0.45	0.13	0.22	0.17
State of Florida							
Lowell (Marion) Correctional Institution	0.65	0.50	OC	0.65	0.50	0.86	0.64
Private Utilities							
Rolling Greens	0.25	0.09	RIB	0.25	0.09	0.15	0.12
County Total	17.20	7.71		19.20	7.39	13.18	9.88

(1) Only facilities that provide reuse water and with a permitted capacity greater than 0.1 MGD are shown. Data taken from the FDEP 2010 Reuse Inventory unless otherwise indicated.

(2) Wastewater treatment facility and reuse capacities/flows provided by Marion County.

Reuse Type Abbreviations:

- GCI Golf Course Irrigation
- OC Other Crops (Spray irrigation)
- RIB Rapid Infiltration Basins
- RI Residential Irrigation
- OPAA Other Public Access Areas



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Engineering ~ Planning ~ Environmental Science
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 Fax: 813-265-6610
www.wraconsultants.com

PROJECT: 0720 - Marion Cty Water Conservation & Reclaimed Water

Figure 5-1 Existing Wastewater Treatment Facilities in Marion County

ORIGINAL DATE: 11-03-2008

REVISION DATE: 01-12-2011

JOB NUMBER: 0720

FILE NAME: WWTF's.mxd

GIS OPERATOR: DR



1 inch = 7 miles

APPENDIX A

- **SJRWMD Water Conservation Linear Programming Model**

St. Johns River Water Management District

Water Conservation Linear Programming Model

A water conservation analysis tool was developed in order to accomplish the detailed task of quantitatively measuring the potential for water conservation in the District in the 2010 Water Supply Plan. This three-phase effort relied initially on the use of National benchmark studies from AWWARF, EPA and research conducted in Florida as well as County Appraiser parcel information including Department of Revenue (DOR) codes. With collaboration from participating utilities, the study progressed to a more localized creation of District specific benchmarks of water use, using utility provided account level data. Phase III culminated in the creation of a linear programming tool and the eventual abandonment of the use of benchmarks, in favor of the use of water consumption frequency distributions. **Development of a Linear Programming Tool for Water Conservation Planning and Permitting**

District staff started the third phase of work in February 2011. Some key objectives were to obtain additional account level utility data, refine assumptions, address the recommendations from Phase II, develop alternative ways to estimate existing water use, and create a water conservation optimization tool that uses linear programming.

An alternative methodology for determining water use before conservation was developed in Phase III. Instead of using benchmarks of water use per building square foot, the new approach uses the distribution of each utility's consumption frequency for each customer class. The driving force behind this was the consumption input needed for the new linear programming tool. The new tool uses the number of accounts and opportunities for conservation at each 1,000 gallons of consumption in order to calculate conservation potential.

Single family water use methodology

Time-series consumption data is used to separate indoor and outdoor uses within each residential bin of use. The time-series consumption data allows for indoor use (the minimum month of consumption) to be separated from outdoor use (higher use months). Depending on the volume of outdoor use, accounts are classified as either irrigating using an in-ground irrigation system with automatic timers or the use of hose irrigation. This further separation is needed in order to target appropriate strategies for in-ground irrigators and hose irrigators.

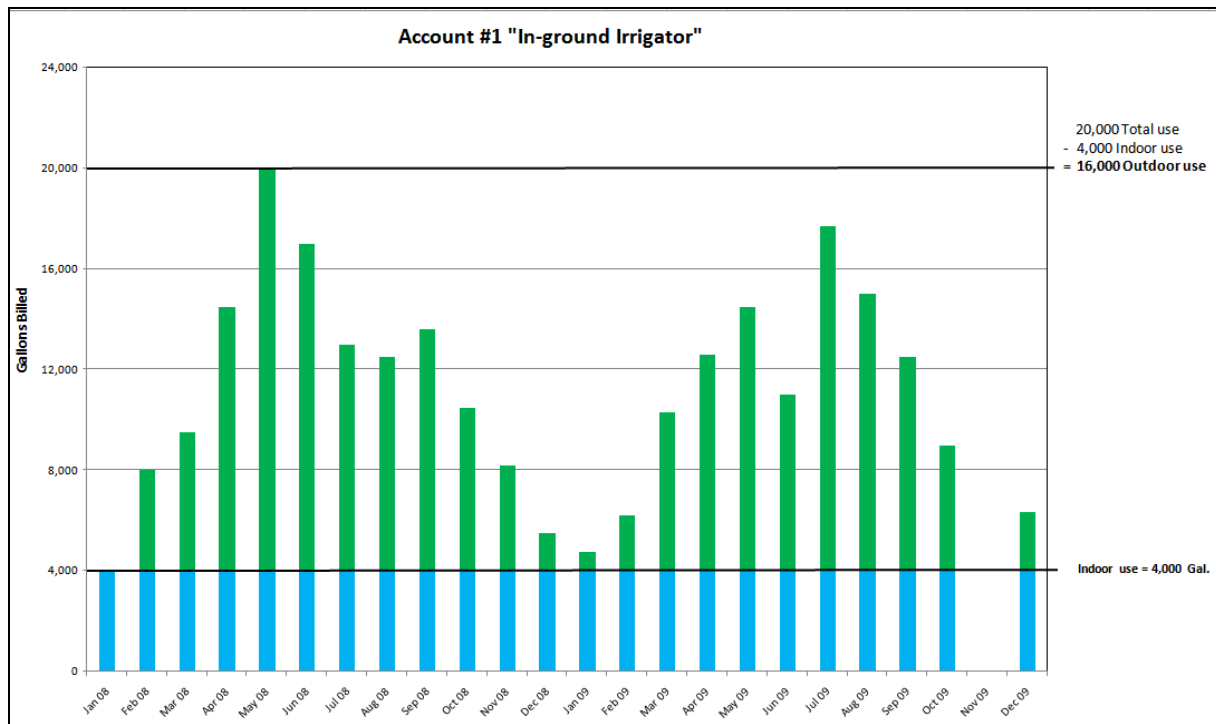


Figure 1. In-ground irrigator water use. This graph displays the method of separating indoor and outdoor use. The maximum month minus the minimum month of consumption in this case is 16 KGal. This account is classified as using an in-ground irrigation system because the maximum month minus the minimum month of nonzero consumption is greater than 10,000 gallons.

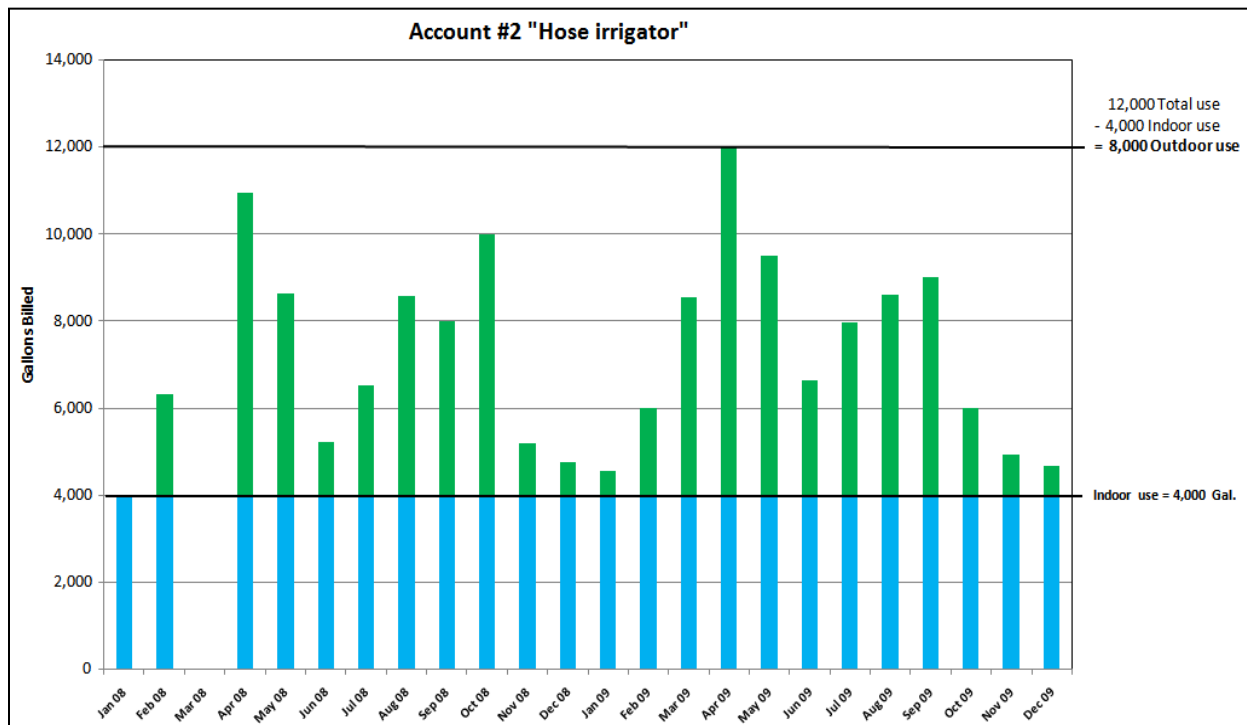


Figure 2. Hose irrigator water use. This graph represents a water use customer in which the maximum month of consumption minus the minimum month of nonzero consumption is less than 10 KGal.

Once indoor and outdoor water use were established for each account, consumption frequencies could be compiled reflecting indoor and outdoor use within each utility. The frequency analysis for each utility showed that each customer class, when disaggregated into single-family, multi-family and limited classes of commercial industrial and institutional use, was distributed consistently for all sampled utilities. From these distributions, the percent of customers at each 1,000 gallons of consumption could be calculated for each of the five utilities.

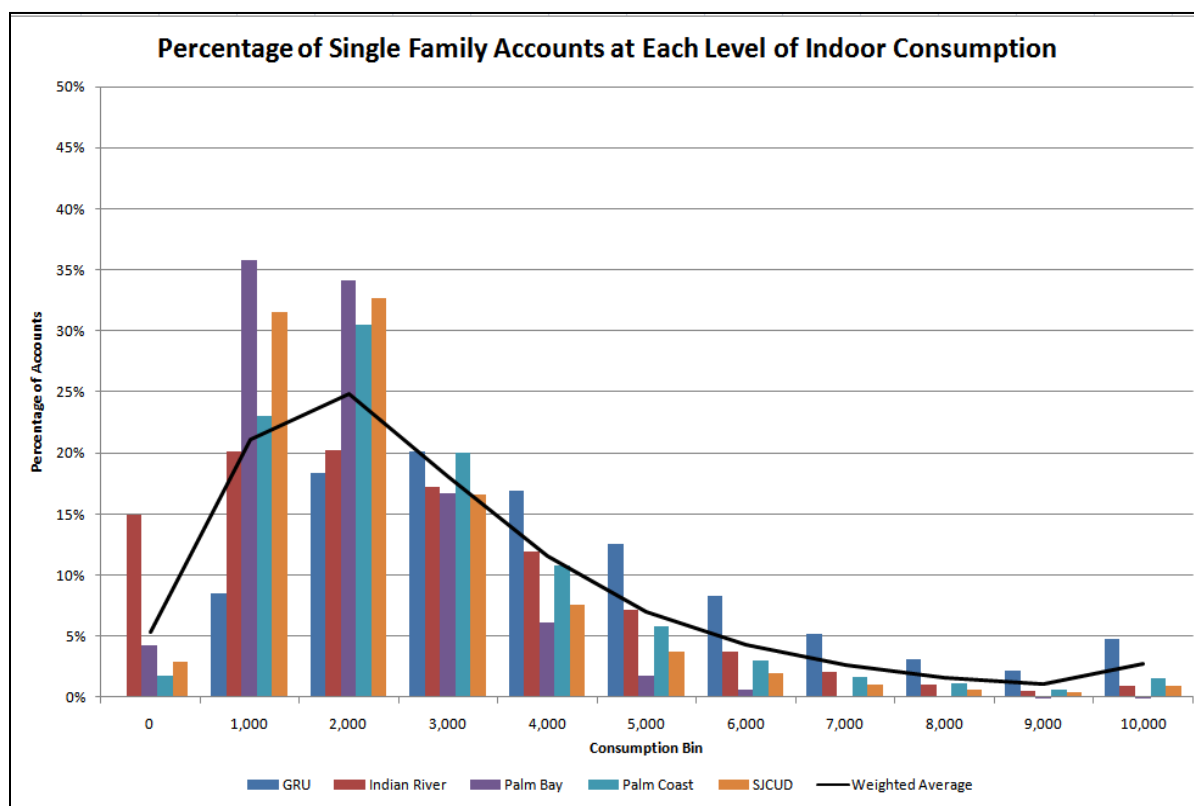


Figure 3. This figure shows the distributions of each utility's indoor use, along with their weighted average

The distributions in figure 3, expressed as the percent of customers at each 1,000 gallons of consumption per month, showed promise as a tool for estimating use in utilities which had not provided data. The five utilities' distributions were averaged and subsequently tested on a utility excluded from the weighted average. The results of this method of estimating use were compared to the results derived by the District using the weighted average benchmarks in the Phase II report. The distribution using the same parcels used in the benchmark method showed the benchmark distribution to be skewed to the left and therefore under counting the average and total amount of use. The decision was made to further investigate the possibility of using

customer water use frequency instead of the weighted average per square foot benchmarks. The trade-off in abandoning the use of weighted average benchmarks was a loss in spatial information necessary to associate fixture replacements with the parcel being considered for an implementation. Even so, the weighted benchmark averages cannot accurately predict where fixture replacements could take place. However, any shortfall due to the use of consumption frequency tables and graphs is only true for utilities whose use is being estimated. For those utilities providing account level consumption data, the use of customer frequency of use data is invaluable in developing a tool that can optimize the selection of fixtures in order to maximize savings while minimizing costs. The results are no longer mutually exclusive selections of strategies, but collectively exhaustive selections based on the lowest cost, while maximizing savings.

Consider the in-ground irrigator and hose irrigator in figures 1 and 2. Both examples use 4,000 gallons indoor per month, according to the methodology used. In the consumption frequency graph for utility X, both customers are represented in the 4,000-gallon level of use, which makes up a little over ten percent of the single-family residential customers in this utility. When considering outdoor use, the two examples fall under different levels of consumption: the in-ground irrigator falls in the sixteen KGal level of use while the hose irrigator falls in the eight KGal of use. The amount of water use separated into levels of consumption is very important when considering conservation practices because it forces us to think about water savings due to implementation as dependent on the amount of usage in each customer class at each level of KGal consumption. The amount of savings for each fixture depends on the amount of water the customer uses while the price for each fixture is fixed at each level of consumption.

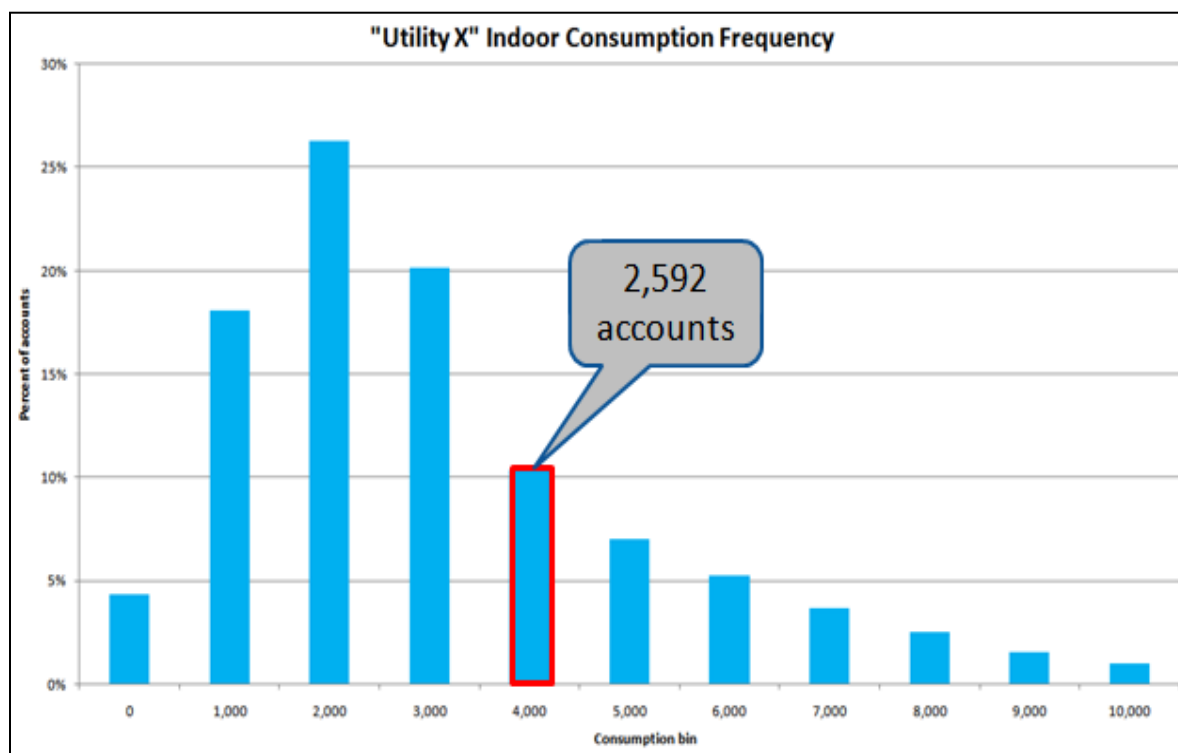


Figure 4. This graph represents the indoor consumption frequency for sample utility “X”. Both example accounts fall in the 4,000-gallon consumption bin.

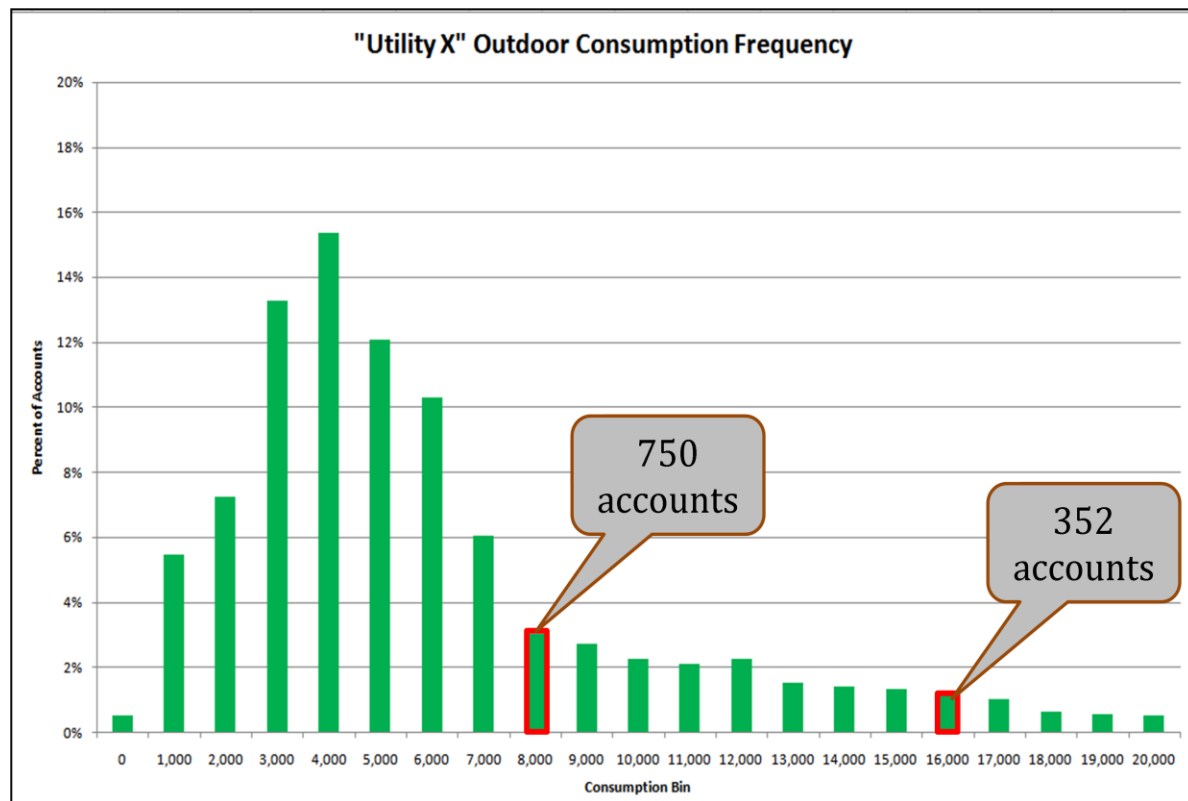


Figure 5. In this graph, the hose irrigator is one of 750 accounts using 8,000 gallons outdoor while the in-ground irrigator is one of 352 accounts using 16,000 gallons outdoor.

Multi-family water use methodology

In order to estimate water conservation potential for multi-family accounts, the consumption was linked to a single unit (apartment, condominium, etc). There were a number of challenges involved with making the account level consumption match up with the parcel information. The account level utility data for multi-family can come in two forms: individually metered or master metered. Most of the individually (sub) metered accounts were ready for analysis. A small portion of these accounts required additional processing,

The multi-family property appraiser data also needed to be screened based on the ownership and square footage in order to determine the number of units on each parcel. It is important to recognize that some multi-family units were individually owned, while in other cases the entire building or complex had one owner. In cases where units are individually owned, but the water is master-metered, the total volume was divided by the number of owners (units) in order to

get the average consumption per unit for that account. Where multi-family units did not have individual owners and the consumption data was sub-metered, it was assumed that each consumption record is one unit. In some cases, it is impossible to determine the number of multi-family units based on the square footage, owner information, or master metered consumption. These parcels and accounts were excluded from the analysis and represented a small percentage of total parcels used.

Once the number of units at each consumption level within each build-out was determined, the number of fixtures needed to be calculated. The methodology to calculate multi-family fixtures was established in Phase I. Initially, the number of bathrooms per square foot of building area was derived using multi-family parcel data from Gainesville Regional Utilities (GRU) and Vero Beach's service area boundaries. These counties' data provided estimates of bathrooms in multi-family parcels. There were discrepancies between the number of units on a parcel and the number of listed bathrooms, causing the number of bathrooms to be underestimated. Phases I and II assumed each unit contained two bathrooms and one kitchen sink.

Figure 6 shows how each combination of multi-family account and parcel data are screened and processed.

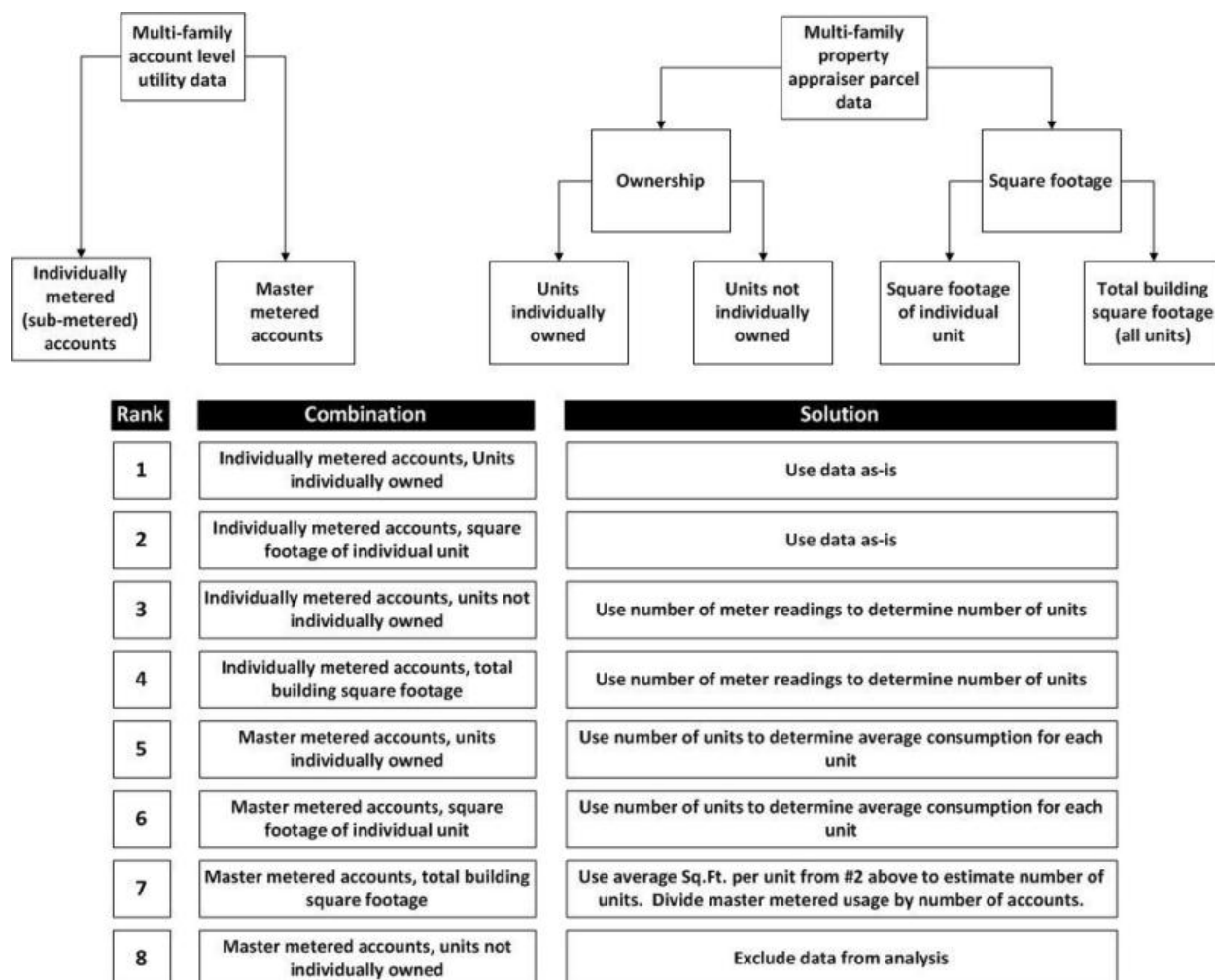


Figure 6. This diagram shows how multi-family account and parcel data are processed to generate water use per unit.

The average monthly consumption, excluding zero use months, was considered multi family use. As in the first two phases, outdoor consumption was assumed zero. Consumption was capped at 10,000 gallons, which reflects the same maximum monthly indoor use for single-family accounts. Any multi-family accounts exceeding this cap were adjusted down to 10,000 gallons in this way; no accounts were excluded from the analysis. The number of accounts and fixtures at each KGal level of consumption within each build out were totaled for use in the linear programming tool.

Single and multi family indoor water conservation savings methodology

The approach in estimating conservation potential requires the accounts be disaggregated into levels of consumption. Residential accounts are separated by year built ranges (BO1-BO4), representing three periods of plumbing standards and future construction. The customers are further disaggregated into one KGal levels of consumption within each build out. Fixture counts or replacement opportunities are calculated for the customers/accounts at each level of consumption. The total number of fixtures, or replacement opportunities, are reduced by the estimate of passive replacement per year for the best management practice (BMP), and further reduced by the saturation goal of the utility. Some important assumptions in this methodology include the following:

- End use proportions for each customer class (Residential Indoor, Hotels, Hospitals, Restaurants, etc)
- Indoor/outdoor split (Max month-min month)
- Fixture counts or replacement opportunities (Based on engineering assumptions)
- Passive replacement (Unique to each fixture, customer class, build out)
- Fixture efficiency (gpd, gpm, etc.) before and after replacement
- BMP costs

The most important of these assumptions is the end use proportions. The end use proportions affix a proportion of use to each household, which scales up or down depending on the amount of use per KGal in the home. In other words, the shower use in the home at one KGal level of use in one month is 195 gallons, while the shower use in a 10 KGal use home is 1,950 gallons per month.

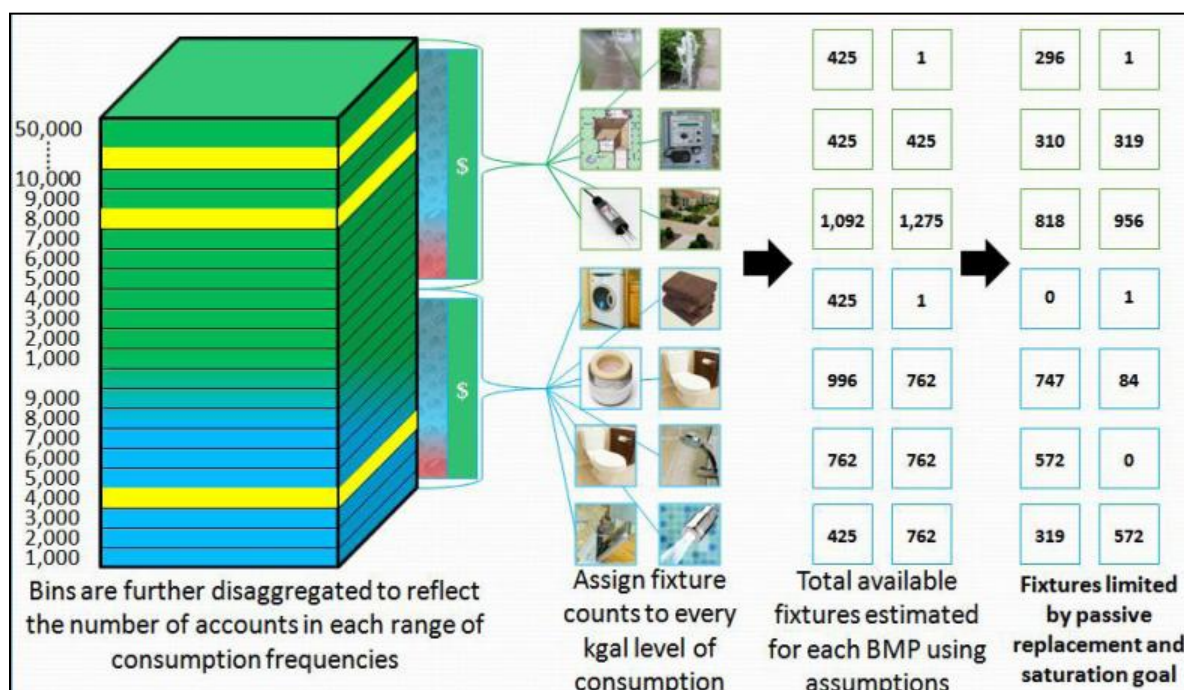


Figure 7. Water use bins developed in Phase II are disaggregated by levels of consumption (1-10 KGal for indoor; 1-50kgal for outdoor). An initial estimate of fixtures is derived and then reduced by saturation rate for the fixture and saturation goal of the utility.

Estimates of fixture counts, or replacement opportunities, are based on engineering assumptions that allow a geographic information system (GIS) program to calculate the number of fixtures on each parcel. The assumption was made that the maximum number of each type of fixture that would be replaced in a residence would be two. The logic behind this assumption is that in a home with multiple bathrooms, only two are typically used because of convenience to the residents. Once fixture counts are established for each account, the accounts are grouped by year built, then sub-grouped by indoor and outdoor consumption levels. The total number of each fixture type is preserved at this level.

The total number of fixtures available to be replaced depends on the replacement fixture's passive replacement assumption. Passive replacement refers to the rate at which a utility's customers are replacing their old fixtures with more efficient replacement fixtures currently on the market.

Each fixture replacement also has an assumed saturation rate. The saturation rate is the percent of total original fixtures that the utility is aiming to replace through program replacement. The saturation rate varies depending on the utility's specifications, based on their water conservation program experience. The saturation rate further reduces the number of replacement opportunities, or program replacements. For example, a utility establishes a saturation goal of 75% for toilet replacements. A ULF toilet BMP has a passive replacement assumption of 4% per year. If a 20-year planning horizon were used, the saturation goal would be met in year 18. This would mean zero program replacement opportunities for this particular BMP given the criteria above. Adjusting the implementation period or passive replacement assumption could allow for some program replacement opportunities.

For those BMPs with opportunities for program replacement, a percent savings is calculated based on assumptions made for the existing fixture's efficiency. The percent savings is calculated as:

$$((\text{Existing efficiency}) - (\text{BMP efficiency}))/\text{Existing Efficiency}$$

This percent savings is then applied to the proportion of water currently being used by the fixture type. For example, the assumption for toilet water use is 26.7% of all indoor water. In a 1,000-gallon indoor use per month account, that would be equal to 267 gallons. Replacing a 5-gallon toilet with a 1.2-gallon toilet would be a savings of 76%. That would equal a savings of about 201 gallons per month. In other words, the 5 gallon per flush toilet used 267 gallons per month, but after replacing it with a 1.2 gallon per flush toilet only 66 gallons would be used per month.

Single-family outdoor water conservation savings methodology

The outdoor replacement opportunities were approached in a very different way from the fixture count approach. The replacement opportunities in outdoor use cannot rely on fixture counts for the number and type of heads, due to the high degree of variability seen in the installation of in-ground irrigation systems in Florida. This issue is being addressed through extensive training of the green industry in Florida; however, the results of this approach are not evident in the irrigation systems currently installed. In order to estimate the number of replacement opportunities available in the outdoor portion of the analysis, the District relied on a study by Dukes and Olmstead, *"Frequency of Residential Irrigation Maintenance Problems"*, which surveyed approximately 3,400 in ground irrigation systems in Northeast Florida. The study used "trouble-codes" to describe the problems typically found in a large sample size of systems to be addressed in order realize savings. Those trouble codes described the level of maintenance required to deliver an amount of savings as well as the cost to provide these levels of savings. The District's approach uses the percentage of in-ground irrigators with each problem code from the Dukes and Olmstead study. The District placed the trouble codes into three groups: operation, repair, and design based audits. The results of the analysis to determine water conservation potential, and reflect the number of service calls and the cost needed to perform the services associated with each group of trouble codes. The three audits increase in complexity and cost to resolve. Where the higher levels of service are needed, the costs are assumed to include any lower levels of audit.

Code	Problem	Frequency of Occurrence	As a Percent of Homes Evaluated	As a Percent of Total Problems	Cumulative Percent of Total
10	Turf and landscape area irrigated in the same zone	2,419	70.8	11.7	11.7
20	Mixed sprinkler/emitter sizes & unmatched application rates in the same zone	2,246	65.7	10.9	22.6
40	Stream of water blocked by vegetation	2,029	59.4	9.8	32.5
52	Operating time too frequent	1,827	53.5	8.9	41.3
50	Operating time too long	1,773	51.9	8.6	49.9
32	Sprinkler heads not properly adjusted, causing overflow on paved areas	1,333	39	6.5	56.4
21	Mixed sprinkler/emitter brands or types in the same zone	1,252	36.7	6.1	62.4
53	No rain shut-off device	1,076	31.5	5.2	67.7
30	Leaks and broken valves, pipe, laterals lines (Poly-tubing), emitters, sprinklers	971	28.4	4.7	72.4
55	No irrigation water management plan	782	22.9	3.8	76.2
23	Poor overlap due to improper sprinkler/emitter alignment or spacing	729	21.3	3.5	79.7

Table 1. This table, from “*Frequency of Residential Irrigation Maintenance Problems*” (Dukes and Olmstead, 2011) gives the percentage of accounts with each problem code.

Commercial, industrial, institutional indoor water conservation savings methodology

The CII customer classes are assumed to use water only indoors. The best management practices can vary by customer class, but mainly focus on domestic use. Domestic uses include faucets, toilets, urinals, showers, and kitchen uses. Additional CII uses include things such as kitchen pre-rinse spray valves and water recycling laundry machines. The assumption for the proportion of consumption by each end use of water comes from the study East Bay Municipal Utility District (EBMUD) study: “*The WaterSmart Guidebook: A Water Use Efficiency Plan and Review Guide for New Businesses*” (EBMUD, 2008). The WaterSmart Guidebook contains sections for each major CII water-using category. Each section describes the percentage of total water applied to each end use. These percentages were used in Phase II and Phase II. EBMUD also provides several options for reducing consumption within each end use.

Water Conservation Potential Analysis: A new approach

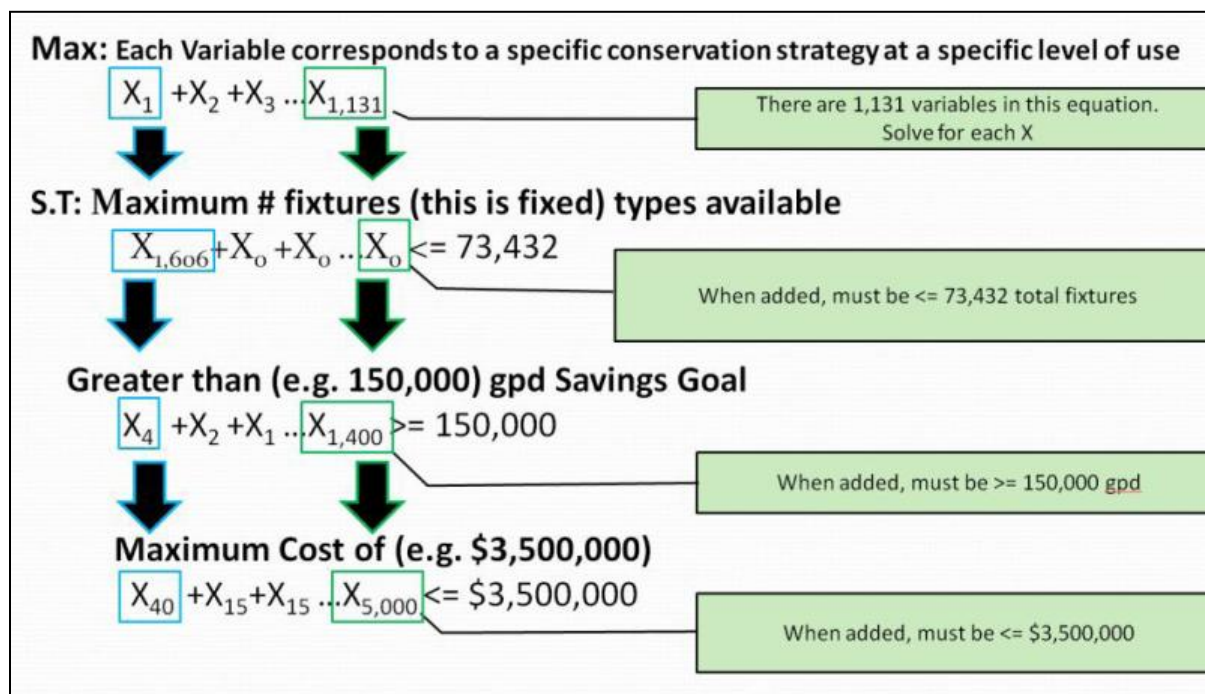


Figure 8. This figure shows how to set up a linear programming model algebraically.

A linear programming model is used to identify the most cost effective BMP implementations. For simplicity, the following example (see Figure 8) is solved for single family residential category of use for indoor and outdoor use, limited by build outs one through three. A very large equation containing 1,131 variables will be used to solve the maximum water conservation potential in this utility. Looking at the blue boxes (as in previous figures, blue shaded boxes represent indoor BMPs', while green shaded boxes indicate outdoor BMP's) from top to bottom, the first variable, X_1 , or the first of 1,131 variables is outlined. The first variable in the linear programming model represents a High Efficiency Showerhead (HE Showerhead). The second blue box, directly below, with $X_{1,606}$ indicates that according to the final adjusted fixture count developed in Phase II, there are a maximum of 1,606 HE Showerheads available to be replaced. Below that box, X_4 indicates that in terms of savings, each HE Showerhead delivers a savings of 4 gallons per day. Below that box, X_{40} represents the cost to purchase the HE showerhead is \$40 installed. There is one HE Showerhead type for each KGal level of indoor use up to the 10 KGal level of use for each build out.

The boxes shaded in green are the very last variable in the equation. The last variable $X_{1,131}$ is shaded green indicates an outdoor BMP in the BO3 category. This BMP represents replacement of turf with Florida Friendly Landscaping. There are no opportunities X_0 , to call on this strategy to deliver water conservation. The savings $X_{1,400}$ indicates that if opportunities were available for selection, it would deliver 1,400 gallons per day of savings, and comes at a cost of \$5,000 total cost at the 50KGal per month consumption level.

Note that the long equation X_1 through $X_{1,131}$ is preceded by the abbreviation for the word maximize (Max). This indicates that the equation is a maximization problem, where our goal is to maximize the amount of savings potential by selecting the combination of BMPs providing the highest savings for the dollar. The other three equations in the example are preceded by the abbreviation for subject to (S.T.). This means that the large equation we wish to solve must meet certain conditions as expressed in the three equations before the optimized number of BMPs is selected. The first equation states mathematically, that the equation for fixtures $X_{1,606}$ through X_0 , when added, cannot surpass the total number of BMPs' available. In this case, the total number of fixtures selected in the maximizing equation must be less than or equal to 73,432. The second equation containing X_4 to $X_{1,400}$ refers to the minimum amount of savings needed our desired savings goal. In other words, the sum of the savings from all selected fixtures must be greater than or equal to 150,000 gallons per day. This savings goal can be set or changed as preferred by the utility. The final equation containing $X_{\$40}$ to $X_{\$1,000}$ requires the sum of the cost of fixtures selected in the maximizing equation in terms of budget, must be less than or equal to a budget of \$3.5 M. Table 2 is an alternative way to describe the X variables outlined in the blue and green boxes in Figure 8:

Variable	Fixture Description	Number of Available Fixtures After Passive Replacement and Saturation	Gallons Saved per Day per Fixture Replacement	Cost per Fixture
X_1	HE Showerhead	1,606	4	\$40
X_2	Bathroom Faucet Aerator	0	2	\$15
X_3	Kitchen Faucet Aerator	0	1	\$15
$X_{1,131}$	Florida Friendly Landscape Replacement	0	1,400	\$5,000

Table 2. Variables X_1 through $X_{1,131}$ are shown with their available replacement opportunities, gallons per day saved, and cost per fixture. In some cases, there are no opportunities to implement certain BMPs. High passive replacement assumptions and/or a low saturation goal could be a factor.

The algebraic equation can be stated as:

Maximize:

$$X_1 + \dots X_{1,311}$$

Subject to:

$$\text{Total fixtures} \leq 73,432$$

$$\text{Total savings} \geq 150,000 \text{ gallons/day}$$

$$\text{Total cost} \leq \$3.5 \text{ Million}$$

Another way to view the linear programming process is the following:

	Monthly use (Kgal)	BMP	Cost	Savings (gal/day)	Cost effectiveness index	Savings (gal/mo)
■	1,000	HE Showerheads	\$40	4	10.00	122
■	1,000	ULF Toilet	\$300	6	50.00	183
■	1,000	HE Toilet	\$400	7	57.14	213
■	5,000	HE Showerheads	\$40	21	1.90	639
■	5,000	ULF Toilet	\$300	30	10.00	912
■	5,000	HE Toilet	\$400	33	12.12	1,004
■	10,000	HE Showerheads	\$40	41	0.98	1,247
■	10,000	ULF Toilet	\$300	60	5.00	1,825
■	10,000	HE Toilet	\$400	67	5.97	2,038

Table 3. This table illustrates how a linear program might view three identical strategies at increasing levels of consumption with a fixed savings goal and budget.

Note the HE Showerhead cost and savings assumptions at the 1, 5 and 10 KGal of use. The cost to replace each HE showerhead at each consumption level is fixed. The savings, however, increases with consumption. A cost effectiveness index was created by dividing the cost by the gallons saved. This index is simply being used as a tool, and is not an attempt to fully account for the cost of a fixture over its lifetime. The index clearly indicates the priority order in terms of HE showerheads one would select in order to obtain the most savings for the dollar spent. When the entire table is considered, those with the green filled box at a given level of consumption with a fixed budget and savings goal might be selected first, while those that are in yellow, with an appropriate budget and savings goal increase might be selected next and those in red, again with an increase in budget and savings might be selected last.

		\$/Kgal	
Maximize Savings	627,569	\$1.23	
Minimize Cost	\$3,500,000		
Constraints			
Number of Fixtures	25,549	<=	73,432
Cost	\$3,500,000	<=	\$3,500,000
Savings (gpd)	627,569	>=	150,000

Table 4. This table shows the output from the linear programming equation. Here, the savings was maximized given the thresholds for available fixtures, cost, and savings

The actual program is represented in table 4 is the “answer”, or output, of the equation in the cell labeled Maximize Savings. Under the “Constraints” column the labels for the maximum number of fixtures which can be selected must be less than or equal to 73,342, the maximum budget is \$3.5M and the stated goal for savings 150,000 gpd (right side). The amount of actual fixtures selected 25,549 at a cost of \$3.5M and a savings of 627,569 gpd. The yellow highlighted number is the unit cost (cost per KGal). This is determined by annualizing \$3.5M dollar cost over

20 years, using a discount rate of 5% and then dividing the annualized cost by the savings delivered each year. \$1.23 per KGal is very competitive in terms of water supply costs.

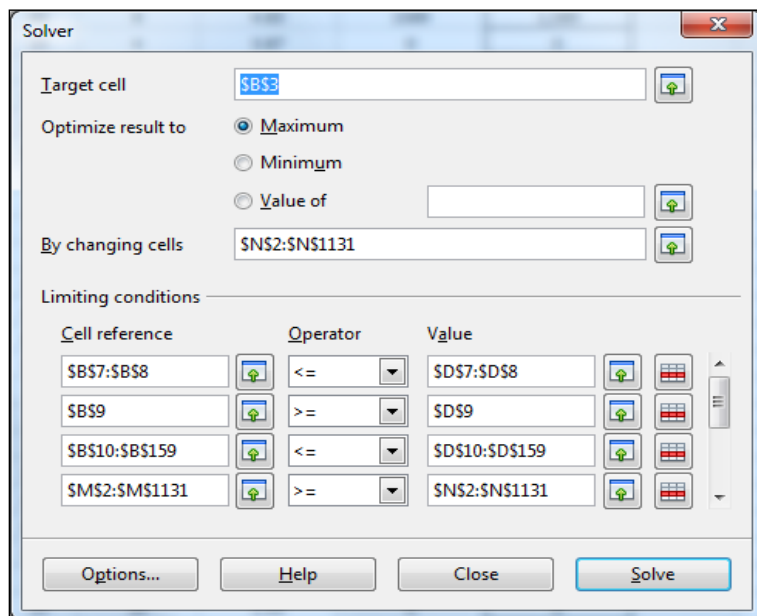


Figure 9. The target cell, changing cells, and constraints are defined in the solver set-up window.

Proper configuration of the solver is needed to run the tool successfully. The target cell, or maximized savings, is specified. The changing cells represent the variables, or number of fixtures, the linear programming process will select given the constraints. The constraints, also called “limiting conditions”, are selected in the spreadsheet. The first constraint represents the total number of replacement opportunities and the total cost. Since they have the same operator, they can be grouped into one range of cell references. The second constraint is the total savings from all BMPs selected. The third constraint limits replacements to the number of available opportunities for each fixture type and each level of consumption. The fourth constraint is what prevents some outdoor BMPs from being “double counted”. Without this constraint, the BMPs selected that are directly competing for the same end use of water could exceed the number of replacement opportunities.

Fixture ID	Consumption	Fixture Type	Number of Fixtures	Cost	Savings (GPD)	Available Fixtures	Selected Fixtures
X1	1,000	HE Shower heads	1	40	4	1606	1,606
X2		Low Flow Bathroom Faucet Aerators	1	15	2	0	0
X3		Low Flow Kitchen Faucet Aerators	1	15	1	0	0
X1131	50,000	Water-wise Florida Landscape- Outdoor	1	5,000	1,400	0	0

Table 5. This table shows how the BMPs are configured in the linear programming tool.

The settings in this particular run selected all 1,606 HE Showerhead fixtures. Notice X_1 at consumption level 1kgal are the HE showerheads with its accompanying cost, savings and available fixtures shown. X_{1131} at the 50 KGal level is Water-wise Florida Landscape- Outdoor.

None of the aerators were available for selection nor were the landscape options at the levels of consumption shown. Some were selected at higher levels of consumption in the case of aerators and lower levels of consumption in the case of landscape replacements.

Linear programming tool results

One of the advantages of setting up the linear programming tool is the ability to change the inputs to run any scenario. Figure 10 shows the cost constraint being increased by \$2M dollars of available budget for each run. This has been done for the residential indoor and outdoor for utility X below:

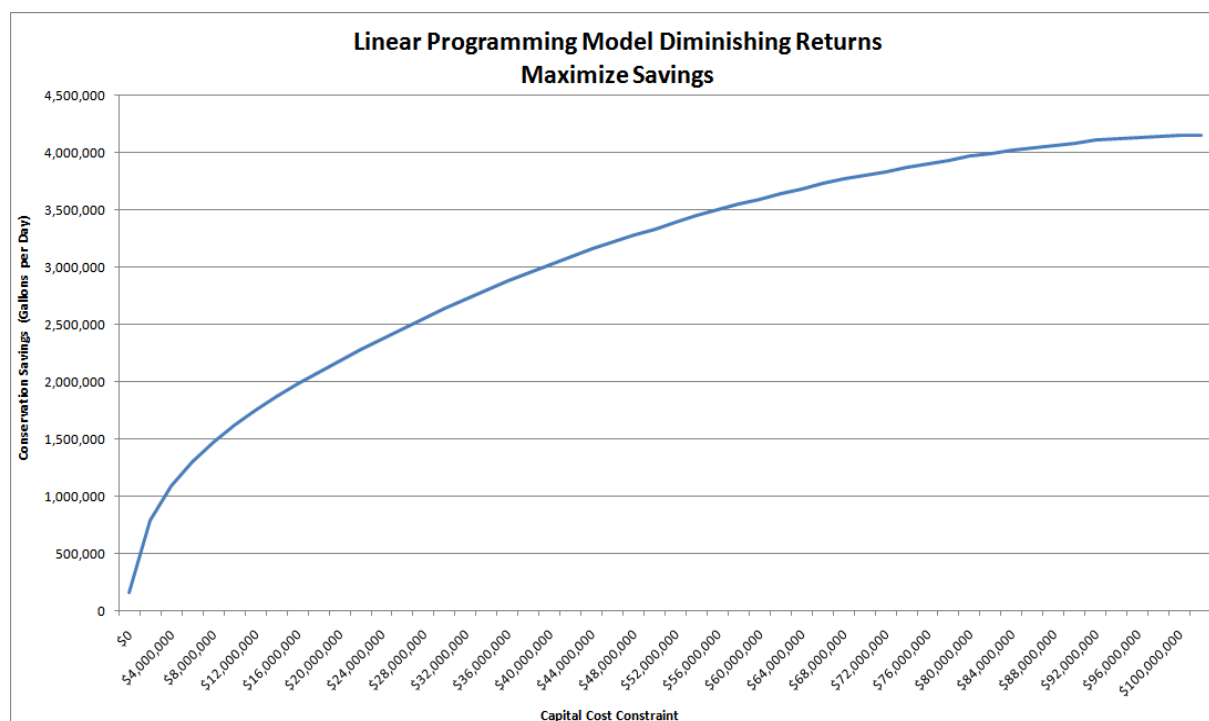


Figure 10. It is possible to illustrate a point of diminishing returns for savings at various levels of available budget. In this case, the budget was increased by \$2 million until all savings potential was reached at approximately \$76M. The output from Table 7

The unit cost for a BMP implementation is calculated as the annualized capital cost (over 20 years at a 5% discount rate) divided by the annualized water savings in thousands of gallons. This calculation results in a cost per 1,000 gallons, which can be directly compared to the production cost of alternative and traditional water supplies. A maximum unit cost can be set, which will eliminate any conservation opportunities exceeding the threshold. It is important to note that in accounts with lower consumption levels, the unit cost for any BMP will be greater than a high use account. This is the governing concept behind the linear programming tool developed in phase of work.

The most important part of the process is to ensure that the fixtures selected by the linear programming tool can be linked back to the candidate parcels at each level of consumption. A utility might choose to develop a conservation plan based on the expected costs and savings from this analysis. An operations budget and timeline will also need to be developed for a conservation plan. This work was accomplished using GIS, so a link between the linear programming tool and the parcels exists through the consumption level and build-out category. Figure 11 shows candidate parcels at the 10 KGal level of use for the 261 fixture replacements selected by the tool at that level of consumption. There may be hundreds, or even thousands, of candidate parcels utility-wide on which to implement the 261 conservation opportunities. An account's eligibility must be field verified prior to confirming that a particular 10 KGal level user is in fact a suitable candidate. This type of field verification has to occur whether or not this analysis has been done, however the decision making power of the optimization tool ensures that when these replacements are made, they represent the most savings for the least cost for the utility.



Figure 11. The results of the linear programming tool can be related back to the candidate accounts or parcels in GIS.

Using the linear programming tool

The District's linear programming tool was designed to be used by a variety of users including:

- Utilities
- Water Management District staff
- Planners
- Business leaders

- Professional associations
- Developers
- Water conservation researchers
- Water conservation companies
- Environmental groups

The linear programming tool is adaptable to whatever input data is available. The ideal data inputs for the tool are account level monthly consumption that has been linked to property appraiser parcel data. Depending on the user of the tool, only certain data or capabilities for processing the data may be available. For example, a utility director would be able join their account data to parcels and fully customize the tool to their utility. This scenario represents the best output the tool can deliver.

A student, for example, may not have the information available to the utility or may lack the capability to link the account data, and would need to use pre-loaded assumptions to use the tool.

When account level data can be joined to parcels, the accounts can easily be disaggregated by build out and consumption level. Fixture counts are totaled for each consumption level and build out, and then automatically rolled into the linear programming tool.

Where consumption data is not available, but served account locations are known, the pre-loaded weighted average consumption frequencies are applied to the parcel count. Fixture counts are automatically totaled, and the results are rolled into the linear programming tool. In these cases, assumptions must be made regarding seasonal accounts and characteristics of use.

If consumption and account location data is not available, but parcel data is, the weighted average consumption frequency for each customer class from other utilities can be applied to the parcels within a service area. From there, fixture counts at each level of consumption are generated in the tool. Assumptions must be made regarding served and unserved parcels, seasonal accounts, and characteristics of use.

APPENDIX B

- **SJRWMD Water Conservation Planning Guide**

St. Johns River Water Management District

Water Conservation Planning Guide for Public Supply Utilities

A process for preparing goal-based water conservation plans



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St. Johns River Water Management District Water Conservation Planning Guide for Public Supply Utilities

Introduction

A conservation plan is essential for a public water supply utility to assure efficient delivery and use of its product. A good public supply water conservation plan is based on analysis of current and projected water use, system efficiency, infrastructure, operations, and management practices. It describes actions to be taken to increase the efficiency with which water is transmitted and used and includes a schedule and budget for implementation of those actions. This document provides guidelines for the preparation of such a plan and describes documentation that will provide reasonable assurance that projected conservation goals can be met.

Many reasons exist for water utilities to develop and implement water conservation plans. A water conservation plan helps to optimize existing facilities and may reduce or eliminate the need to undertake new drinking water or wastewater projects. For some utilities, conservation may be sufficient to overcome projected shortfalls in supply or may delay the time when costly alternative sources will need to be developed. Water conservation also contributes to improved energy conservation.

A water conservation plan developed in accordance with these guidelines includes: a system audit; an analysis of existing water use; water use reduction goals; selection of conservation best management practices (BMPs) and measures to be implemented; timelines, and budgets. The water use reduction goals set for the water conservation plan will be unique to each utility depending on its current water use patterns, projected future demand, and system limitations. The circumstances of the utility will determine which conservation BMPs and measures are economically feasible and desirable to implement.

An in-depth analysis of the utility's water use and losses is necessary to assure the plan's effectiveness. This analysis can be performed most effectively with account-level billing data matched with user-type attributes to identify water use patterns to compare with efficient water use for each specific site. This analysis is accomplished using county property appraiser data to compile use-type information (residential, commercial, etc.), parcel size, building size, number and type of plumbing fixtures, and year of construction, to identify quantities and locations of water consumption for specific uses. Potential savings are identified where actual water use is greater than efficient use. Cost-benefit analysis is then used to determine the most economically feasible conservation BMPs to implement in that utility service area.

I. Utility System Audit - An audit of the amount of water passing through the utility's production and treatment facilities, transmission lines, and distribution system, and the amounts of finished or sold water combined with metered utility uses to determine system losses.

If the audit is being performed to meet a consumptive permitting requirement, the SJRWMD Water Audit Form 40C-22.0590-3 (Appendix C-3) must be used and the audit period must include at least 12 consecutive months within the three-year period preceding the application submittal. If the audit is not being performed to meet a permitting requirement, auditing procedures provided by the American Waterworks Association or other sources may be used. The audit must include all existing production, treatment, and distribution systems.

The audit provides a starting point for planning. Summary results of the audit should be included up front in the water conservation plan. The audit may reveal the need to implement leak detection and meter testing or change-out programs, or may uncover other opportunities to reduce water loss or unnecessary use. Other significant savings may be found by improved irrigation efficiencies for areas controlled by the utility such as for medians, athletics fields or parks, or increasing the efficiency of water use for such activities as vehicle and machinery washing. Reducing water use by improving system efficiency is valuable to a utility because it can be done without loss of revenue and may reduce operating costs.

The water conservation plan should include a summary for the audit results, providing the total quantities of water for the following items, taken from section four of the SJRWMD audit form:

- A. Total Water From Distribution System. This is a summary of all water uses within the distribution system.
- B. Total Finished Water Pumped into the Distribution System. Water pumped into the distribution system as recorded by the plant master meter.
- C. Finished Water Purchased after water treatment plant master meter. This is the total volume of purchased treated water that enters your distribution system after the plant master meter. This volume may be obtained from metered interconnections with other utilities or suppliers and is not previously accounted for in Tasks 1, 2, and 3.
- D. Sum of Finished Water going into the Distribution System. This is the sum of all water placed into the distribution system from the water treatment plant.
- E. Total Unaccounted for Water loss from Distribution System. This represents the amount of water that is not accounted for in distribution.
- F. Total Unaccounted for Water From Treatment and Distribution Systems. Represents the total difference between what was pumped and what was distributed to customers.
- G. Percentage Total Unaccounted for Water From Treatment and Distribution Systems. Shows item F as percentage of the total water produced and purchased.

II. Leak Detection and Repair – A schedule and budget for leak detection and repair activities to reduce unaccounted water to an acceptable level if it is found by the audit to exceed the desired goal.

If the water conservation plan is to be submitted as part of a consumptive use permit (CUP) application and the water audit shows greater than 10% unaccounted for water use, the applicant must complete the leak detection evaluation portion of Form 40C-22-0590-3. Based upon this evaluation, an applicant may choose to implement a leak detection program immediately or develop an alternative plan to address water use accountability and submit a new water audit to the District within two years. If the subsequent audit shows greater than 10% unaccounted for water, the applicant must implement a leak detection and repair program within one year unless the applicant demonstrates that implementation is not economically feasible. The evaluation and repair program may be terminated when the permittee demonstrates that its unaccounted for water loss no longer exceeds 10%. If the plan includes a leak detection program, the schedule and budget for the program may provided in a tabular format, such as shown in Table 1.

In some instances, it may be economically advantageous for the utility to perform leak detection and repair even if unaccounted water is considerably less than 10 percent, depending on the cost of allowing continued losses versus the cost of leak control. If the utility desires to consider this alternative, analysis must be performed to determine the economic level of leakage (ELL), i.e. at what point does it become economical to control leaks.

Table 1. Leak Detection and Repair Implementation.

Plan Year	(Base Year, Insert year) Unaccounted Water (mgd)	(Base Year, Insert year) Unaccounted Water Percentage	Projected Daily Leak Reduction (mgd)	Projected Unaccounted Water Percentage	Annual Total Cost of Leak Reduction (dollars)	Annualized Cost Per 1000 Gallons of Reduced Water Loss (dollars)
Total						

III. Utility Residential Water Use Profile - A summary of data used in the evaluation of end user water conservation potential and the effectiveness of available water conservation practices, including the water use and user characteristics.

A summary of data used in Step IV, Identifying Cost-Effective End User Water Conservation Best Management Practices (BMPs) and Measures, should be provided. The summary should include the following types of information:

- A. The number of accounts by residential use category (multifamily or single-family) and age of housing stock (pre-1984, 1984-1993, and 1994-present) broken down by number of bathrooms Table 2);
- B. Water use by major categories; (Table 3);
- C. Percentage of meters registering water use (Table 4);
- D. The number of residential connections using quantities of water in each 2,000-gallon interval (e.g., 0 to 2,000, 2,001 to 4,000, etc.) through 50,000 gallons and at 10,000 gallon intervals above that level for each source class of water (Table 5). It is recommended to use a minimum of three years of historical water use data for each of the utility's service areas.

It is not necessary to include all of the raw data in the plan. Summarized data are adequate to illustrate the basis of the analysis. The forms below generally will cover this need.

Table 2. Number of residential units by construction date and bathrooms

Residential Category	1983 and older		1984 - 1993		1994 - present	
	1 bath room	2 or more baths	1 bath room	2 or more baths	1 bath room	2 or more baths
Single-family 1 meter						
Single-family with potable irrigation meter						
Single-family with metered reuse						
Multifamily						

Table 3. System-wide total potable water use

Water Use Category	Water Use (mgd)
Single-family residential	
Multifamily residential	
Commercial/Industrial/ Institutional	
Utility and public use	
Other (If needed)	
Total	

Table 4. Percentage of meters registering water use

Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec

Table 5. Three-year average water use per month for single family residential connections, for year _____ through_____.

Water Use in Gallons per Month	Number of Connections		
	Single-family 1 meter	Single-family with potable irrigation meter	Single-family with metered reuse
0 - 2000			
2001 - 4000			
4001 - 6000			
6001 - 8000			
8001 - 10000			
10001 - 12000			
12001 - 14000			
14001 - 16000			
16001 - 18000			
18001 - 20000			
20001 - 22000			
22001 - 24000			
24001 - 26000			
26001 - 28000			
28001 - 30000			
30001 - 32000			
32001 - 34000			
34001 - 36000			
36001 - 38000			
38001 - 40000			
40001 - 42000			
42001 - 44000			
44001 - 46000			
46001 - 48000			
48001 - 50000			
50001 - 60000			
60001 - 70000			
70001 - 80000			
80001 - 90000			
90001 - 100000			
100001 and over			

***Include separate tables for potable general use water, potable irrigation meters, and non-potable sources.**

IV. Water Conservation Rate Analysis – An evaluation of whether a change in the rate structure will result in reduced consumer demand.

A water-conserving rate structure is often a cost effective means to reduce water demand. With careful analysis beforehand, rate structure adjustments can be made that maintain or increase revenue while at the same time reducing utility water demand. Florida's water management districts have developed the WateRate model for local utilities to perform a preliminary analysis to estimate effects that a change in rates will have on water demand and revenue. The output from this model can be used to determine whether further consideration of a rate modification is merited. However, the utility should not depend exclusively on the WateRate model for setting its rates. Consultation with a professional rates analyst is recommended before making any decision about implementing a new rate structure.

There is no absolute value or structure that constitutes a water conservation rate. Demand reduction may result from different levels of rates for different utilities, depending on existing rates, customer demographics, and other factors. A tiered structure is often associated with water conservation rates but the existence of rate tiers is not sufficient by itself to constitute a conservation rate structure. The absolute magnitude of the rate is of greater importance. Some utilities have tiered rates structures but their rates are too low to have much effect on demand.

The results of scenarios run on the WateRate model, or other model of the utility's choice, may be displayed in tabular format, as shown in Table 6. This table should be accompanied by a description of the tested rate scenarios, as shown in Table 7, a discussion of the model output, and a statement of any decision based on the model output.

Increasing rates will reduce water use by promoting changes in behavior and the adoption of BMPs by end users. Some of the BMPs adopted as a result of increased rates will be the same ones identified by the benefit-cost analysis and care must be taken avoid double counting the resulting water use reductions. A rate change has instant 100 percent penetration. BMPs happen one account at a time over an extended timeframe. The rate elasticity response will happen quickly and potentially ripen opportunities for further savings through BMP implementation. Therefore, it is recommended that water use reductions projected to result from a planned new rate schedule be deducted from the base system water use before the effects of planned BMP implementation are calculated, if rates are to be adjusted.

Increasing rates is a means of reducing demand from the utility system but does not always reduce overall water use. The most flagrant excessive water users often will have their own wells drilled for landscape irrigation to avoid high water prices. If this is a concern locally, the utility should give extra consideration to BMPs to improve landscape irrigation water use efficiency when a rate increase is considered.

Table 6. Alternative Rate Scenarios¹

Scenario Number	Estimated Daily Demand Under New Rate Structure (mgd)	Estimated Daily Demand Reduction from New Rate Structure (mgd)	Estimated Revenue Under New Rate Structure dollars)	Estimated Difference in Revenue Under New Rate Structure dollars)
Total				

¹Based on projected water demand of _____ and revenue of _____ under current rate structure for base year _____.

Table 7 Rate Scenarios

Scenario Number	Base Charge	Tier One Rate ¹ (Insert range of gallons at this price.)	Tier Two Rate ¹ (Insert range of gallons at this price.)	Tier Three Rate ¹ (Insert range of gallons at this price.)	Tier Four Rate ¹ (Insert range of gallons at this price.)
Total					

¹It may be necessary to modify this table layout or use more than one table if more than one set of ranges is used in the rate scenarios.

V. Identifying Cost-Effective End User Water Conservation Best Management Practices (BMPs) and Measures – An analysis to determine the most cost effective BMPs and water conservation measures to minimize water use for each publicly served use type, based on water use and site characteristics of utility customers.

The terms “BMP” and “water conservation measure” as used in these instructions are consistent with their use by the Conserve Florida Guide. BMPs are actions for which the amount of water use reduction achieved can be measured, such as plumbing fixture retrofits. Conservation measures are actions for which the amount of water use reduction achieved cannot be directly measured, such as education and program administration. Goal-based water conservation plans focus primarily on the implementation of BMPs. Reliance on BMPs allows the comparison of costs to benefits, which can be used to identify which conservation practices are the most cost-effective. However, water conservation measures, such as program administration and educational efforts to gain public acceptance, also must be added to the cost of implementing a water conservation program.

Several tools are available for performing this analysis and any of these may be used as the basis for selecting which BMPs to include in the plan. The available tools are:

1) **SJRWMD has the developed a linear programming tool** that utilizes account level utility billing data and county property appraisal data to perform a highly detailed level of analysis which provides the opportunity to most effectively target water conservation efforts and expenditures. Additional details about the SJRWMD process are provided in Appendix A. In some situations, SJRWMD may require the use of this methodology, particularly if the utility desires to use water conservation in place of alternative water supply development to assure its ability to meet future demand. SJRWMD provides data processing at no cost to any utility that elects to use its methodology.

2) **The Conserve Florida Guide**, developed by Florida’s water management districts and the Florida Department of Environmental Protection is maintained online by the University of Florida and is available at no cost to any Florida water supply utility (<http://www.conservefloridawater.org/>). Assistance in using the Guide and other information about public supply water conservation are available from the Conserve Florida Clearinghouse.

3) **The Alliance for Water Efficiency (AWE)**, a non-profit national organization maintains an online tool for calculating conservation potential for water supply utilities and provides assistance for users (<http://www.allianceforwaterefficiency.org/Tracking-Tool.aspx>). The AWE tool requires a fee for membership in AWE.

Instructions for users of the SJRWMD Linear Programming Tool

If the SJRWMD Linear Programming Tool is used to select BMPs and schedule their implementation, the utility may submit the final analysis spreadsheets showing the annual BMP implementation schedule and the planning period summary of costs and water saving and may bypass the remainder of this section and sections VI – IX, and will not be required to submit tables 8 through 12.

To use the SJRWMD tool, the utility should contact water conservation staff in the SJRWMD Bureau of Water Use Regulation who will provide guidance and assistance regarding the extraction of billing data and submission of data to SJRWMD for processing or an Excel spreadsheet which utility staff may use to perform the analysis themselves. Users of the SJRWMD tool should use the LPT Water Conservation Planning Template for preparing their plan documentation.

Instructions for users of Conserve Florida, AWE, or other processes for analyzing water conservation potential and costs

If either the Conserve Florida or the AWE tool is chosen, the next step will be to go online and follow the instructions provided for the selected tool.

The utility should base its choice of BMPs and supporting measures on the analysis of its water use and the potential for water savings and cost for each selection. The results of the cost effectiveness analysis can be presented in tabular format, as shown in Tables 8 and 9. Some BMPs will be applicable to water use associated with existing structures and some will be applicable to future projected water use in new construction. The effectiveness and total water use reduction potential of the various BMP options will vary between utilities, depending on the number and age of existing structures and the amount of future construction anticipated.

The saturation rate is an important component of calculating the water use reduction resulting from a BMP. Saturation rate is the percentage of potential users of a BMP who actually adopt it. Care must be taken to use achievable saturation rates when estimating water use reduction resulting from implementing a BMP. Some BMPs lose effectiveness over time, as hardware deteriorates or people cease to use the practice, thus reducing the saturation rate. Declines in effectiveness should be considered when multi-year estimates are made of water use reduction resulting from BMPs.

The estimated benefits, in improved water use efficiency, and the cost of implementation for available BMPs and water conservation measures may be shown in tables such as 8 for residential water use and 9 for commercial/industrial/institutional water uses.

Users of Conserve Florida, the AWE tool, or other processes should use the Non-LPT Water Conservation Planning Template for preparing their plan documentation.

Table 8. Residential water use demand reductions and costs by practice for public water supply - example BMPs.

Year	Best Management Practice														Totals for All Residential BMPS	
	High Efficiency Toilet Replacement		Install Soil Moisture Sensor Shut-off Devices		Showerhead Replacement		Irrigation System Efficiency Improvements			Land Development Regulations for Efficient Water Use		Higher Indoor Efficiency Standards	Passive Savings			
	Reduction (gpd)	Cost (\$/Kgal)	Reduction (gpd)	Cost (\$/Kgal)	Reduction (gpd)	Cost (\$/Kgal)	Reduction (gpd)	Cost (\$/Kgal)	Annual Customer O&M	Reduction (gpd)	Cost (\$/Kgal)	Reduction (gpd)	Reduction (gpd)	Total Reduction (gpd)	Total Cost \$	

Table 9. Non-residential water use demand reductions and costs by practice for public water supply - example BMPs.

Year	Best Management Practice												Passive Savings	Utility Overhead			Totals for All Non-residential BMPs	
	High Efficiency Toilet Replacement		Urinal Replacement		High Efficiency Showerhead Replacement		Commercial Kitchen Pre Rinse Spray Valve Replacement		Irrigation System Efficiency Improvements			Higher Indoor Efficiency Standards						
	Reduction (gpd)	Cost (\$/Kgal)	Reduction (gpd)	Cost (\$/Kgal)	Reduction (gpd)	Cost (\$/Kgal)	Reduction (gpd)	Cost (\$/Kgal)	Reduction (gpd)	Cost (\$/Kgal)	Annual Customer O&M	Annual Customer O&M						

VI – Description of Selected Water Conservation Practices - Descriptions of water conservation practices and measures selected for implementation and the reasons for selecting them.

A conservation plan should contain a description of each BMP and measure selected for implementation with an explanation of why each selected practice or measure should be effective for reducing the water use by one or more specific user groups. This information can be presented in narrative format. *Water Conservation Potential for the District Water Supply Plan 2010*, SJRWMD Special Publication SJ2011-SP2 is a convenient source of descriptions of BMPs and measures.

VII. Implementation Schedule and Budget - A schedule identifying when the utility will implement specific conservation practices, when the quantities of demand reduction associated with those practices will result, and a budget showing the costs of implementing each selected practice by year.

This is the key element of the plan for guiding its implementation. This section tells when rate adjustments, leak detection and repair, and each selected BMP and supporting measure will be implemented, how much money is planned to be spent on each, and how much demand reduction it should produce. It is recommended to show schedule, budget, and water use reduction together to show the connection between financial expenditures and anticipated results. This information can be shown concisely in tabular format, as illustrated in Table 10. This table shows when funds will need to be budgeted to implement components of the plan and posts the goals for planned water use reduction.

VIII. Projected Overall Water Use and Savings Summary - A concise summary of projected water use without and with additional conservation, broken down by conservation program element.

This describes the overall annual impact of the entire conservation program for the duration of the plan. This section combines the results of rate adjustments, leak detection and repair, BMP implementation, and passive savings for a water conservation program savings total and shows how much remaining demand must be met after the effects of conservation are subtracted from projected demand. Again, this information can be shown concisely in tabular format, as illustrated in Table 11.

Table 10. Annual Implementation Schedule and Budget

Plan Year 1		Planned Budget			Water use		Cost per 1000 Gallons	
Best Management Practice	Direct Cost ¹	Overhead Cost ²	Operation and Maintenance Cost ³	Existing Water Use (mgd) ⁴	Planned Water Use Reduction (mgd) ⁴	Percent Change ⁴	Initial Cost per 1000 Gallons of Reduction ⁵	Ongoing Annual Cost per 1000 Gallons of Reduction ⁵
(Insert BMPs selected for implementation.)								
"								
"								
"								
"								
"								
"								
"								
BMP Subtotal								
Passive Savings								
Rate Adjustment								
Leak Detection and Repair								
Grand Totals								

Plan Year 2 through X (Provide a copy of this table for each year covered by the plan.)

Table Notes:

1. Direct costs are for analyses, software, materials, installation, and other items required to physically implement the conservation practice.
2. Overhead costs are for administration of the program required to implement the conservation practice, such as a project manager salary.
3. Operation and maintenance costs are the ongoing annual costs of maintain the conservation practice to assure continued effectiveness.
4. Existing water use, planned water use reduction in, and percent change are for the water used only by the target water user group.
5. Costs per 1000 gallons of water use reduction are calculated from the cost and water use reductions provided in preceding columns.

Table 11. Projected Overall Water Use and Savings (mgd)

[illegible]

IX - Total Water Use Reduction and Cost - A utility-level summary of the total reduction in daily demand that will be accomplished over the plan's implementation period and total related costs.

This is a high-level summary of water conservation goals and the cost of implementing BMPs and supporting measures, in the context of historical and projected water use. This too can be presented conveniently in tabular format, such as shown in Table 12. This summary should include an estimate of passive savings, as well as that generated by the utility's water conservation program, to give a more complete picture of probable future water use. Passive savings result from a consumer replacing plumbing fixtures and water using appliances without a mandate or incentive from a utility or a governmental entity, such as when remodeling or when a fixture or appliance wears out.

Table 10 summarizes base year water use and projected future water use, the difference between the base three-year average and the projected future year, the amount by which the projected increase is expected to be offset by conservation efforts, and the remaining amount of any increase in water use that must be met from other sources, and the costs of implementing BMPs and supporting measures. In addition to providing a convenient snapshot of the overall water conservation program, this type of information is useful for assessing the need for new supply sources and the relative amount of reliance that can be placed on conservation for reducing future demand versus development of new water sources.

Table 12. Water use reduction and cost summary.

Year	Projected Water Demand for an Average Rainfall Year without Additional Conservation (mgd)	Potential Daily Demand Reduction from Conservation (mgd)	Remaining Increase in Demand to be met by Other Sources (mgd)	Total Cost of Conservation Program (dollars) ¹	Annualized Cost Per 1000 gallons of Demand Reduction (dollars) ¹
Total					

¹Includes all capital, overhead, operation and maintenance costs.

X. Annual Review and Revision - An update of portions of the plan critical for implementation.

A goal-based water conservation plan should be a dynamic document, particularly the parts related to budget and implementation. It is recommended to update at least Tables 10 and 11 annually to address unanticipated factors affecting available funding or implementation progress. This is particularly important if the utility is facing a shortfall in supply capacity that needs to be addressed by demand reduction. If the plan extends beyond a five year horizon, the analysis of water use and BMPs should be reviewed at a minimum of five-year intervals to assure continued validity. In periods of rapid inflation or deflation, or when system growth rates change unexpectedly, it may be necessary to review the entire plan annually.

APPENDIX A

INSTRUCTIONS FOR COMPLETING THE SJRWMD WATER AUDIT FORM

INTRODUCTION

All consumptive use permit applicants that are requesting water for public supply type use must complete a water audit using the District's Water Audit Form pursuant to section 12.2.5.1(a) of the Applicant's Handbook: Consumptive Uses of Water, Month, 1998. The purpose of this document is to supply instructions regarding completion of the water audit form. If the applicant should have any questions as to the completion of the water audit form, please contact the staff of the District's Division of Water Use Regulation, located at the appropriate District Service Center.

Please note, the District will require submittal of documentation supporting the applicant's water audit form when necessary.

TASK 1: TREATMENT SYSTEM

Task 1 of the water audit is designed to identify water losses in the water treatment system. Systems not monitoring raw water production will be unable to complete this section.

1A *Raw Water Produced*

Include the total volume of ground and/or surface water from withdrawal points owned and operated by you and that are used to supply your distribution system. This volume should be derived from meters located at each source prior to the water entering the treatment system.

1B *Raw Water Purchased*

Include the total volume of ground and/or surface water purchased from withdrawal points not owned or operated by you and that are used to supply or supplement your distribution system. This volume should be obtained from metered interconnections with other utilities or suppliers prior to the water entering the treatment system.

1C *Finished Water Purchased*

Include the total volume of purchased treated water that is used to supply or supplement your distribution system. This volume may be obtained from metered interconnections with other utilities or suppliers placed into the system prior to the plant master meter.

1D *Total Water Produced and Purchased*

Sum of the lines 1A through 1C.

1E *Metered Uses in Treatment*

This is metered water used during the treatment process. As an example this may include use in membrane treatment or equipment washdown.

1F *Unmetered but Known Uses in Treatment*

This is unmetered, but monitored water use during the treatment process. An example is water placed into tanker trucks.

1G *Total Water Used in Treatment*

Sum of lines 1E and 1F.

1H *Total Water produced and Purchased for Distribution*

This is the amount of water produced and purchased minus the amount of water used in treatment.

1I *Metered Finished Water Entering the Distribution System*

This is the volume of treated water entering the distribution system. This is typically read from the water treatment plant master meter.

1J *Change in Reservoir and Tank Storage*

If source meters are located up-distribution of reservoirs, storage tanks, or underground storage facilities (ASR), then the stored water must be accounted for in the audit.

NOTE:

- If the reservoirs have more water at the end of the study period than at the beginning, then the increased storage was measured by source meters, but not delivered to customers. These increases in storage must be subtracted from the metered supply.
- If there is a net reduction in storage, the decreased amount of stored water must be added to the metered supply.

1K *Total Water Unaccounted for in the Treatment Process*

This is the total unaccounted for water lost during treatment. Can be either a positive or negative amount.

TASK 2: DISTRIBUTION SYSTEM - Metered Uses

Task 2 is designed to account for water uses from the distribution system as determined by metered sales records.

2A *Small and Medium Meter Use (5/8 inch - 3 inches)*

Record monthly totals for entire study period for all meter sizes within the 5/8 - 3 inch range. Calculate total water sold for this size range of meters.

2B *Large Meter Use (greater than 3 inches)*

Record monthly totals for entire study period for all meter sizes greater than 3 inches. Calculate total water sold for this size range of meters.

2C *Adjustments due to Meter Lag Time*

Corrections should be made to metered use data when the source-meter reading dates and the customer-meter reading dates do not coincide with the beginning and ending dates of the audit study period.

Example: Adjusting for one meter route

A utility is studying one calendar year, 1/1 - 12/31.

Source meters are read on the 1st day of each month

Customers' meters are read on the tenth day of each month

Calculate the amount of water supplied and consumed for the calendar year

Source Meters. - no correction is made for source meters because their reading usually occurs on the days that the study period begins and ends. If the last reading (12/31 was a day late (1/1), the water supplied for 1/1 should be subtracted from the total water used.

Customer Meters. - since the readings do not coincide neatly with the study period, a correction must be made. To account for changes in the number of customers and in use patterns is to prorate the water use for the first and last billing periods within the study period.

2D *Sum of Lines 2A-2C*

Total of metered sales for audit period.

TASK 3: DISTRIBUTION SYSTEM - Metered Uses Not Covered in TASK 2 and Unmetered Uses

Task 3 documents miscellaneous system uses not addressed in Task 2. Items 3A-3K list common miscellaneous uses found in a typical public supply system. Item 3K provides spaces for additional uses not listed. Items 3A-3K may represent a very small component in the overall water use or records documenting the use may not be available to estimate use. In these instances, including an estimate of use may not be useful and the negligible box should be checked.

It is recommended that all uses be metered to improve accountability even if the customer is not billed for the use.

If the water use in items 3A-3K represents a significant portion of the overall use and can be reasonably documented, provide an estimate and indicate how the estimate was determined. No method is more accurate than direct metering, however, the following are common procedures for estimating usage:

3A - 3J Miscellaneous Water Uses - Procedures for Estimating Usage

1. Batch Procedure

When water is transported in a tank truck or container of some sort, use the batch procedure.

- Multiply the volume of the tank or other container by the number of times it is filled from the distribution system. This yields the volume of water delivered from the distribution system. For future estimating, it is essential that you provide reporting forms and procedures to your known batch users (ie, fire depts., construction or road crews etc.).

Examples:

Fire fighting and Training

To estimate this use, check fire department records on training, flushing, and fire suppression. Many fire departments use more water for training and hydrant flushing than for fighting fires. Fire Departments should keep records of hydrant flushing (flow rate and duration), fire calls (duration of fire), tanker fills.

In preparation for future audits, all fire departments should be supplied with adequate water use recording forms and meters for hydrant flushing.

Street Cleaning

Water used to clean roadways, parking lots, boat ramps, bus stops and bike paths.

- Use the batch method

1. Find out the number of trucks or other equipment used daily and each vehicles water holding capacity.
2. Calculate number of days used during study period
3. Calculate number of times filled/day
4. $\text{Volume/vehicle/year} = \text{Vehicle Capacity} \times \text{No. Refills/day} \times \text{No. days used}$
5. Total the water use for each vehicle per year

2. Discharge Procedure

When water is applied directly from a pipe, as in a sprinkler system or line flushing, use the discharge procedure. This method might be used to estimate sewer or construction flushing.

- Multiply the rate of water discharged (gpm) by the total time water flows (# minutes). This yields the volume of water delivered from the distribution system.

Caution - The discharge rate may vary and the application period may vary in length and frequency. Careful record keeping of each instance is necessary to obtain accurate estimates.

Examples:

Main Flushing

Water lost from the distribution system due to contaminant and debris cleaning, chlorine residual maintenance, storm drain flushing etc.

- To estimate the volume used for each location flushed, multiply the flow rate by the discharge duration.

In preparation for future audits, all personnel in charge of main flushing should be equipped with water use recording forms.

Irrigation

- Use of the Discharge Method
 $\text{Discharge rate to each irrigated area} \times \text{Total time water applied to area}$
 Ex: $20,000 \text{ gpd} \times 100 \text{ days/yr} = 2.0 \text{ mgy}$

3. Comparison Procedure

If metered similar facilities such as schools, construction sites, golf courses, parks, pools etc. exist, then estimates can be made for unmetered similar sites. Of course, the sites must be alike in size, number of students, irrigated acreage, irrigation methodologies and most other details. Any differences must be accounted for.

Examples:

Irrigation

- Use of the Comparison Method

Site A is a 20 acre sports complex irrigating 15 acres of turf and 5 acres of landscape.

Site B is a city park irrigating 5 acres of turfgrass. Site A is metered and using 18 mgy.

By comparison, site B should use about 1/4 the amount as site A or an estimated 4.5 mgy.

Construction Sites

Water delivered, primarily through hydrants, to trucks for controlling road dust, site

preparation, landscaping, temporary domestic use, and materials processing.

- Use the *comparison* procedure. Estimate use by taking data from similar metered construction sites.

It is recommended that all contractors be required to use a portable meter in the future.

3L *Sums up the miscellaneous uses.*

This is the sum of all the miscellaneous uses.

TASK 4: Summary of Water Use

Task 4 summarizes the utilities water use and losses associated with both the treatment and distribution systems.

4A *Total Water From Distribution System*

This is a summary of all water uses within the distribution system.

4B *Total Finished Water Pumped into the Distribution System*

Water pumped into the distribution system as recorded by the plant master meter.

4C *Finished Water Purchased after water treatment plant master meter*

This is the total volume of purchased treated water that enters your distribution system **after** the plant master meter. This volume may be obtained from metered interconnections with other utilities or suppliers and is not previously accounted for in Tasks 1, 2, and 3.

4D *Sum of Finished Water going into the Distribution System.*

This is the sum of all water placed into the distribution system from the water treatment plant.

4E *Total Unaccounted for Water loss from Distribution System*

This represents the amount of water that is not accounted for in distribution.

4F *Total Unaccounted for Water From Treatment and Distribution Systems*

Represents the total difference between what was pumped and what was distributed to customers.

4G *Percentage Total Unaccounted for Water From Treatment and Distribution Systems*

Shows line 4F as percentage of the total water produced and purchased.

TASK 5: Meter Survey

A correction to account for meter error is required if the initial unaccounted for water result (in line 4F) is greater than 10% (see attached water audit form). The applicant must perform a meter survey and use the information to correct the amounts listed in Task 2. The purpose of this survey is to determine a potential correction factor for metered water use by testing a representative sampling of meters of various ages. The survey also helps to determine the appropriateness for a meter change-out program. The permit applicant is required to randomly test 5% or 100 meters, whichever is less. The sampling must be a selection of meters representing an even distribution of type and age or cumulative lifetime flow. This requirement may be replaced by a documented meter change-out program that can provide an estimate of the overall meter accuracy. This survey will likely be less productive if greater than 80% of the small/medium meters are less than 5 years in age.

TASK 6: Leak Detection Evaluation

If the total unaccounted for loss of the system from line 4F is 10% or greater, the applicant is required to evaluate the feasibility of completing the leak detection survey found on the water audit form. The applicant has the option to perform the leak detection immediately or to propose a one year program to improve water use accountability to below 10% and then to repeat the audit. If the second audit shows unaccounted-for water loss above 10% , the permittee must implement the leak detection program where feasible.

For the purpose of the leak detection evaluation, it is assumed that 50% of the unaccounted-for water may be recovered. The cost of the leak detection survey can be estimated from past surveys or calculated from estimates. It is suggested the smaller systems check with the Florida Rural Water Association for guidance on cost estimates.

6A *Potential Water System Leakage*

This is the potential system leakage shown as the total unaccounted for water as calculated in Task 4 (4F).

6B *Annual Potential System Leakage*

This is the potential system leakage shown as the total unaccounted for water as calculated in Task 4 (4F) modified to reflect an annual basis.

6C *Recoverable Leakage*

Assumes 50% of the amount shown in 6C is recoverable.

6D *Production Cost per Million Gallons*

Your cost to produce water per million gallons.

6E *Recoverable Savings*

The costs that can be achieved if the lost water is recovered.

6F *Estimated Cost of Leak Detection Survey*

Cost to perform a leak detection survey.

6G *Estimated Recovery Period*

How many years it would take to recover the cost of performing a leak detection survey based on the amount of water cost recovered.

WATER AUDIT FORM

Utility Name: _____

Audit Study Period (Beginning and ending day/month): _____

Consumptive Use Permit Application No. _____

The water audit is designed to provide assurances of water accountability within the treatment and water distribution systems. The information provided below must reflect volumes covering a period of at least 12 consecutive months within the three year period preceding the application submittal.

TASK 1: Treatment System

- 1A Raw water produced _____ Mgals
- 1B Raw water purchased _____ Mgals
- 1C Finished water purchased _____ Mgals
- 1D Total Water Produced and Purchased _____ Mgals
(Sum of lines 1A - 1C)
- 1E Metered uses in treatment _____ Mgals
- 1F Unmetered but known uses in treatment _____ Mgals
- 1G Total water used in treatment _____ Mgals
(line 1E plus line 1F)
- 1H Total water produced and purchased for _____ Mgals
distribution (line 1D minus line 1G)
- 1I Metered Finished Water entering _____ Mgals
distribution system
(from plant master meter)
- 1J Change in reservoir and tank storage _____ Mgals
*(If increase: subtract)
*(If decrease: add)
- 1K **Total water unaccounted for in the treatment** _____ Mgals
process (line 1H minus line 1I, plus/minus line 1J:
Can be either + or -)

TASK 2: Distribution System - Metered Uses*

2A Small and Medium Meter Use _____ Mgals

2B Large Meter Use _____ Mgals

2C Adjustments due to meter lag time _____ Mgals

2D Sum of lines 2A - 2C _____ Mgals

*The applicant must perform a meter survey (see instructions and the attached survey form) if the initial unaccounted for water loss is 6% or greater (as listed in line 4F). When a meter survey is performed, the information submitted in Task 2 must be corrected pursuant to the meter survey.

TASK 3: Distribution System - Metered uses not covered in TASK 2 and unmetered uses

(Please check)

***Documented *Negligible/
Undocumented**

3A	Irrigation	_____	Mgals	?	?
3B	Swimming Pools	_____	Mgals	?	?
3C	Sewer Cleaning	_____	Mgals	?	?
3D	Water Quality Flushing	_____	Mgals	?	?
3E	Fire Fighting	_____	Mgals	?	?
3F	Construction flushing	_____	Mgals	?	?
3G	Main Breaks	_____	Mgals	?	?
3H	Schools	_____	Mgals	?	?
3I	Decorative Fountains	_____	Mgals	?	?
3J	Allowable Line Loss	_____	Mgals	?	?
3K	Other Uses (Attach list):	_____		?	?
3L	Total:	_____	Mgals		
	(sum of lines 3A - 3K)				

* Negligible/Undocumented - Check if you feel the amount represents a very small part of the overall total water use or if the amount is not documented.

* Documented - Check if the water use estimate is documented. Only documented use estimates will be accepted for items 3A-3K. Documentation must take the form of metered reports, journal entries or other records.

TASK 4: Summary of Water Use

- 4A Total water from distribution system _____ Mgals
(line 2D plus line 3L)
- 4B Total finished water pumped into distribution system _____ Mgals
(line 1I)
- 4C Finished water purchased after WTP Master Meter _____ Mgals
(i.e. not previously accounted for in TASK 1)
- 4D Sum of finished water going into the distribution System _____ Mgals
(sum of 4B and 4C)
- 4E Total unaccounted for water loss from distribution _____ Mgals
(line 4D minus line 4A)
- 4F Total unaccounted for water from treatment and distribution systems** (sum of lines 1K plus line 4E) _____ **Mgals**
- 4G Percentage total unaccounted for loss from treatment and distribution systems** (divided line 4F by the sum of lines 4C plus 1H, then multiply by 100) _____ %

TASK 5: Meter Survey

A correction to account for meter error is required if the initial unaccounted for water result (in line 4F) is greater than 10% (see attached water audit form). The applicant must perform a meter survey and use the information to correct the amounts listed in Task 2. The purpose of this survey is to determine a potential correction factor for metered water use by testing a representative sampling of meters of various ages. The survey also helps to determine the appropriateness for a meter change-out program. The permit applicant is required to randomly test 5% or 100 meters, whichever is less. The sampling must be a selection of meters representing an even distribution of type and age or cumulative lifetime flow. This requirement may be replaced by a documented meter change-out program that can provide an estimate of the overall meter accuracy. This survey will likely be less productive if greater than 80% of the small/medium meters are less than 5 years in age.

Provide the following supplemental information:

Small and Medium Meter Survey (Choose Method 1 or Method 2)

Small - 1 inch or less Medium - 1 to 3 inches

Method 1 - Meter Age

The purpose of this survey is to determine a potential correction factor for small and medium meter water use found on line 2A of the audit form by testing a representative sampling of meters of various ages. The survey also helps to determine the appropriateness for a meter change-out program. The permit applicant is required to randomly test 5% or 100 meters, whichever is less. The sampling must be a selection of meters representing an even distribution of type and age or cumulative lifetime flow. This requirement may be replaced by a documented meter change-out program that can provide an estimate of the overall meter accuracy. This survey will likely be less productive if greater than 80% of the small/medium meters are less than 5 years in age.

List age and type of small/medium sized meters in system.

< 5 years	_____ (#)	_____ % of system
between 5 and 10 years	_____	_____ % of system
between 10 and 15 years	_____	_____ % of system
> 15 years	_____	_____ % of system
total # of meters	_____	_____ % of system

Estimated error of meters (average)

< 5 years _____ (%)

between 5 and 10 years _____

between 10 and 15 years _____

> 15 years _____

Total adjustment for meter survey _____ Mgals or _____ %

Method 2 - Cumulative Lifetime Flow

Small Meters

No. of meters whose cumulative lifetime flow exceeds .75 mgals _____

Percent of all small meters _____ %

Estimated error from testing sample (average or mean) _____ %

Total small meter adjustment for lifetime flow survey _____ mgals or _____ %

Medium Meters

No. of meters whose cumulative lifetime flow exceeds 44.8 mgals _____

Percent of all small meters in system _____ %

Estimated error from testing sample (average or mean) _____ %

Total small meter adjustment for lifetime flow survey _____ mgals or _____ %

Large Meter Adjustments

A survey of all large meter (larger than 3-inches in size) must be completed. An average of the meter error or a cumulative gallon change is utilized to make this adjustment. Summarize the following:

of meters surveyed _____

Average determined error _____ %

Cumulative gallon correction _____mgals.

Total Meter Adjustments

Small and Medium _____ mgals (line 2A)

Large _____ mgals (line 2B)

Total (small, medium + large) _____ mgals

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TASK 6: Leak detection Evaluation (determination required if final unaccounted for water is >10% as listed in line 4F)

- 6A Potential water system leakage _____ Mgals
(total from line 4F)
- 6B Annual potential water system leakage _____ Mgals
(divide line 6A by the number of years of record
used in the audit, i.e. 6A divided by 1.5 if
18 months of record in audit)
- 6C Recoverable leakage (multiply line 6B by 0. 5) _____ Mgals
- 6D Annual production cost per million gallons \$ _____
(includes O&M and production costs)
- 6E Annual recoverable savings \$ _____
(multiply line 6C and 6D)
- 6F Estimated cost of leak detection survey* \$ _____
- 6G Estimated recovery period _____ yrs
(line 6E divided by line 6F)

*Submit documentation describing how this cost was estimated.

Prepared by:

Name: _____

Title: _____

Date: _____

APPENDIX C

ACCOUNT LEVEL DATA ANALYSIS

The steps below summarize the SJRWMD methodology for analysis of water conservation potential. Additional details about this process can be found in *Water Conservation Potential for the District Water Supply Plan 2010*, SJRWMD Special Publication SJ2011-SP2. Assistance in processing data to perform this analysis is available from SJRWMD staff.

Step 1. Join account level billing data with parcel attribute data

The first step in the analysis is to match account level billing data with information about the land parcels where the water is used, taken from the county property appraisal database. This can be done in a number of ways depending on the output from the utility's billing system but all require expertise in dealing with digital databases or geographic information systems:

- Join database attributes using the parcel or other identification number.
- Use the geocoding function of a geographic information system to locate account addresses.
- Join data spatially with a geographic information system using meter locations.

The above listed processes each require skills in computer database manipulation or geographic information systems (GIS).

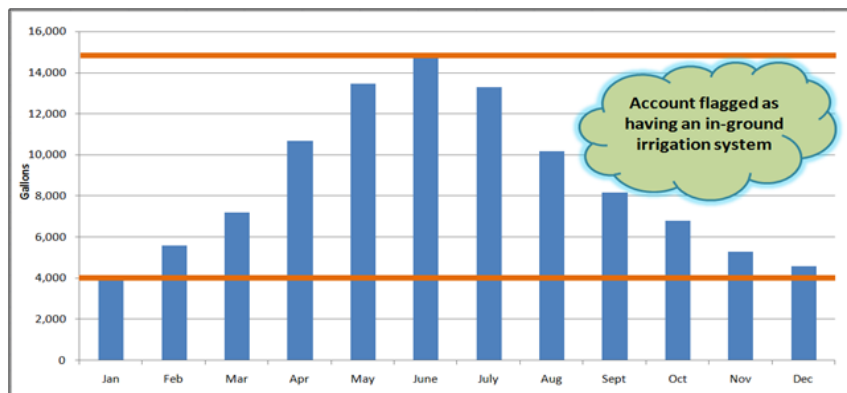
After the account data and parcels are joined, the data should be screened and flagged for missing and extremely high or low values values that should be filled in or corrected where reasonably possible. Accounts for which correct values cannot be assured should be deleted from the analysis.

The database must be set up to be sortable by at least the following features:

- Florida Department of Revenue (DOR) Land Use Code
- Year built
- Single-family residential parcel valuations

Where possible, the following types of accounts also should be flagged for special analyses:

- Accounts within reclaimed water service areas
- Accounts likely using automatic irrigation systems (maximum month minus minimum month > 10,000 gallons)
- Accounts known to have private irrigation wells



Max Month – Min
Month > 10KGal

Step 2. Group Accounts by User Characteristics

Account level water use data needs to be broken down into several subsets of single-family residences by value, age, lot size, irrigation water source; multi-family residences by age and meter configuration; and major groups of commercial/industrial/institutional (C/I/I) uses by use type and age. This will allow analysis of water use efficiency by account and subsequent targeting of specific sites for specific BMPs.

Age of Structures. Dividing served parcels into three groups according the construction date of the primary structure on the parcel provides the opportunity to account for plumbing codes and typical flow rates for fixtures and appliances installed during each period. This information is used to identify cost-effective opportunities for indoor retrofit programs. The recommended date ranges correspond to changes of flow rates allowed in plumbing code:

- 1983 and older
- 1984 – 1993
- 1994 and later

Single-family Residences with Automatic Irrigation Systems Served by Public Supply.

Property appraisal data should be used to identify which single-family residences have automatic irrigation systems, if that information is included in the property appraisal information. If property appraisal data does not indicate which single-family residences have automatic irrigation systems, total monthly water use for an account may be used to identify which parcels are most likely to have such systems. The utility may use statistical analysis to identify a breaking point between clusters of water use data or may use a default value of 9,500 gallons per connection per month, with the assumption that any account with monthly water use greater than 9,500 gallons has an automatic irrigation system. This information is used to identify opportunities for improvements to landscape irrigation efficiency.

Commercial/industrial/institutional Water Users. C/I/I land uses can be identified by Florida Department of Revenue (DOR) codes that appear in county property appraiser databases. The C/I/I uses that account for the most public supply water use in northeast Florida generally are for office buildings, retail, hotels, restaurants, manufacturing, automobile dealers and repairs, live-in care, warehouse and storage, indoor recreation, hospitals, schools, and grocery stores. The utility may use these or other groups of DOR codes, as indicated appropriate by the establishments served by that utility.

Step 3. Calculating Water Use

Historical water use should be calculated for each water use type and subset of single-family residences. These values serve as the baseline from which potential reductions are calculated. The following water use metrics are usually useful:

- Gallons of water use per account per day
- Gallons of indoor water use per capita per day (residential only)
- Gallons of outdoor water use per irrigable area (single-family residential only)

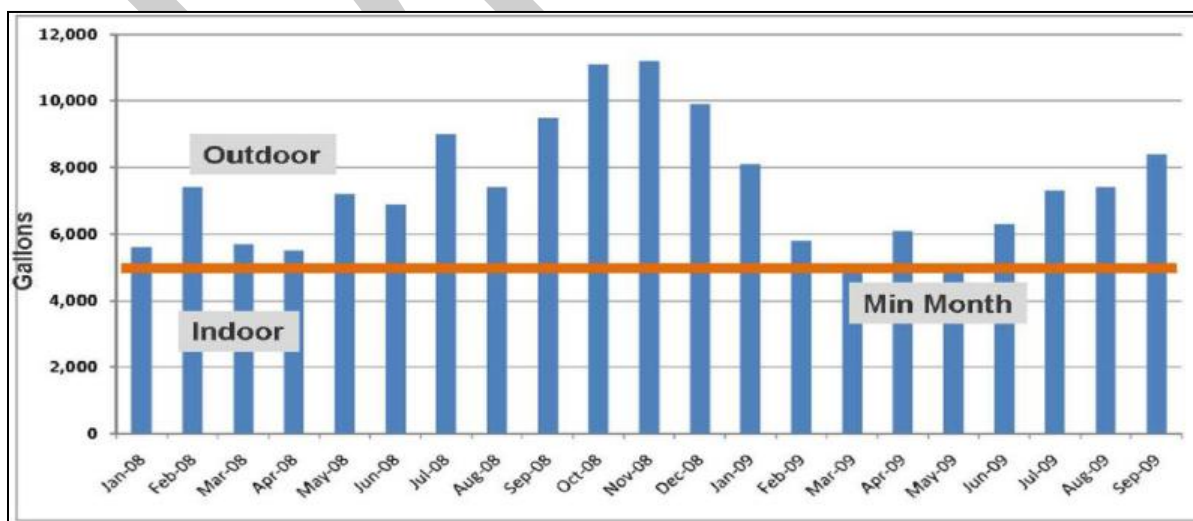
Per capita calculations should be based on the average number of persons per household for the service area, according to the United States Census or a local survey based on representative sample.

Utility specific water use should be calculated for each user group listed below for existing development and for projected new development. If the plan is being developed to support a CUP application, projected water use for the duration of the permit will be needed.

- Single-family residences, grouped by value, age, lot size, and irrigation source
- Multifamily residences, grouped by age
- Commercial/Industrial/Institutional accounts, grouped according to DOR code.

Outdoor Water Use for Single-family Residences. Outdoor water use for single-family residences may be estimated by one of the methods listed below or by other methods. If different methods yield markedly different results, the method producing the higher or highest values for outdoor water use generally is recommended. This information is used to identify opportunities for improvements to landscape irrigation efficiency. Not all outdoor residential water use is for irrigation but relatively little is used for other purposes.

- Subtracting the minimum month volume from the maximum month value
- Subtracting 69 gallons from the total gallons per capita per day
- Using the standard deviation of the account water use data



Step 4. Calculating Benefits and Costs

Details concerning water savings achieved in relation to financial investment in BMPs is available for the Conserve Florida Guide, the Alliance for Water Efficiency, or SJ2011-SP2. The terms “BMP” and “water conservation measure” as used in these instructions are consistent with their use by the Conserve Florida Guide. BMPs are actions for which the amount of water use reduction achieved can be measured, such as plumbing fixture retrofits. Conservation measures are actions for which the amount of water use reduction achieved cannot be directly measured, such as education and program administration. Goal-based water conservation plans focus primarily on the implementation of BMPs. Reliance on BMPs allows the comparison of costs to benefits, which can be used to identify which conservation practices are the most cost-effective. However, water conservation measures, such as program administration and educational efforts to gain public acceptance, also must be added to the cost of implementing a water conservation program.

Examples of water conservation BMPs that are likely to be cost effective include:

System-wide

- Conservation Coordinator and Customer Education
- Aggressive Meter Monitoring Program

Indoor

- Low-Flow Showerhead Installation
- High-Efficiency Showerhead Replacement
- Low-Flow Faucet Aerator Replacement
- High-Efficiency Toilet Replacement Program
- High-Efficiency Clothes Washer Replacement
- High-Efficiency Dishwashers
- Urinal Replacement Program
- Waterless Urinal Replacement Program
- Commercial Kitchen Pre-Rinse Spray Valve Replacement
- Water Reuse/Recycling Laundry Machines
- Ordinances Adopting Higher Indoor Efficiency Standards
- Submetering-Billing of Apartment Units – Indoor

Outdoor

- Increased Irrigation Systems Efficiency
- Rain sensor shut-off devices
- Soil Moisture Sensor Shut-Off Devices
- Evapotranspiration Irrigation Controllers
- Landscape Replacement
- Modifications to Land Development Regulations

In this analysis, land parcel attributes are joined with a standardized measure of water use, such as gallons per day or gallons per square foot (C/I/I), to estimate conservation potential for various conservation practices applicable to the type of use and age of structure. The following equation is an example of how this calculation may be performed.

$$[CP = U * WU * BMP_i]_C$$

CP = Conservation Potential (typically gallons per day)
U = Spatial Attribute (typically in units of area)
WU = Water Use Benchmark (typically gallons per day)
BMP = Percent of Water Use Reduction from each Best Management Practice
C = Water Use Category Subset (as parsed above)

The cost of implementing each water conservation practice must be expressed in annualized present value for direct initial capital investment, program overhead, and ongoing operation and maintenance costs per 1000 gallons per day of water use reduction for each year covered by the plan. This allows the utility to compare the cost of water conservation with the current cost of water production and the cost of potential additional increments of water production.

The opportunity to implement a BMP is limited in part by previous implementations. If records of previous replacement programs are available, the numbers of implementations associated with those programs must be deleted from total available for new implementations.

Passive Replacement. Not all BMP implementations are the result of utility or government initiatives. Many appliances and fixtures are replaced at times of remodeling or when an appliance wears out, without mandate or incentive from a utility or governmental entity. This process is called *passive replacement*. Passive replacement both limits the opportunity for programmatic implementation of retrofits and provides future implementations at no cost to the utility of local government. The method for calculating passive replacement assumes that there is a time period (half the device life) when device failure and remodeling change-out is very low. After this initial period, devices are replaced at an annual rate according to available saturation and replacement studies until passive replacement reaches 100 percent. Once a device reaches 100 percent replacement, it no longer has conservation potential until a newer, more efficient standard is available. If there is a more efficient device, the passive replacement calculation estimates the number of replacements to the newer model.

APPENDIX C

- **SJRWMD LPT Water Conservation Planning Template**

(Insert utility name.) Water Conservation Plan

DRAFT

(Insert date.)

(Insert utility name.)

Water Conservation Plan

Introduction

This water conservation plan is developed in accordance with the St. Johns River Water Management District (SJRWMD) guidelines for preparation of goal-based water conservation plans for public supply utilities, utilizing the SJRWMD Linear Programming Tool for analyzing water conservation potential and costs. It includes summaries of a system audit; a leak detection and repair program, a rate analysis, an analysis of existing water use; water use reduction goals; selected of water conservation best management practices (BMPs) and measures to be implemented; and timelines and budgets for the implementation. The water use efficiency goals set in this plan are based on current water use patterns and projected future supply needs. Actions to improve system efficiency and end user water use efficiency, and a rate structure evaluation are addressed.

An in-depth analysis of the utility's water use has been performed using account-level billing data, matched with user attributes to identify end user water use patterns and compare them with efficient water use for each specific site. This analysis used county property appraiser data to determine use-type information (residential, commercial, etc.), parcel size, building size, number and type of plumbing fixtures, and year of construction, to identify quantities and locations of water consumption for specific uses. Potential savings are identified where actual water use is greater than efficient use. Cost-benefit analysis is then used to determine the most economically feasible conservation BMPs to implement in that utility service area.

I. Utility System Audit Summary

An audit of the (insert name of utility) treatment and distribution system, using the St. Johns River Water Management District Water Audit Form, yielded the following results: (Task 4 from SJRWMD public supply system Water Audit Form, No. 40C-22-0590-3)

Million Gallons per Day*
(Insert quantities.)

1. Total water from treatment system
2. Total finished water pumped into distribution system
3. Finished water purchased after WTP Master Meter
4. Sum of finished water going into the distribution System
5. Total unaccounted for water loss from distribution
6. Total unaccounted for water from treatment and distribution systems
7. Percentage total unaccounted for loss from treatment and distribution systems

*millions of gallons per day

II. Leak Detection Program (If the system audit indicates 10 percent or more unaccounted water or if the utility determines that its is cost effective to implement a leak detection program even if unaccounted water is less than 10 percent)

The percentage of unaccounted for water (Or: An analysis of economic level of leakage...) indicates the need for a leak detection program. The schedule and budget planned for system leak detection and repair are shown in Table 1.

Table 1. Leak Detection and Repair Implementation.

Plan Year	(Base Year, Insert year) Unaccounted Water (mgd)	(Base Year, Insert year) Unaccounted Water Percentage	Projected Daily Leak Reduction (mgd)	Projected Unaccounted Water Percentage	Annual Total Cost of Leak Reduction (dollars)	Annualized Cost Per 1000 Gallons of Reduced Water Loss (dollars)
Total						

III – Utility Residential Water Use Profile

An analysis of account-level billing data matched with user-type attributes was performed to identify water use patterns to compare with efficient water use for each use site. This analysis utilized county property appraiser data for use-type information (residential, commercial, etc.), parcel size, building size, number and type of plumbing fixtures, and year of construction, to identify quantities and locations of water consumption for specific uses. Tables 2 through 5 summarize the data that were used in the analysis.

Table 2. Number of residential units by construction date and bathrooms

Residential Category	1983 and older		1984 - 1993		1994 - present	
	1 bath room	2 or more baths	1 bath room	2 or more baths	1 bath room	2 or more baths
Single-family with 1 meter						
Single-family with extra potable irrigation meter						
Single-family with separate meters for potable use and reuse						
Multifamily						

Table 3. System-wide total potable water use

Water Use Category	Water Use (mgd)
Single-family residential	
Multifamily residential	
Commercial/Industrial/ Institutional	
Utility and public use	
Other (If needed)	
Total	

Table 4. Percentage of meters registering water use

Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec

Table 5. Average water use per month for singly family residential connections, by year.

Water Use in Gallons per Month	Number of Connections		
	Year ____	Year ____	Year ____
0 - 2000			
2001 - 4000			
4001 - 6000			
6001 - 8000			
8001 - 10000			
10001 - 12000			
12001 - 14000			
14001 - 16000			
16001 - 18000			
18001 - 20000			
20001 - 22000			
22001 - 24000			
24001 - 26000			
26001 - 28000			
28001 - 30000			
30001 - 32000			
32001 - 34000			
34001 - 36000			
36001 - 38000			
38001 - 40000			
40001 - 42000			
42001 - 44000			
44001 - 46000			
46001 - 48000			
48001 - 50000			
50001 - 60000			
60001 - 70000			
70001 - 80000			
80001 - 90000			
90001 - 100000			
100001 and over			

*Include separate tables for potable general use water, potable irrigation meters, and non-potable sources.

VI – Water Conservation Rate Analysis –

Several rate scenarios were calculated to determine if further investigation of modifying the current rate structure to achieve water use reduction is merited. Selected scenarios are shown in Tables 6 and 7. These scenarios indicate that... (Insert description of the tested rate scenarios and a discussion of any decision based on the model output.)

Table 6. Alternative Rate Scenarios¹

Scenario Number	Estimated Daily Demand Under New Rate Structure (mgd)	Estimated Daily Demand Reduction from New Rate Structure (mgd)	Estimated Revenue Under New Rate Structure dollars	Estimated Difference in Revenue Under New Rate Structure dollars	Cost of Implementing New Rate Structure (dollars)	Cost Per 1000 gallons of Demand Reduction (dollars)
Total						

¹Based on projected water demand of _____ and revenue of _____ under current rate structure for base year _____. (Utility fill in blanks)

Table 7 Rate Scenarios

Scenario Number	Base Charge	Tier One Rate ¹ (Insert range of gallons at this price.)	Tier Two Rate ¹ (Insert range of gallons at this price.)	Tier Three Rate ¹ (Insert range of gallons at this price.)	Tier Four Rate ¹ (Insert range of gallons at this price.)
Total					

V. Identifying Cost-Effective End User Water Conservation Best Management Practices (BMPs) and Measures

The SJRWMD process for analyzing account level utility billing data and county property appraisal data was used to identify end user water conservation opportunities and evaluate the cost effectiveness of alternative BMPs. (If a different analytical tool was used it should be named and described here.)

The estimated benefits, in improved water use efficiency, and the cost of implementation for available BMPs and water conservation measures are shown in Table 8 for residential water use and in Table 9 for commercial/industrial/institutional water uses.

The terms “BMP” and “water conservation measure” as used in this plan are consistent with their use by the Conserve Florida Guide. BMPs are actions for which the amount of water use reduction achieved can be measured, such as plumbing fixture retrofits. Conservation measures are actions for which the amount of water use reduction achieved cannot be directly measured, such as education and program administration. Goal-based water conservation plans focus primarily on the implementation of BMPs. Reliance on BMPs allows the comparison of costs to benefits, which can be used to identify which conservation practices are the most cost-effective. However, water conservation measures, such as program administration and educational efforts to gain public acceptance, also must be added to the cost of implementing a water conservation program.

Table 9. Planning period summary of costs and water savings.

Utility Summary								
Conservation Program Variables								
Discount Rate		5%						
Program Implementation Period		20	Years					
Capital Cost Threshold		\$45,000,000						
Projected Baseline Water Use Conditions (2030)			Water Use (gpd)					
2008 WSA Projection								
Parcel Growth Based Projection*								
Residential Conservation Practice	Passive Replacement Fixtures	Passive Savings (gpd)	Number of Program Implementations	Cost per Program Implementation	Program Savings (gpd)	Total Savings (gpd)	Capital (PV)	Unit Cost (\$/Kgal)
LF Showerhead								
HE Showerhead								
Low Flow Bathroom Faucet Aerators								
Low Flow Kitchen Faucet Aerators								
Ultra Low Flow Toilets								
High Efficiency Toilets								
High Efficiency Clothes Washers								
High Efficiency Dishwashers								
Operation Based Residential Irrigation Audit								
Repair Based Residential Irrigation Audit								
Design Based Residential Irrigation Audit								
Soil Moisture Sensors								
Advanced ET Irrigation Controllers								
Water-wise Florida Landscape- Inground								
Ordinances Adopting Higher Indoor Efficiency Standards								
Modifications to Land Development Regulations								
Subtotals								

Commercial Conservation Practice	Passive Replacement Fixtures	Passive Savings (gpd)	Number of Program Implementations	Cost per Program Implementation	Program Savings (gpd)	Total Savings (gpd)	Capital (PV)	Unit Cost (\$/Kgal)
LF Shower heads								
HE Shower heads								
Low Flow Bathroom Faucet Aerators								
Ultra Low Flow Toilets								
High Efficiency Toilets								
Low Flow Urinals								
Waterless Urinals								
Low Flow Kitchen Faucet Aerators								
Ordinances Adopting Higher Indoor Efficiency Standards								
Subtotals								

Summary	Passive Replacement Fixtures	Passive Savings (gpd)	Number of Program Implementations		Program Savings (gpd)	Total Savings (gpd)	Capital (PV)	Unit Cost (\$/Kgal)
Total Savings and Program Cost *								
Total Savings and Program Cost with 20% contingency								

*Parcel growth based projection is the estimated water use on the customer side of the meter only for the top water using residential and commercial Department of revenue land use categories and does not include plant or delivery system loss.

**Energy savings calculated as avoided utility water treatment and pumping costs due to conservation over the implementation period from Watergy: A Water and Energy Conservation Model for Federal Facilities, 1996. Updated avg electricity cost of \$.08/kWh from SJ2008-SP10.

DRAFT

APPENDIX D

- **SJRWMD Non-LPT Water Conservation Planning Template**

(Insert utility name.) Water Conservation Plan

DRAFT

(Insert date.)

(Insert utility name.) Water Conservation Plan

Introduction

This water conservation plan is developed in accordance with the St. Johns River Water Management District guidelines for preparation of goal-based water conservation plans for public supply utilities. It includes summaries of a system audit; a leak detection and repair program, a rate analysis, an analysis of existing water use; water use reduction goals; selected water conservation best management practices (BMPs) and measures to be implemented; and timelines and budgets for the implementation. The water use efficiency goals set in this plan are based on current water use patterns and projected future supply needs. Actions to improve system efficiency and end user water use efficiency, and a rate structure evaluation are addressed.

An in-depth analysis of the utility's water use has been performed using account-level billing data, matched with user attributes to identify end user water use patterns and compare them with efficient water use for each specific site. This analysis used county property appraiser data to determine use-type information (residential, commercial, etc.), parcel size, building size, number and type of plumbing fixtures, and year of construction, to identify quantities and locations of water consumption for specific uses. Potential savings are identified where actual water use is greater than efficient use. Cost-benefit analysis is then used to determine the most economically feasible conservation BMPs to implement in that utility service area.

I. Utility System Audit Summary

An audit of the (insert name of utility) treatment and distribution system, using the St. Johns River Water Management District Water Audit Form, yielded the following results: (Task 4 from SJRWMD public supply system Water Audit Form, No. 40C-22-0590-3)

Million Gallons per Day*
(Insert quantities.)

1. Total water from treatment system
2. Total finished water pumped into distribution system
3. Finished water purchased after WTP Master Meter
4. Sum of finished water going into the distribution System
5. Total unaccounted for water loss from distribution
6. Total unaccounted for water from treatment and distribution systems
7. Percentage total unaccounted for loss from treatment and distribution systems

*millions of gallons per day

II. Leak Detection Program (If the system audit indicates 10 percent or more unaccounted water or if the utility determines that its is cost effective to implement a leak detection program even if unaccounted water is less than 10 percent)

The percentage of unaccounted for water (Or: An analysis of economic level of leakage...) indicates the need for a leak detection program. The schedule and budget planned for system leak detection and repair are shown in Table 1.

Table 1. Leak Detection and Repair Implementation.

Plan Year	(Base Year, Insert year) Unaccounted Water (mgd)	(Base Year, Insert year) Unaccounted Water Percentage	Projected Daily Leak Reduction (mgd)	Projected Unaccounted Water Percentage	Annual Total Cost of Leak Reduction (dollars)	Annualized Cost Per 1000 Gallons of Reduced Water Loss (dollars)
Total						

III – Utility Residential Water Use Profile

An analysis of account-level billing data matched with user-type attributes was performed to identify water use patterns to compare with efficient water use for each use site. This analysis utilized county property appraiser data for use-type information (residential, commercial, etc.), parcel size, building size, number and type of plumbing fixtures, and year of construction, to identify quantities and locations of water consumption for specific uses. Tables 2 through 5 summarize the data that were used in the analysis.

Table 2. Number of residential units by construction date and bathrooms

Residential Category	1983 and older		1984 - 1993		1994 - present	
	1 bath room	2 or more baths	1 bath room	2 or more baths	1 bath room	2 or more baths
Single-family with 1 meter						
Single-family with extra potable irrigation meter						
Single-family with separate meters for potable use and reuse						
Multifamily						

Table 3. System-wide total potable water use

Water Use Category	Water Use (mgd)
Single-family residential	
Multifamily residential	
Commercial/Industrial/ Institutional	
Utility and public use	
Other (If needed)	
Total	

Table 4. Percentage of meters registering water use

Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec

Table 5. Average water use per month for singly family residential connections, by year.

Water Use in Gallons per Month	Number of Connections		
	Year ____	Year ____	Year ____
0 - 2000			
2001 - 4000			
4001 - 6000			
6001 - 8000			
8001 - 10000			
10001 - 12000			
12001 - 14000			
14001 - 16000			
16001 - 18000			
18001 - 20000			
20001 - 22000			
22001 - 24000			
24001 - 26000			
26001 - 28000			
28001 - 30000			
30001 - 32000			
32001 - 34000			
34001 - 36000			
36001 - 38000			
38001 - 40000			
40001 - 42000			
42001 - 44000			
44001 - 46000			
46001 - 48000			
48001 - 50000			
50001 - 60000			
60001 - 70000			
70001 - 80000			
80001 - 90000			
90001 - 100000			
100001 and over			

*Include separate tables for potable general use water, potable irrigation meters, and non-potable sources.

VI – Water Conservation Rate Analysis –

Several rate scenarios were calculated to determine if further investigation of modifying the current rate structure to achieve water use reduction is merited. Selected scenarios are shown in Tables 6 and 7. These scenarios indicate that... (Insert description of the tested rate scenarios and a discussion of any decision based on the model output.)

Table 6. Alternative Rate Scenarios¹

Scenario Number	Estimated Daily Demand Under New Rate Structure (mgd)	Estimated Daily Demand Reduction from New Rate Structure (mgd)	Estimated Revenue Under New Rate Structure (dollars)	Estimated Difference in Revenue Under New Rate Structure (dollars)	Cost of Implementing New Rate Structure (dollars)	Cost Per 1000 gallons of Demand Reduction (dollars)
Total						

¹Based on projected water demand of _____ and revenue of _____ under current rate structure for base year _____.

Table 7 Rate Scenarios

Scenario Number	Base Charge	Tier One Rate ¹ (Insert range of gallons at this price.)	Tier Two Rate ¹ (Insert range of gallons at this price.)	Tier Three Rate ¹ (Insert range of gallons at this price.)	Tier Four Rate ¹ (Insert range of gallons at this price.)
Total					

V. Identifying Cost-Effective End User Water Conservation Best Management Practices (BMPs) and Measures

The (select one: Conserve Florida Guide or Alliance for Water Efficiency tool) was used to identify end user water conservation opportunities and evaluate the cost effectiveness of alternative BMPs. (If a different analytical tool was used it should be named and described here.) The estimated benefits, in improved water use efficiency, and the cost of implementation for available BMPs and water conservation measures are shown in Table 8 for residential water use and in Table 9 for commercial/industrial/institutional water uses.

The terms “BMP” and “water conservation measure” as used in this plan are consistent with their use by the Conserve Florida Guide. BMPs are actions for which the amount of water use reduction achieved can be measured, such as plumbing fixture retrofits. Conservation measures are actions for which the amount of water use reduction achieved cannot be directly measured, such as education and program administration. Goal-based water conservation plans focus primarily on the implementation of BMPs. Reliance on BMPs allows the comparison of costs to benefits, which can be used to identify which conservation practices are the most cost-effective. However, water conservation measures, such as program administration and educational efforts to gain public acceptance, also must be added to the cost of implementing a water conservation program.

[illegible]

[illegible]

VI – Selected End User Best Management Practices (BMPs) and Measures

The following BMPs and water conservation measures have been selected for implementation based on the estimated benefits and costs shown in Tables 6 and 7.

(Insert descriptions of BMPs and water conservation measures from SJ2011-SP2)

VIII. Implementation Schedule and Budget

The schedule and budget for implementation of each water conservation program element is presented in Table 10. This section tells when rate adjustments, leak detection and repair, and each selected BMP and supporting measure will be implemented, how much money is planned to be spent on each, and how much demand reduction it should produce. Schedule, budget, and water use reduction are shown together to draw the connection between financial expenditures and anticipated results. This information can be shown concisely in tabular format, as illustrated in Table 10.

IX. Projected Overall Water Use and Savings Summary

The projected overall annual impact of the entire conservation program for the duration of the plan is shown in Table 11. This table shows the anticipated results of rate adjustments, leak detection and repair, BMP implementation, and passive savings for a water conservation program savings total and how much remaining demand must be met after the effects of conservation are subtracted from projected demand.

Table 10. Annual Implementation Schedule and Budget
Plan Year 1

Best Management Practice	Planned Budget			Water use			Cost per 1000 Gallons	
	Direct Cost ¹	Overhead Cost ²	Operation and Maintenance Cost ³	Existing Water Use (mgd) ⁴	Planned Water Use Reduction (mgd) ⁴	Percent Change ⁴	Initial Cost per 1000 Gallons of Reduction ⁵	Ongoing Annual Cost per 1000 Gallons of Reduction ⁵
(Insert BMPs selected for implementation.)								
"								
"								
"								
"								
"								
"								
BMP Subtotal								
Passive Savings								
Rate Adjustment								
Leak Detection and Repair								
Grand Totals								

Plan Year 2 through X (Provide a copy of this table for each year covered by the plan.)

Table Notes:

1. Direct costs are for analyses, software, materials, installation, and other items required to physically implement the conservation practice.
2. Overhead costs are for administration of the program required to implement the conservation practice, such as a project manager salary.
3. Operation and maintenance costs are the ongoing annual costs of maintain the conservation practice to assure continued effectiveness.
4. Existing water use, planned water use reduction in, and percent change are for the water used only by the target water user group.
5. Costs per 1000 gallons of water use reduction are calculated from the cost and water use reductions provided in preceding columns.

Table 11. Projected Overall Water Use and Savings (mgd)

[illegible]

IX - Total Water Use Reduction and Cost

The overall anticipated costs and benefits of the water conservation program are summarized in Table 12. This table shows base year water use and projected future water use with and without additional conservation, the amount by which the projected increase is planned to be offset by conservation efforts, and the remaining amount of any increase in water use that must be met from other sources, and the costs of implementing BMPs and supporting measures.

Table 12. Water use reduction and cost summary.

Year	Projected Water Demand for an Average Rainfall Year without Additional Conservation (mgd)	Potential Daily Demand Reduction from Conservation (mgd)	Remaining Increase in Demand to be met by Other Sources (mgd)	Total Cost of Conservation Program (dollars) ¹	Annualized Cost Per 1000 gallons of Demand Reduction (dollars) ¹
Total					

¹Includes all capital, overhead, operation and maintenance costs.

APPENDIX E

- **City of Belleview**
 - **Water Conservation Reuse Survey**
 - **Water Utility Rates**
 - **Landscaping Ordinance**

WATER CONSERVATION SURVEY

Education, Regulation, and Incentives

Do you enforce Water Management District watering restrictions that determine the time and days for outdoor watering? Y / N No

If yes, what are the penalties for violations? Describe _____

Do you have a landscape ordinance that requires Florida Friendly landscaping? Y/N Yes
Land Development Regulation 114-32(2) & 114-33

Do you have staff dedicated to water conservation? Y / N No

Do you participate in any other educational and outreach activities related to water conservation? Describe Water Conservation information is included in all new customer information packets _____

Do you provide water efficient plumbing retrofit kits? These can include low-flow shower heads, low-volume toilets, low-flow faucets, etc No

Do you provide rain sensors for retrofit of irrigation systems? No

Do you regulate construction of wells smaller than 6" in casing diameter? No

Drinking Water

Do you have a utility that provide drinking water to residents? Yes If yes, please provide the rates and fees that you charge for the water. Attached Exhibit 1

If yes, do you perform periodic audits of the distribution system to measure leakage? Yes Y / N

If yes, do you conduct systematic searches for leaks in your distribution system? Yes

If yes, are developments that hook up to your water required to use Florida Friendly landscaping practices? No

If yes, do you send educational materials regarding water conservation to your accounts? Yes Y / N

If yes, do you notify high volume water users that they may be able to reduce their consumption? Yes Y / N

If yes, do you monitor and detect plumbing leaks through meter readings? Yes Y / N

If yes, do you maintain pressure in your distribution system such that leaks and high flow rates are avoided? Yes Y / N

If yes, do you know what your rate of water use is per person? Describe 103.4 gpdc

If yes, do you have projections of your rate of water use per person in the future? Describe 103.4 gpdc

Please provide any readily available maps of existing potable water lines, sizes and interconnect locations. (GIS, CAD, or hard copy format) Exhibit 2

Reuse Water

Do you have a centralized wastewater treatment facility? Yes Y / N

If yes, what are its current flows? .326 mgd

If yes, do you have future flow projections? Describe Exhibit 3

If yes, does it provide reclaimed water? Yes Y / N

If yes, do you have plans to upgrade this facility? Describe As Needed

Do you require dual lines for new development, so that these areas can receive reclaimed water for irrigation when it becomes available? No Y / N

Do you have a recent water/wastewater masterplan? Comp Plan Y / N

Do you have decentralized wastewater treatment facilities (other than septic tanks), such as package plants? No

If yes, please describe _____

If yes, does it provide reclaimed water?

Do you have any future plans with respect to reclaimed water? Describe Use 100% of treated effluent for golf course irrigation

RESOLUTION 08-08

A RESOLUTIN OF THE CITY COMMISSION OF THE CITY OF BELLEVIEW, FLORIDA AMENDING THE FEE SCHEDULE FOR WATER/SEWER RATES; ESTABLISING AN EFFECTIVE DATE TO COMMENCE WITH THE OCTOBER 2008 BILLING.

WHEREAS, the city Commission of Belleview, Florida, is authorized to establish water and sewer rates; and

WHEREAS, Ordinance 03-23 provides that water and sewer rates may be amended by Resolution duly adopted by the City commission of Belleview, Florida, and

WHEREAS, the city commission of Belleview, Florida, desire to increase said rates.

NOW, THEREFORE, BE IT RESOLVED that the city Commission of Belleview, Florida hereby amends Appendix B. Table 3.H. Water and Sewer Service Rates as follows:

	<u>Inside City Limits</u>	<u>Outside City Limits</u>
Water Residential & Commercial		
Water Base Rate	\$9.41	\$14.12
Water 0 – 7000	\$2.08	\$ 3.12
Water 8000-20000	\$2.50	\$ 3.75
Water 21000-30000	\$3.24	\$ 4.86
Water 30000 and up/1000 gallons	\$4.22	\$ 6.33
Irrigation Water		
Water Base Rate	\$9.41	\$14.12
Water 0 – 7000	\$2.50	\$ 3.75
Water 8000-20000	\$3.00	\$ 4.50
Water 21000-30000	\$3.89	\$ 5.84
Water 30000 and up/1000 gallons	\$5.06	\$ 7.59
Sewer Residential & Commercial		
Sewer Base Rate	\$18.00	\$27.00
Sewer 0 – 7000	\$ 2.77	\$ 4.16
Sewer 7000 and up/1000 gallons	\$ 3.38	\$ 5.07
Construction Water		
Water Base Rate	\$12.09	\$12.09
Water per/1000 gallons	\$ 5.06	\$ 5.06

PASSED AND RESOLVED by a _____ vote of the City Commission of the City of Belleview, Florida on _____, 2008.

TAMMY C. MOORE
Mayor/Commissioner

ATTEST:

SANDI McKAMEY, MMC, CPM
City Clerk/Administrator

APPROVED AS TO FORM AND LEGALITY:

Sec. 114-32. - Landscape plan.

Landscape plans shall include existing and proposed vegetation which shall include the type, size, and location of vegetation as well as any irrigation system and construction protection measures to be utilized for the developed site which shall be submitted with the required site plan for development. A landscape plan serves to provide the specific location, size, type, and area for existing and proposed landscaping including buffers as part of the site plan process. For all development subject to this article the following landscape plan requirements shall be met:

- (1) Identify the size, type, category and location (shade tree or ornamental tree) of all replacement and existing trees required to maintain the minimum number of tree inches as required by [section 114-21](#) of this chapter. All replacement trees shall be a minimum of three inches DBH and of Florida Grade #1 or better quality.
- (2) The landscaped plan shall identify the size, type, and category (shade tree or ornamental tree) proposed to be planted and the size, type and location of all shrubs and ground cover to be installed. All proposed shrubs and ground cover species shall also be listed on the Waterwise Florida Landscape lists published by the St. Johns River Water Management District.
- (3) A minimum landscaped area equal to ten percent of the total area allocated for parking, access, loading, dumpster pad, and traffic circulation shall be landscaped through a combination of landscaped islands and perimeter landscaped areas. The landscape plan shall include calculations for these areas and calculations for the amount of required landscaped areas.
- (4) All designated landscaped areas shall be a minimum of 140 square feet in size. Where adjacent to parking or traffic circulation, curbing or other protective barriers shall be required to prevent encroachment and damage by vehicles.
- (5) All shrubs to be installed shall be a minimum size of 24 inches from grade. Shrubs installed within the clear visibility triangle and for other areas where safety may be an issue shrubs shall not exceed a height of 30 inches in parking and traffic circulation areas or where deemed to be a safety hazard.
- (6) The landscaped plan shall include calculations for preservation of existing and proposed trees to meet the minimum tree requirements as indicated in [section 114-31](#) of this article.
- (7) The construction protection measures to be utilized for the developed site, including location and type of protective markers.
- (8) Irrigation systems are not required by the city. However, if provided the system(s) shall be detailed on the landscape plan showing the type(s) of system(s) to be installed.

(Ord. No. 2007-31, § 1, 10-16-2007)

Sec. 114-33. - Landscape plan water conservation and soil protection requirements.

The city recognizes the importance of providing irrigation systems to maintain trees and landscaping. However, there is also a growing need to protect diminishing water resources for both water quality and quantity and to minimize soil erosion during and after site development. The following protection measures shall be addressed on all landscaping plans:

- (1) A plan notation addressing the type of drought tolerant ground cover (grass) to be placed after construction to cover all areas disturbed during construction. There should be no bare soil areas unless part of the approved plans. Seeding and mulching is not permissible as a replacement ground cover.
- (2) A plan notation detailing the irrigation system(s) (if provided) that utilizes water use zones, rain sensor devices, and low-volume drip irrigation to coincide with the selected planting types. The plans shall specify the spray zones, required watering frequency (based upon the planting types).
- (3) A plan notation summarizing the extent that Xeriscape species and/or low-volume micro irrigation is utilized to minimize the overall water consumption needs of the landscape design.
- (4) A plan notation addressing reuse water for irrigation purposes if available and a commitment to provide connection to reuse water if it becomes available to the site. The determination on availability shall be when facilities are within 100 feet from the subject property.
- (5) A plan notation listing the allowable watering days and times as specified by city regulations and a notation that the irrigation system(s) will only be used during those times.

(Ord. No. 2007-31, § 1, 10-16-2007)

APPENDIX F

- **Town of McIntosh**
 - **Water Conservation Reuse Survey**

WATER CONSERVATION SURVEY

Education, Regulation, and Incentives

Do you enforce Water Management District watering restrictions that determine the time and days for outdoor watering? N

If yes, what are the penalties for violations? N/A

Do you have a landscape ordinance that requires Florida Friendly landscaping? N

Do you have staff dedicated to water conservation? N

Do you participate in any other educational and outreach activities related to water conservation? Describe The Town's website provides information regarding water conservation, water restrictions, and related information.

Do you provide water efficient plumbing retrofit kits? These can include low-flow shower heads, low-volume toilets, low-flow faucets, etc N

Do you provide rain sensors for retrofit of irrigation systems? N

Do you regulate construction of wells smaller than 6" in casing diameter? N/A – no new wells.

Drinking Water

Do you have a utility that provides drinking water to residents? Y

If yes, please provide the rates and fees that you charge for the water.

\$9.00 up to 5,000 gallons/month

\$3.75 from 5,000 – 10,000 gallons/month

\$1.00/thousand over 10,000 gallons/month

If yes, do you perform periodic audits of the distribution system to measure leakage? Y

If yes, do you conduct systematic searches for leaks in your distribution system? Y

If yes, are developments that hook up to your water required to use Florida Friendly landscaping practices? N/A – no new developments.

If yes, do you send educational materials regarding water conservation to your accounts? N

If yes, do you notify high volume water users that they may be able to reduce their consumption? N

If yes, do you monitor and detect plumbing leaks through meter readings? Y

If yes, do you maintain pressure in your distribution system such that leaks and high flow rates are avoided? Y

If yes, do you know what your rate of water use is per person? Describe
Over 50% of customers use less than 5,000 gallons/month.

If yes, do you have projections of your rate of water use per person in the future?
Describe Expected to remain unchanged

Please provide any readily available maps of existing potable water lines, sizes and interconnect locations. (GIS, CAD, or hard copy format)

Reuse Water

Do you have a centralized wastewater treatment facility? N
If yes, what are its current flows? _____

If yes, do you have future flow projections? Describe _____

If yes, does it provide reclaimed water?

If yes, do you have plans to upgrade this facility? Describe _____

Do you require dual lines for new development, so that these areas can receive reclaimed water for irrigation when it becomes available?

Do you have a recent water/wastewater masterplan?
If yes, please provide a copy (CD format is fine).

Do you have decentralized wastewater treatment facilities (other than septic tanks), such as package plants?
If yes, please describe _____
If yes, does it provide reclaimed water?

Do you have any future plans with respect to reclaimed water? Describe _____

Please provide any readily available maps of existing reuse water lines, sizes and interconnect locations. (GIS, CAD, or hard copy format)

APPENDIX G

- **City of Ocala**
 - **Water Conservation Reuse Survey**
 - **Water Utility Rates**
 - **Florida Friendly Landscaping Ordinance**

WATER CONSERVATION SURVEY

Education, Regulation, and Incentives

Do you enforce Water Management District watering restrictions that determine the time and days for outdoor watering? Y / **N**

If yes, what are the penalties for violations? Describe _____

Do you have a landscape ordinance that requires Florida Friendly landscaping? Y/**N**

Do you have staff dedicated to water conservation? **Y** / N

Do you participate in any other educational and outreach activities related to water conservation? Describe ____ **Community Events, speakers bureau, schools**

Do you provide water efficient plumbing retrofit kits? These can include low-flow shower heads, low-volume toilets, low-flow faucets, etc **Y** / N

Do you provide rain sensors for retrofit of irrigation systems? Y / **N**

Do you regulate construction of wells smaller than 6" in casing diameter? **Y** / N

Cannot sink a well if re-use is available

Drinking Water

Do you have a utility that provide drinking water to residents? **Y** / N

If yes, please provide the rates and fees that you charge for the water.

If yes, do you perform periodic audits of the distribution system to measure leakage? **Y** / N

If yes, do you conduct systematic searches for leaks in your distribution system?
YES

If yes, are developments that hook up to your water required to use Florida Friendly landscaping practices? **NO**

If yes, do you send educational materials regarding water conservation to your accounts? **Y** / N

If yes, do you notify high volume water users that they may be able to reduce their consumption? Y / **N**

If yes, do you monitor and detect plumbing leaks through meter readings? Y / **N**

If yes, do you maintain pressure in your distribution system such that leaks and high flow rates are avoided? **System monitors pressure** Y / N

If yes, do you know what your rate of water use is per person? Describe

Avg 107

If yes, do you have projections of your rate of water use per person in the future?
Describe __**Mathematical averages to project future consumption**

Please provide any readily available maps of existing potable water lines, sizes and interconnect locations. (GIS, CAD, or hard copy format)

Reuse Water

Do you have a centralized wastewater treatment facility? **Y** three / N
If yes, what are its current flows? _ **#1 5MPG/ #2 3MPG/ #3 2 MPG**

If yes, do you have future flow projections? Describe _**Mathematical projection per Mater Plan**

If yes, does it provide reclaimed water? **Y** / N

If yes, do you have plans to upgrade this facility? Describe __**Per Master Plan**

Do you require dual lines for new development, so that these areas can receive reclaimed water for irrigation when it becomes available? Y / N

Do you have a recent water/wastewater masterplan? **Y** / N

Do you have decentralized wastewater treatment facilities (other than septic tanks), such as package plants? **NO**

If yes, please describe_____

If yes, does it provide reclaimed water?

Do you have any future plans with respect to reclaimed water? Describe __**YES**_____
Continue to offset drinking water with reclaimed water. Interconnect all three wastewater facilities with reclaim water systems.

Municipal Services Statement – Rate Information

New Accounts

All new municipal services accounts will receive their first full bill after the regularly scheduled meter reading is completed. All accounts are billed monthly.

Forced Collection Charge

A forced collection charge shall be assessed to all customers who pay past due charges after the account is scheduled to be cut for non-payment. The charge shall be equal to the reconnection fee for the type of service rendered.

Returned Checks

A 5% charge applies with a \$25.00 minimum.

Electric Service

Residential Service

Service Charge	\$9.33
Energy Charge per kWh (plus or minus BPCA*)	\$0.07921
Utility Tax/Surcharge	10%

General Service/Non-Demand

Service Charge	\$12.22
Energy Charge per kWh (plus or minus BPCA*)	\$0.07903
Utility Tax/Surcharge	10%

General Service / Demand

Utility Tax/Surcharge – Applies to all classifications listed	10%
Less than 150 kVa	
Service Charge	\$24.45
Demand Charge per kVa	\$6.65
Energy Charge per kWh (plus or minus BPCA*)	\$0.05091
150 – 499 kVa	
Service Charge	\$24.45
Demand Charge per kVa	\$7.30
Energy Charge per kWh (plus or minus BPCA*)	\$0.04991
Greater than 499 kVa	
Service Charge	\$24.45
Demand Charge per kVa	\$8.25
Energy Charge per kWh (plus or minus BPCA*)	\$0.04891

Municipal Services Statement – Rate Information

<i>General Service / Demand continued</i>	
General Service – Low Load Factor (not in excess of 200 kVa)	
Service Charge	\$24.08
Demand Charge per kVa	\$0.00
Energy Charge per kWh (plus or minus BPCA*)	\$0.12337

<i>*BPCA – Bulk Power Cost Adjustment</i>
The Bulk Power Cost Adjustment (BPCA) is the fuel component portion of the total energy charge. The BPCA is determined by the price of natural gas and other sources to generate electricity, so the BPCA fluctuates in relation to the price of fuel and is adjusted periodically. Please contact our office at 352-629-2489 for the current rate.

<i>Other Charges</i>	
New Customer Service Charge	\$40.00
New Customer Service Charge Same Day Service after 12 p.m.	\$60.00
Residential Credit Check	\$5.00
Transfer of Service Charge	\$25.00
Same Day Transfer of Service after 12 p.m.	\$60.00
Residential Delinquent Account Reconnect Charge:	
Daytime	\$25.00
After Hours and Weekends	\$50.00

Telecommunications
Please contact us at 352-401-6900 for pricing and availability of:
Commercial Shared Internet
Commercial Internet 1 Meg – 100 Meg
Co-Location Internet 1 Meg – 45 Meg
Committed Bandwidth 10 Meg – 1000 Meg
MAN Connections
Dark Fiber

Water

<i>Residential and Commercial</i>	
Base Rates:	
5/8" Meter	\$9.20
1" Meter	\$28.68
1 – 1/2" Meter	\$52.15
2" Meter	\$116.79
3" Meter	\$220.15
4" Meter	\$265.57
6" Meter	\$408.56
8" Meter	\$598.53

Municipal Services Statement – Rate Information

<i>Water: Residential and Commercial continued</i>	
Consumption Rates:	Per 100 cu. ft.
0 – 1,400 cu. ft.	\$0.72
1,401 – 2,000 cu. ft.	\$1.12
2,001 – 5,000 cu. ft.	\$1.81
5,001 – 10,000 cu. ft.	\$3.63
10,001 cu. ft. and above	\$7.25
Commercial Non-irrigation	\$0.92
Water Availability	\$9.20
Outside of Ocala city limits surcharge	25%

Wastewater

<i>Residential and Commercial</i>	
Residential Base Rates:	
Residential	\$22.32
Special Sewer (single house sewer connection, no water)	\$37.73
Residential Consumption Rate per 100 cu. ft. (Up to a maximum usage of 1,300 cu. ft.)	\$2.18
Commercial Base Rates:	
5/8" Meter	\$32.23
1" Meter	\$114.76
1- 1/2" Meter	\$181.44
2" Meter	\$368.37
3" Meter	\$546.95
4" Meter	\$1,186.50
6" Meter	\$1,536.32
8" Meter	\$2,879.73
Commercial Consumption Rate per 100 cu. ft.	\$2.18
Sewer Availability – Commercial and Residential	\$22.32
Outside of Ocala city limits surcharge	25%

Stormwater

Residential/Commercial-Public Owner	\$5.00/ERU
<i>Public: Serviced entirely by public stormwater facilities.</i>	
Residential/Commercial-Private Owner	\$4.00/ERU
<i>Private: Privately owned and maintained retention facilities.</i>	
One ERU is based on 1,948 square feet of impervious area.	

Municipal Services Statement – Rate Information

Solid Waste

352-629-2489

24-Hour Hotline for Information/Holiday Schedule: 352-351-6698

Holiday schedules are subject to change.

The City of Ocala Public Works Department's Sanitation Division collects residential garbage (excluding yard waste) twice weekly on Mondays and Thursdays or Tuesdays and Fridays. Isolated yard waste and junk are collected once weekly and special wastes such as tires (limit of 2) and appliances are collected when placed at curbside on a regular collection day (fee may apply). Business dumpsters are serviced as volume dictates. Pickup of isolated yard waste or junk and special wastes (such as tires, pallets and appliances) at businesses must be prearranged by calling 352-629-2489.

Sanitation Rates

Curbside Garbage and Loose Yard Waste	\$21.70
Multi-Family Residence	\$15.45
Business Curbside	\$33.75
One-time Additional Residential Cart Charge	
64 gallon cart	\$43.00
96 gallon cart	\$53.00

Special Services: Residential

Per Service

Bulk Collection Labor/Overhead*	\$8.25/qtr. hour
Bulk Collection Disposal*	\$33.00/5 cu. yds
White Good Collection & Disposal	\$12.50 each

**To be charged when necessary to use bulk collection equipment.*

Yard Waste Alerts

Florida State Statutes provide that yard waste must be separated from all other wastes. Yard waste is vegetative; plastic bags are not. Crews will no longer collect yard waste contained in plastic bags, since it is illegal to dispose of it that way. If you choose to contain your yard waste, please use a reusable can, cardboard boxes, or biodegradable paper lawn and leaf bags. You may keep your reusable can for future reuse. Also, ensure that no container weighs more than 50 pounds and that limbs, branches or other trimmings do not exceed four feet in length. Waste cannot be combined.

Private contractors are responsible for removal of waste they generate.

Residents with disabilities who have limited mobility that prevents them from placing their refuse at the curb should call 352-629-2489 for a medical assistance form.

Municipal Services Statement – Rate Information

<i>Commercial Sanitation Services</i>							
The monthly charge for business dumpsters is as follows:							
CU YD	Extra Dumps	Number of Scheduled Services per week					
		1	2	3	4	5	6
2	\$11.17	\$52.10	\$95.99	\$137.79	\$177.50	\$215.12	\$250.65
4	\$20.08	\$88.88	\$167.88	\$243.07	\$314.60	\$382.32	\$446.27
6	\$28.49	\$123.37	\$235.29	\$341.88	\$443.14	\$539.07	\$629.67
8	\$35.75	\$153.25	\$293.70	\$427.46	\$554.53	\$674.92	\$788.61
<i>Compacted municipal solid waste shall be charged three times the applicable rate shown in the table. \$20 service fee for extra dumps.</i>							

<i>Special Services: Commercial</i>	
Minimum Service Fee	
Gate and/or Lock	\$2.35/service
Rerouting or Unscheduled Service	\$20.00/service
Shared Commercial Municipal Solid Waste Container	\$22.22/month
Emergency Service	\$30.00/service
Dumpster with Casters	\$10.00/month
Private Collector Permit Application Fee	\$100.00/year
Private Collector Annual Renewal Permit Fee	\$100.00/year
Permit to Use a Private Collector	\$20.00/year
Additional Disposal Fee per Cart	\$19.44/month

<i>Recycling</i>
<p>The City of Ocala has contracts only for the commodities listed on the brightly colored dumpsters at all standard drop-off centers. Leave only what is requested. In many cases, our drop-off centers are on private property that is owned by civic-minded businesses. Let's all help keep their property litter-free. Drop-off centers are listed below.</p> <ul style="list-style-type: none"> • Wal-Mart - 4980 E Silver Springs Blvd • Recycle Park - 2300 SE 32nd Ave (Jervey Gantt Park) • NE 24th Street Recycle Center - Located behind the Electric Substation (between Fire Station #5 and the Arnette House, 2331 and 2340 NE 24th Street) • Northwest Ocala - 1500 NW Silver Springs Blvd. (Martin Luther King Recreation Complex) • Southwest Ocala - 3001 SW 20th Street (CF North Parking Lot) • SE 31st Street - Between 441 and Lake Weir (Vacant City-Owned Property) • NE 14th Street at 8th Avenue - (Vacant Lot / SW Corner) • Sam's Club - 3921 SW College Road

Municipal Services Statement – Rate Information

Fire Services				
Residential			\$14.30	
Commercial				
<u>Square Feet</u>	<u>Fee</u>		<u>Square Feet</u>	<u>Fee</u>
1 – 2,000	\$14.30		35,001 – 40,000	\$244.95
2,001 – 3,000	\$16.33		40,001 – 45,000	\$277.61
3,001 – 4,000	\$22.86		45,001 – 50,000	\$310.27
4,001 – 5,000	\$29.39		50,001 – 60,000	\$359.26
5,001 – 6,000	\$35.93		60,001 – 70,000	\$424.58
6,001 – 7,000	\$42.46		70,001 – 80,000	\$489.90
7,001 – 8,000	\$48.99		80,001 – 90,000	\$555.22
8,001 – 10,000	\$58.79		90,001 – 100,000	\$620.54
10,001 – 12,000	\$71.85		100,001 – 120,000	\$718.52
12,001 – 14,000	\$84.92		120,001 – 140,000	\$849.16
14,001 – 16,000	\$97.98		140,001 – 160,000	\$979.80
16,001 – 18,000	\$111.04		160,001 – 180,000	\$1,110.44
18,001 – 17,000	\$124.11		180,001 – 200,000	\$1,241.08
20,001 – 25,000	\$146.97		200,001 – 250,000	\$1,469.69
25,001 – 30000	\$179.63		250,001 – 300,000	\$1,796.29
30,001 – 35,000	\$212.29		300,001 and greater	\$1,959.59

Contact Information

Citizen Service Center

201 SE 3rd Street - 1st Floor

Ocala, FL 34471-2174

352-629-CITY (2489)

1-800-893-4760

OUS@ocalafl.org

Business Hours for the Lobby are 8 a.m. to 5 p.m.

Monday through Friday, excluding holidays

Business Hours for the Drive-Thru are 7:30 a.m. to 6 p.m.

Monday through Friday, excluding holidays

Ocala, Florida, Code of Ordinances >> PART II - CODE OF ORDINANCES >> Chapter 118 - TREES, LANDSCAPING AND OTHER VEGETATION >> ARTICLE III. - LANDSCAPING AND SITE RESTORATION >>

ARTICLE III. - LANDSCAPING AND SITE RESTORATION

Sec. 118-131. - Site restoration plan.

Sec. 118-132. - Landscaping and open space requirements generally.

Sec. 118-133. - Landscaping, streetscape and open space requirements for community redevelopment area.

Sec. 118-134. - Required soil conservation measures.

Sec. 118-135. - Parking area screening and interior landscaping.

Sec. 118-136. - Disposal of removed trees and vegetation.

Sec. 118-137. - Florida friendly fertilizer use on city landscape.

Sec. 118-131. - Site restoration plan.

- (a) *Purpose.* The primary consideration of a restoration plan shall be to return the affected portion of the site to its natural state, or, if that is impossible, to counterbalance the negative effect of the violation over the entire site to the greatest extent possible.
- (b) *Submission; review by planning and zoning commission.*
- (1) When a restoration plan is required, a suitable restoration plan must be submitted to the planning and zoning commission within 30 days of notification by the building department to the owner, developer, subcontractor or agent of a violation.
 - (2) The restoration plan must be submitted to the zoning and planning departments a minimum of three working days before the planning and zoning commission meeting in which the restoration plan is to be reviewed, to allow staff time to review and comment on the proposed restoration plan.
 - (3) City council shall establish by separate resolution a minimum fee schedule for a tree restoration plan. The fee is to be paid at the building department. No restoration plan will be reviewed until the fee is paid.
 - (4) Failure to submit a suitable restoration plan within 30 days to the planning and zoning commission is a violation of this article.
- (c) *Form and contents; number of replacement trees.*
- (1) The restoration plan shall be incorporated into an approved site plan or as-built plan, or otherwise drawn in a manner acceptable to the planning director.
 - (2) The type, size and location of all trees removed without or in violation of tree removal permits and any unapproved grade changes shall be shown on the restoration plan.
 - (3) The type, size, number and location of all replacement shade trees and other vegetation to be planted on the site to replace what was unlawfully removed shall be shown on the restoration plan.
 - (4) The diameter of the removed trees shall be calculated and put on the restoration plan.
 - (5) Replacement shade trees of a minimum three and one-half inch caliper (two and one-half inch to three inch DBH) will be planted to make up for the diameter of the trees removed. The diameters of the replacement shade trees added together will equal or exceed the total diameters of the removed trees. If the required replacement shade trees cannot be placed on the property due to size restrictions, they will be donated to the city for placement on public lands for the benefit of the entire community.
 - (6) When unapproved grading occurs, the existing elevations and the finished elevations must be shown on the restoration plan.
- (d) *Implementation of plan.* After the restoration plan has been approved by the planning and zoning commission, the owner shall have 30 days to implement the plan. Failure to implement an approved restoration plan is a violation of this article.
- (1) Tree replacement and vegetation replacement must be inspected and approved by the planning director or his agent.
 - (2) Changes in grading, excavations or berming specified in the restoration plan must be inspected and approved by the planning director in consultation with the city engineer.

- (e) *Approval of plans involving historic property.* If a violation requiring a restoration plan occurs on property that is designated under the historic preservation code (chapter 94), the restoration plan must be submitted to the historic preservation advisory board for a recommendation to the planning and zoning commission. The restoration plan shall be presented to the historic preservation advisory board at a regular scheduled meeting, or, at the discretion of the planning director, after consultation with the chairperson and vice-chairperson of the historic preservation advisory board, at a special meeting of the historic preservation advisory board.
- (f) *Additional review criteria.* Additional factors to be considered by the planning and zoning commission when reviewing a restoration plan include:
 - (1) The specific aesthetic character of the material removed.
 - (2) Any special function the material carried out as a screen or buffer.
 - (3) The amount of the other natural material preserved on the site, and the opportunities for planting additional materials.

(Code 1985, § 7-1128; Ord. No. 2117, § 2, 10-24-89; Ord. No. 5005, § 6, 11-27-01; Ord. No. 5720, § 5, 9-18-07)

Sec. 118-132. - Landscaping and open space requirements generally.

The following shall apply to areas other than the community redevelopment area (CRA):

- (1) *Landscape/open space plan; minimum landscaped open space.* Where a building permit and site plan approval are being sought, the applicant shall submit a general landscape/open space plan in conjunction with the site plan. The minimum landscaped open space for an individual parcel or development, including setbacks, shall be as follows: 12 percent for sites less than 25,000 square feet, 15 percent for sites 25,000 square feet up to one acre, and 20 percent for sites one acre or larger. Open space requirements for the office park (OP) district shall be 25 percent.
- (2) *Irrigation.* Sites one acre or larger in area shall have a properly installed irrigation system to give 100 percent coverage to all landscaped areas through the establishment period. Landscaped areas on sites smaller than one acre shall have a properly installed irrigation system to give 100 percent coverage of the landscaped area, or use proper planting, maintenance and water conservation measures such as native or drought-tolerant vegetation to ensure the healthy survival of all sod, ground cover, shrubs and trees. A landscape plan shall be submitted with every site plan showing the irrigation system or the alternative use of native or drought-tolerant vegetation.

(Code 1985, § 7-1129; Ord. No. 2117, § 2, 10-24-89; Ord. No. 2273, § 1, 4-28-92; Ord. No. 5005, § 7, 11-27-01)

Sec. 118-133. - Landscaping, streetscape and open space requirements for community redevelopment area.

- (a) Open space requirements for the central business district are as follows:
 - (1) The streetscape shall be improved in the public right-of-way adjoining any proposed development. For purposes of this subsection, proposed development means the construction of a new building on a vacant or previously used site requiring a site plan review. The city shall have the right to require the type, quantity and size of streetscape improvements during the site plan review process. The criteria for the improvements shall be based on the city's downtown landscape program. All streetscape improvements throughout the CRA shall require a dripline irrigation system; and
 - (2) For all new developments in the B-3 district, an area equal to five percent of the total lot size shall be devoted to an urban open space area; or
 - (3) In lieu of subsections (a)(1) and (2) of this section, all new developments in the B-3 district will be required to pay a fee to the city. The fee will be used throughout the CRA to create urban open space parks or areas or to upgrade the streetscape program along identified rights-of-way. The fee for each development will be based on one percent of the cost of the proposed development or a maximum of \$5,000.00, whichever is lower.
- (b) The minimum landscaped open space for an individual parcel or development in the B-3A, B-3B and B-3C districts shall be as follows: ten percent for sites less than 25,000 square feet, 12 percent for sites 25,000 square feet up to one acre, and 15 percent for sites one acre or larger. Any streetscape improvements in the right-of-way of the proposed development shall be considered as part of the required open space for that particular site. All landscaped areas shall have a properly installed irrigation system to give 100 percent coverage of the landscaped area, or use proper planting, maintenance and water conservation measures such as native or drought-tolerant vegetation to ensure the healthy survival of all sod, ground cover, shrubs and trees. A landscape plan shall be submitted with every site plan showing the irrigation system or the alternate use of native or drought-tolerant vegetation.

(Code 1985, § 7-1129.1; Ord. No. 2273, § 2, 4-28-92)

Sec. 118-134. - Required soil conservation measures.

The following soil conservation measures shall be taken on all construction sites as required:

- (1) *Protection during construction.* The contractor shall follow standard practices for erosion control that meet or exceed water management district regulations. This shall include the protection of bare soils from wind forces.
- (2) *Protection after construction.* All disturbed areas shall be mulched, seeded or sodded as required by the city engineer, and shall be maintained as such. The removal or lack of maintenance of vegetation resulting in on-site and off-site erosion or wind-blown loss of soils shall be deemed a violation of this article.

(Code 1985, § 7-1130; Ord. No. 2117, § 2, 10-24-89)

Sec. 118-135. - Parking area screening and interior landscaping.

- (a) All off-street parking areas shall be screened from the bordering streets with a minimum of five feet of landscaped buffer strip between the parking area and the bordering street, excluding sidewalks, driveways or necessary appurtenances. This five-foot strip shall have a minimum three-foot-high continuous hedge or acceptable alternative as approved by the planning director.
- (b) All parking areas and other paved ground surface areas used for vehicular parking and access shall have interior landscaping to provide visual and climatic relief from broad expanses of pavement and to channelize and define logical areas for pedestrian and vehicular circulation.
- (c) Interior landscaping shall account for a minimum of ten percent of parking areas. Parking areas include parking spaces and vehicular access aisles including the driveway from the adjacent right-of-way. Interior landscaping will be placed within the perimeter of the parking area.
- (d) Paved areas other than parking areas shall have one square foot of interior landscaping for each 50 square feet of pavement in all areas exceeding 5,000 square feet.
- (e) Each separate interior landscape area shall contain at least one shade tree. Each shade tree will be planted in a landscape/open space area that will be no smaller than 360 square feet, with a minimum width of six feet as measured from inside of curb to inside of curb.
- (f) All interior landscaping shall be protected from vehicular encroachment by curbing or wheel stops. Landscaping dividing strips, with or without walkways, shall be used to subdivide parking areas into parking bays with not more than 40 spaces. No more than ten of these spaces shall be in an uninterrupted row.
- (g) The soil within planting areas and landscaped islands and peninsulas shall be sufficient to be reasonably expected to support the healthy growth of trees and other landscape material. This will require removal of all material used in construction of parking lots and buildings and may require site preparation measure and/or amendments to the soil medium.

(Code 1985, § 7-1131; Ord. No. 2117, § 2, 10-24-89; Ord. No. 2273, § 3, 4-28-92; Ord. No. 5005, § 8, 11-27-01)

Cross reference— Stopping, standing and parking generally, § 66-61 et seq.; off-street parking and loading, § 122-981 et seq.

Sec. 118-136. - Disposal of removed trees and vegetation.

The city council recognizes that wood is a valuable resource that can be used for fuel and in the manufacture of a wide range of products. The city encourages transplanting of trees. The city council further recognizes that the burning of trees on a construction site not only wastes the wood but also produces smoke and releases carbon dioxide into the atmosphere, which contributes to the "greenhouse effect." Hauling away trees to the county landfill disrupts the process of decomposition and delays or even prohibits the return to nature of the nutrients and energy stored in the wood. It is therefore the policy of the city to encourage developers to make wise use of the trees that have to be removed during construction. In furtherance of this policy, the city building department is instructed to compile a list of businesses within the city and the county that buy cut trees. During the site plan review process, the director of building, zoning and licensing will assist communication between the developer and prospective buyers of the wood in an effort to encourage the beneficial use of the removed trees. Developers will be encouraged to dispose of trees and vegetation that cannot be sold in a compost landfill instead of the county landfill.

(Code 1985, § 7-1132; Ord. No. 2117, § 2, 10-24-89)

Sec. 118-137. - Florida friendly fertilizer use on city landscape.

- (a) *Short title.* This section shall be known and may be referred to as the City of Ocala Ordinance for Florida Friendly Fertilizer Use on City Landscape.
- (b)

Authority. This section is adopted by the city under its home rule powers, its police powers to protect the public health, safety, and welfare, and under powers pursuant to the authority granted by F.S. ch. 166, in order to implement and enforce the standards, rules, and regulations set forth herein.

- (c) *Findings.* As a result of impairment to Marion County's surface waters caused by excessive nutrients referred to in the Florida Impaired Waters Rule (Chapter 62-303, FAC), or, as a result of increasing levels of nitrogen in the surface or ground water within the aquifers or springs within the boundaries of or in the proximity of the city, the city council has determined that the use of fertilizers on lands within the city create a particularly high risk to contributing to adverse effects on surface or ground water. Accordingly, the city council finds that more restrictive measures than are otherwise required by the most recent edition of the "Florida Green Industries Best Management Practices for Protection of Water Resources in Florida, June 2002" shall be required by this section.
- (d) *Purpose and intent.* This section: regulates the proper use of fertilizers by any applicator; requires proper training of commercial and institutional fertilizer applicators; establishes training and licensing requirements; specifies allowable fertilizer application rates and methods, fertilizer-free zones, low maintenance zones, and exemptions. The section requires the use of best management practices which provide specific management guidelines to minimize negative secondary and cumulative environmental effects associated with the misuse of fertilizers.
- (e) *Definitions.* For this section, the following terms shall have the following meanings unless the context clearly indicates otherwise.
 - (1) *Application or apply* means the actual physical deposit of fertilizer to turf or landscape plants.
 - (2) *Applicator* means any person who applies fertilizer on turf or landscape plants in the city.
 - (3) *Best management practices* means turf and landscape practices or combination of practices based on research, field testing, and expert review, determined to be the most effective and practicable on-location means, including economic and technological considerations for improving water quality, conserving water supplies and protecting natural resources.
 - (4) *Building official* means the city building official, or the department or official of the city designated by the city manager to enforce the provisions of this section.
 - (5) *City-approved best management practices training program* means a training program established or approved by the city building official that includes, at a minimum, the most current version of the DEP's "Florida Green Industries Best Management Practices for Protection of Water Resources in Florida, June 2002," as revised and any more stringent requirements set forth in this section.
 - (6) *City council* means the City Council of the City of Ocala, Florida.
 - (7) *Code enforcement officer* has the same meaning as set forth in section 2-402 of this Code.
 - (8) *Commercial fertilizer applicator* means any person who applies fertilizer in the city for payment or other consideration to property not owned by the person applying the fertilizer or the employer of such person; such term shall not include a residential applicator.
 - (9) *DACS* means the Florida Department of Agriculture and Consumer Services.
 - (10) *DEP* means the Florida Department of Environmental Protection.
 - (11) *Fertilize, fertilizing, or fertilization* means the act of applying fertilizer to turf, specialized turf, or landscape plant.
 - (12) *Fertilizer* means any substance or mixture of substances, except pesticide/fertilizer mixtures such as "weed and feed" products, that contains one or more recognized plant nutrients and promotes plant growth, or controls soil acidity or alkalinity, or provides other soil enrichment, or provides other corrective measures to the soil.
 - (13) *Guaranteed analysis* means the percentage of plant nutrients or measures of neutralizing capability claimed to be present in a fertilizer.
 - (14) *Landscape plant* means any native or exotic tree, shrub, or groundcover (excluding turf).
 - (15) *Low maintenance zone* means an area a minimum of six feet wide adjacent to water course which is planted and managed in order to minimize the need for fertilization, water, mowing, etc.
 - (16) *Pasture* means land used for livestock grazing that is managed to provide feed value.
 - (17) *Person* means any natural person, business, corporation limited liability company, partnership, limited partnership, association, club, organization, or any group of people acting as an organized entity.
 - (18) *Residential applicator* means any person who applies fertilizer on turf or landscape plants in the city to property upon which such person's principal residence is located.
 - (19) *Slow release, controlled release, time release, slowly available, or water insoluble nitrogen* means nitrogen in a form which delays its availability for plant uptake and use after application, or which extends its availability to the plant longer than a reference rapid or quick release product.
 - (20) *Specialized turf* means a golf course or athletic field.
 - (21) *Turf, sod, or lawns* means a piece of grass-covered soil held together by the roots of the grass.

(f)

Applicability. This section shall be applicable to and shall regulate any and all applicators of fertilizer and areas of application of fertilizer within the municipal limits of the city, unless such applicator is specifically exempted by the terms of this section from any regulatory provisions of this section.

(g) Fertilizer content and application rates.

- (1)** Fertilizers applied to turf or landscape plants within the city shall be applied in accordance with directions provided by Rule 5E-1.003, FAC, Labeling Requirements for City Turf Fertilizers.
- (2)** Fertilizers should be applied to turf or landscape plants at the lowest rate necessary. Nitrogen shall not be applied at an application rate greater than 0.7 lbs of readily available nitrogen per 1,000 square feet at any one time based on the soluble fraction of formulated fertilizer, with no more than one pound total nitrogen per 1,000 square feet applied at any one time, and not to exceed the nitrogen recommendation set forth below on an annual basis.

GRASS SPECIES	MAXIMUM N APPLICATION RATE (Lbs/1,000 ft ² /Yer)
Bahia grass	3
Bermuda grass	4
Centipede grass	2
St. Augustine grass	4
Zoysia grass	4

- (3)** For new turf or landscape plants that are being installed or established, a one-time use of starter fertilizer as described in Rule 5E-1.003, FAC shall be allowed at an application rate not to exceed 1.0 pounds of phosphorus (P₂O₅) per 1,000 square feet.
- (4)** No phosphorus fertilizer shall be applied to existing turf or landscape plants within the city at application rates which exceed 0.25 pounds phosphorus per 1,000 square feet per application nor exceed 0.50 pounds phosphorus per 1,000 square feet per year.
- (5)** Nitrogen or phosphorus fertilizer may not be applied to turf or landscape plants except as provided above unless a soil or tissue deficiency has been verified by an approved test by UF/IFAS Extension Soil Testing Laboratory or other accredited laboratory.
- (h) Impervious surfaces.** Fertilizer shall not be applied, spilled, or otherwise deposited on any impervious surfaces. Any fertilizer applied, spilled, or deposited, either intentionally or accidentally, on any impervious surface shall be immediately and completely removed to the greatest extent practicable. Fertilizer released on an impervious surface must be immediately contained and either legally applied to turf or any other legal site, or returned to the original or other appropriate container. In no case shall fertilizer be washed, swept, or blown off impervious surfaces into stormwater drains, ditches, conveyances, or water bodies.
- (i) Fertilizer free zones.** Fertilizer shall not be applied within ten feet, or three feet if a deflector shield or drop spreader is used, of any pond, stream, water course, lake, canal, or wetland (as defined by DEP in Chapter 62-340, FAC), or from the top of any seawall. Newly planted turf or landscape plants may be fertilized in this zone only for the first 60-day establishment period.
- (j) Low maintenance zones.** A voluntary six (6) foot low maintenance zone is strongly recommended, but not mandated, from any pond, stream, water course, lake, wetland or from the top of a seawall. A swale/berm system is recommended for installation at the landward edge of this low maintenance zone to capture and filter runoff. It is strongly recommended, but not mandated, that no mowed or cut vegetative material shall be deposited or left remaining in this zone or deposited in the water, and that care should be taken to prevent the over-spray of aquatic weed products in this zone.
- (k) Mode of application.** Spreader deflector shields are required when fertilizing via rotary spreaders. Deflectors must be positioned such that fertilizer granules are deflected away from all impervious surfaces, fertilizer free zones and water bodies, including wetlands.
- (l) Management of grass clippings and vegetative matter.** In no case shall grass clippings, vegetative material, or vegetative debris either intentionally or accidentally, be washed, swept, or blown off into stormwater drains, ditches, conveyances, water bodies, wetlands, or sidewalks or roadways.
- (m) Exemptions.** The provisions set forth above in this section shall not apply to:
 - (1)** Bona fide farm operations as defined in the Florida Right to Farm Act, F.S. § 823.14, provided that fertilizers are applied in accordance with the appropriate Best Management Practices Manual adopted by the FACS, Office of Agricultural Water Policy, for the crop in question.

- (2) Other properties not subject to or covered under the Florida Right to Farm Act that have pastures used for grazing livestock provided that fertilizers are applied in accordance with the appropriate Best Management Practices Manual adopted by the DACS, Office of Agricultural Water Policy for the crop in question.
- (n) *Training.*
- (1) All applicators of fertilizer within the city, other than residential applicators, shall successfully complete the training in minimizing nitrogen leaching and phosphorus runoff from fertilizer applications necessary to obtain a "limited certification for urban landscape commercial fertilizer application" pursuant to F.S. § 482.1562, within six months of when training for such certification under the DACS program therefor becomes available. Commercial fertilizer applicators shall provide proof of completion of the approved training program to the building official prior to the expiration of the time period set forth above.
- (2) The city may establish or approve a city-approved best management practices training program for residential applicators, and may encourage residential applicators to participate in such program.
- (o) *Certification of applicators.*
- (1) All applicators of fertilizer within the city, including commercial applicators and other applicators employed by a business or governmental entity and applying fertilizer to property owned by the business or governmental entity (such as golf courses, commercial properties, and multi-family and condominium properties), other than residential applicators, shall obtain, and thereafter maintain, a "limited certification for urban landscape commercial fertilizer application" pursuant to F.S. § 482.1562, within six months of when certification under the DACS program therefor becomes available. Such applicators shall provide proof of such certification to the building official prior to the expiration of the time period set forth above.
- (2) Residential applicators of fertilizer within the city shall follow the recommendations of the University of Florida IFAS Florida Yards and Neighborhoods program when applying fertilizers.
- (3) Any person required to be certified under this subsection (o) shall provide proof of renewal of such certification prior to the expiration of the original certification and, in any event, within ten days of a written request therefor from the building official.
- (p) *Enforcement.* Every code enforcement officer shall, in connection with all other duties imposed by law, be authorized to enforce the provisions of this section. In addition, the city manager may also delegate enforcement responsibility for this section to agencies and departments of the city government.
- (q) *Penalties.*
- (1) Violation of any provision of this section shall be subject to the following penalties:
- a. First violation: Written notification and education.
- b. Second violation: \$50.00.
- c. Third and subsequent violation(s): \$100.00.
- (2) Each day of violation of this section within a 365-day period, beginning the date of the first violation, shall constitute a separate offense. The city may take any other appropriate legal action, including but not limited to emergency injunctive action, to enforce the provisions of this section.

(Ord. No. 6000, § 1(Exh. A), 7-23-09)

APPENDIX H

- **Marion County Utilities**
 - **Water Conservation Reuse Survey**
 - **Water Utility Rates**
 - **2011-2012 Water Conservation Plan**

WATER CONSERVATION SURVEY

Education, Regulation, and Incentives

Do you enforce Water Management District watering restrictions that determine the time and days for outdoor watering? **Y** / **N**

If yes, what are the penalties for violations? Describe

1st offense- letter

2nd offense- letter

3rd offense- \$50 fine

Do you have a landscape ordinance that requires Florida Friendly landscaping? **Y/N**
“However it is encouraged”

Not all principals are required, but our Land Development Code incorporates portions of FFL into its “Marion Friendly” requirements.

Do you have staff dedicated to water conservation? **Y** / N

Do you participate in any other educational and outreach activities related to water conservation? Describe

- Participation in public events (booth and/or powerpoint) as requested
- Micro-irrigation workshops and free kit offer to 55+ communities

Do you provide water efficient plumbing retrofit kits? These can include low-flow shower heads, low-volume toilets, low-flow faucets, etc **Y** / N

Do you provide rain sensors for retrofit of irrigation systems? **Y** / N
These are available through our landscape irrigation audit program

Do you regulate construction of wells smaller than 6” in casing diameter? **Y** / **N**
This is Department of Health

Drinking Water

Do you have a utility that provides drinking water to residents? **Y** / N
If yes, please provide the rates and fees that you charge for the water.

If yes, do you perform periodic audits of the distribution system to measure leakage? **Y** / N

If yes, do you conduct systematic searches for leaks in your distribution system?
Yes

If yes, are developments that hook up to your water required to use Florida Friendly landscaping practices? **No, however it is encouraged.**

If yes, do you send educational materials regarding water conservation to your accounts? **Y** / N

If yes, do you notify high volume water users that they may be able to reduce their consumption? **Y** / N

If yes, do you monitor and detect plumbing leaks through meter readings? **Y** / N

If yes, do you maintain pressure in your distribution system such that leaks and high flow rates are avoided? **Y** / N

If yes, do you know what your rate of water use is per person? Describe **East of I-75 111 Gallons West of I-75 150 Gallons**

If yes, do you have projections of your rate of water use per person in the future? Describe **Under 150 gallons**

Please provide any readily available maps of existing potable water lines, sizes and interconnect locations. (GIS, CAD, or hard copy format)

Kim: Please see your email from Susan Heyen 10-20-11 2:56 PM for maps layers

Reuse Water

Do you have a centralized wastewater treatment facility? **Y** / N

If yes, what are its current flows? **All Plants 2,400,000**

If yes, do you have future flow projections? Describe **No**

If yes, does it provide reclaimed water? At some Plants, **Oak Run, Stone Crest**

If yes, do you have plans to upgrade this facility? **Describe the above just finished upgrades**

Do you require dual lines for new development, so that these areas can receive reclaimed water for irrigation when it becomes available? **Only to golf courses**
Y / N

Do you have a recent water/wastewater masterplan? **Y** / N

Do you have decentralized wastewater treatment facilities (other than septic tanks), such as package plants? **Yes**

If yes, please describe, **Marion County has 9 Active waste water plants from 24,000 to 1,600,000 gallons per day**

If yes, does it provide reclaimed water? **Only from 2 plants at this point .**

Do you have any future plans with respect to reclaimed water? Describe **To expand reuse to more communities**

RESOLUTION 09-R- 87

A RESOLUTION OF THE BOARD OF COUNTY COMMISSIONERS OF MARION COUNTY, FLORIDA; SETTING FORTH A PRELIMINARY SCHEDULE FOR UTILITY RATES, FEES, AND CHARGES; PROVIDING A TITLE; PROVIDING FINDINGS; ESTABLISHING REUSE WATER SUPPLY RATES; ESTABLISHING BULK WATER AND WASTEWATER SUPPLY RATES; ESTABLISHING FEES FOR CONSTRUCTION, TEMPORARY USE, TANKER REFILL AND OTHER INTERIM USE WATER CUSTOMERS; ESTABLISHING WATER METER INSTALLATION CHARGES; ESTABLISHING METER TESTING CHARGES; ESTABLISHING RECONNECTION FEES; ESTABLISHING RETURNED CHECK FEE; ESTABLISHING FEES FOR LATE PAYMENT; ESTABLISHING INITIAL SERVICE DEPOSITS; ESTABLISHED ANNUAL FIRE LINE CHARGES; ESTABLISHING AN AVAILABILITY LETTER FEE; ESTABLISHING A UTILITY FACILITY PERMIT FEE; ESTABLISHING SERVICE CONNECTION CHARGES; ESTABLISHING FEES FOR TRANSFER OF SERVICE ACCOUNT; PROVIDING EMERGENCY SERVICE TURN-ON AND TURN-OFF FEES; ESTABLISHING FEES FOR AFTER HOUR SERVICE CALLS; ESTABLISHING INSPECTION FEES; ESTABLISHING METER TAMPERING OR THEFT OF SERVICE FEES; ESTABLISHING SERVICE TAP; ESTABLISHING FEES TO LOCATE SEWER SERVICE LATERAL; ESTABLISHING A METER RELOCATION FEE; PROVIDING FOR REIMBURSEMENT OF COSTS TO PROCESS DEVELOPER RELATED AGREEMENTS; PROVIDING FEES FOR ACCOUNT REPORTING AND DOCUMENT RESEARCH; ESTABLISHING FEES FOR PLAN REVIEW; ESTABLISHING ANNUAL FIRE HYDRANT MAINTENANCE FEES; PROVIDING FOR TERMS OF PAYMENT; PROVIDING FOR REIMBURSEMENT FOR EXTRA EXPENSES; PROVIDING FOR REPEAL OF CONFLICTING PROVISIONS OF PAST RESOLUTIONS; PROVIDING FOR ANNUAL ADJUSTMENT OF FEES; PROVIDING FOR SEVERABILITY; PROVIDING AN EFFECTIVE DATE.

BE IT RESOLVED BY THE BOARD OF COUNTY COMMISSIONERS OF MARION COUNTY, FLORIDA (THE "BOARD") THAT:

SECTION 1. TITLE. This Resolution was enacted in connection with, and its amendment is authorized by, the Water and Wastewater Utility Rate Ordinance, and shall be entitled the "Consolidated Water, Wastewater and Reuse Service Rate Resolution."

SECTION 2. BOARD FINDINGS. In adopting this Resolution and the rates, fees, and charges incorporated herein, the Board of County Commissioners of Marion County hereby makes and expresses the following findings, purposes and intent:

(1) The Board has the duty, right, power and authority to establish and adopt by resolution a water system rate schedule which shall apply to each customer of the County's water system.

(2) The Board has the duty, right, power and authority to establish and adopt by resolution a wastewater system rate schedule which shall apply to each customer of the County's wastewater system.

(3) Pursuant to applicable law and its home rule authority, the Board has authority to establish certain rates, fees and charges to be paid to the County in connection with its water and wastewater systems.

(4) The establishment of certain rates, fees and charges by Resolution is contemplated in that certain ordinance entitled the "Water and Wastewater Utility Rate Ordinance" approved by the Board on or about September of 1996, as amended from time to time.

(5) The rates, fees and charges established herein provide funding for water and wastewater utility services which promote the health, safety, and general welfare of its customers and is therefore beneficial to the rate payers of the County's water and wastewater system.

(6) The Board previously adopted Resolutions 96-R-280, 96-R-312, 98-R-111, 99-R-216, 01-R-26, 03-R-209, 04-R-43, 07-R-187A, and 07-R-

436 (the "Resolutions") to establish and amend the rates, fees, and charges associated with the County's water and wastewater system.

(7) The County has held the necessary public hearings to review the rate study to determine the reasonableness of modified rates and charges as directed by the Board and has presented the final study to the Board for final approval along with the resulting recommended rates and charges for water and wastewater services based thereon.

SECTION 3. WATER SYSTEM RATE SCHEDULE FOR ALL COUNTY UTILITY CUSTOMERS EXCEPT FOR THOSE IN SILVER SPRINGS REGIONAL WATER SYSTEM SERVICE AREAS. Pursuant to the Water and Wastewater Utility Rate Ordinance, the Board hereby establishes and adopts the Water System Rate Schedule set forth in Tables 3-1 and 3-2 below for all County water customers except for those in the Silver Springs Regional Water and/or Wastewater System service area, or any bulk customers.

**Table 3-1
Countywide Base Facility Charges (Per Service)**

Effective Date	4/3/2009	1/1/2010	10/1/2010	10/1/2011	10/1/2012
Meter Size					
3/4"	\$ 11.94	\$ 12.54	\$ 13.17	\$ 13.43	\$ 13.70
1"	\$ 29.85	\$ 31.34	\$ 32.91	\$ 33.57	\$ 34.24
1.5"	\$ 59.70	\$ 62.69	\$ 65.82	\$ 67.14	\$ 68.48
2"	\$ 95.52	\$ 100.29	\$ 105.30	\$ 107.41	\$ 109.56
3"	\$ 191.05	\$ 200.60	\$ 210.63	\$ 214.84	\$ 219.14
4"	\$ 298.50	\$ 313.43	\$ 329.10	\$ 335.68	\$ 342.39
6"	\$ 597.01	\$ 626.86	\$ 658.20	\$ 671.36	\$ 684.79
8"	\$ 955.23	\$ 1,002.99	\$ 1,053.14	\$ 1,074.20	\$ 1,095.68

The Gallonage Charge for such Water System Rates shall be calculated based on the applicable Usage Block set forth in the Table 3-2 below:

Table 3-2

Countywide Water Gallonage Charges (Per Service)

Effective Date				4/3/2009	1/1/2010	10/1/2010	10/1/2011	10/1/2012
Residential				Rate / 1,000	Rate / 1,000	Rate / 1,000	Rate / 1,000	Rate / 1,000
	Use (GAL)			GAL	GAL	GAL	GAL	GAL
Block 1	1	-	6,000	\$ 1.12	\$ 1.18	\$ 1.24	\$ 1.26	\$ 1.29
Block 2	6,001	-	12,000	\$ 1.50	\$ 1.58	\$ 1.66	\$ 1.69	\$ 1.72
Block 3	12,001	-	20,000	\$ 2.63	\$ 2.76	\$ 2.90	\$ 2.96	\$ 3.02
Block 4	20,001	-		\$ 5.26	\$ 5.52	\$ 5.80	\$ 5.92	\$ 6.04
Non-Residential				Rate / 1,000	Rate / 1,000	Rate / 1,000	Rate / 1,000	Rate / 1,000
	Use (GAL)			GAL	GAL	GAL	GAL	GAL
Block 1	All Use			\$ 1.50	\$ 1.58	\$ 1.66	\$ 1.69	\$ 1.72
Irrigation				Rate / 1,000	Rate / 1,000	Rate / 1,000	Rate / 1,000	Rate / 1,000
	Use (GAL)			GAL	GAL	GAL	GAL	GAL
Block 1	1	-	20,000	\$ 2.63	\$ 2.76	\$ 2.90	\$ 2.96	\$ 3.02
Block 2	20,001	-		\$ 5.26	\$ 5.52	\$ 5.80	\$ 5.92	\$ 6.04

SECTION 4. WATER SYSTEM RATE SCHEDULE FOR COUNTY
UTILITY CUSTOMERS IN SILVER SPRINGS REGIONAL WATER SYSTEM
SERVICE AREA.

Pursuant to the Water and Wastewater Utility Rate Ordinance, the Board hereby establishes and adopts the Water System Rate Schedule set forth in Tables 4-1 and 4-2 below for all water customers in the Silver Springs Regional Water service areas.

Table 4-1

Silver Springs Regional Base Facility Charges (Per Service)

Effective Date	4/3/2009	1/1/2010	10/1/2010	10/1/2011
Meter Size				
3/4"	\$ 8.65	\$ 10.12	\$ 11.84	Equals County Rate Structure
1"	\$ 19.42	\$ 22.72	\$ 26.58	
1.5"	\$ 35.31	\$ 41.31	\$ 48.33	
2"	\$ 82.22	\$ 96.19	\$ 112.54	
3"	\$ 160.38	\$ 187.65	\$ 219.55	
4"	\$ 226.99	\$ 265.58	\$ 310.73	
6"	\$ 417.06	\$ 487.96	\$ 570.91	
8"	\$ 691.70	\$ 809.29	\$ 946.87	

The Gallonage Charge for such Water System Rates shall be calculated based on the applicable Usage Block set forth in the Table 4-2 below:

Table 4-2

Silver Springs Regional Water Gallonage Rates (Per Service)

Effective Date	4/3/2009	1/1/2010	10/1/2010	10/1/2011
Residential	<u>Rate / 1,000</u>	<u>Rate / 1,000</u>	<u>Rate / 1,000</u>	Equals County Rate Structure: (Blocks & Rates)
	<u>Use (GAL)</u>	<u>GAL</u>	<u>GAL</u>	
Block 1	1 - 6,000	\$ 1.16	\$ 1.40	
Block 2	6,001 - 10,000	\$ 1.56	\$ 1.88	
Block 3	10,001 - 13,000	\$ 1.77	\$ 2.14	
Block 4	13,001 -	\$ 2.04	\$ 2.46	
Non-Residential	<u>Rate / 1,000</u>	<u>Rate / 1,000</u>	<u>Rate / 1,000</u>	
	<u>Use (GAL)</u>	<u>GAL</u>	<u>GAL</u>	
Block 1	1 - 6,000	\$ 1.16	\$ 1.40	
Block 2	6,001 - 10,000	\$ 1.56	\$ 1.88	
Block 3	10,001 - 13,000	\$ 1.77	\$ 2.14	
Block 4	13,001 -	\$ 1.77	\$ 2.14	
Irrigation	<u>Rate / 1,000</u>	<u>Rate / 1,000</u>	<u>Rate / 1,000</u>	
	<u>Use (GAL)</u>	<u>GAL</u>	<u>GAL</u>	
Block 1	1 - 20,000	N/A	N/A	
Block 2	20,001 -	N/A	N/A	

**SECTION 5. WASTEWATER SYSTEM RATE SCHEDULE FOR ALL
COUNTY WASTEWATER UTILITY CUSTOMERS EXCEPT FOR THOSE IN
SILVER SPRINGS REGIONAL WASTEWATER SYSTEM SERVICE AREA.**

Pursuant to the Water and Wastewater Utility Rate Ordinance, the Board hereby establishes and adopts the Wastewater System Rate Schedules set forth in Tables 5-1, 5-2 and 5-3 below for all wastewater customers except for those customers in the Silver Springs Regional Water and/or Wastewater System service areas, or any bulk customers.

Table 5-1

Countywide Wastewater Base Facility Charges (Per Service)

Effective Date	4/3/2009	1/1/2010	10/1/2010	10/1/2011	10/1/2012
Meter Size					
3/4"	\$ 19.06	\$ 21.54	\$ 24.34	\$ 25.80	\$ 27.35
1"	\$ 47.66	\$ 53.86	\$ 60.86	\$ 64.51	\$ 68.38
1.5"	\$ 95.34	\$ 107.73	\$ 121.73	\$ 129.03	\$ 136.77
2"	\$ 152.53	\$ 172.36	\$ 194.77	\$ 206.46	\$ 218.85
3"	\$ 305.07	\$ 344.72	\$ 389.53	\$ 412.90	\$ 437.67
4"	\$ 476.67	\$ 538.63	\$ 608.65	\$ 645.17	\$ 683.88
6"	\$ 953.34	\$ 1,077.27	\$ 1,217.32	\$ 1,290.36	\$ 1,367.78
8"	\$ 1,525.33	\$ 1,723.62	\$ 1,947.69	\$ 2,064.55	\$ 2,188.42

The Gallonage Charge for such Wastewater System Rates shall be calculated based on the applicable Usage Block set forth in the Table 5-2 below:

Table 5-2

Countywide Wastewater Gallonage Rates (Per Service)

Effective Date				4/3/2009	1/1/2010	10/1/2010	10/1/2011	10/1/2012
Residential				Rate / 1,000	Rate / 1,000	Rate / 1,000	Rate / 1,000	Rate / 1,000
Use (GAL)				GAL	GAL	GAL	GAL	GAL
Block 1	1	-	6,000	\$ 4.86	\$ 5.49	\$ 6.20	\$ 6.57	\$ 6.96
Block 2	6,001	-	12,000	\$ -	\$ -	\$ -	\$ -	\$ -
Block 3	12,001	-	20,000	\$ -	\$ -	\$ -	\$ -	\$ -
Block 4	20,001	-		\$ -	\$ -	\$ -	\$ -	\$ -
Non-Residential				Rate / 1,000	Rate / 1,000	Rate / 1,000	Rate / 1,000	Rate / 1,000
Use (GAL)				GAL	GAL	GAL	GAL	GAL
Block 1	All Use			\$ 4.86	\$ 5.49	\$ 6.20	\$ 6.57	\$ 6.96

Wastewater System Rates for all customers receiving wastewater service only, except for those customers in the Silver Springs Regional Water and/or Wastewater System service areas are as set forth in Table 5-3 below:

Table 5-3

Countywide Wastewater-Only Service Rates (Per Service)

Meter Sizes:	N/A				
Effective Date	4/3/2009	1/1/2010	10/1/2010	10/1/2011	10/1/2012
Monthly Charge	\$ 48.19	\$ 54.46	\$ 61.54	\$ 65.23	\$ 69.14

SECTION 6. WASTEWATER SYSTEM RATE SCHEDULE FOR ALL COUNTY WASTEWATER UTILITY CUSTOMERS IN SILVER SPRINGS REGIONAL WASTEWATER SYSTEM SERVICE AREAS.

Pursuant to the Water and Wastewater Utility Rate Ordinance, the Board hereby establishes and adopts the Wastewater System Rate Schedule set forth

in Tables 6-1, 6-2 and 6-3 below for all wastewater customers in the Silver Springs Regional Wastewater System service areas.

Table 6-1
Silver Springs Regional Wastewater Base Facility Charges (Per Service)

Effective Date	4/3/2009	1/1/2010	10/1/2010	10/1/2011
Meter Size				Equals Countywide Rate Structure
3/4"	\$ 15.88	\$ 19.21	\$ 23.24	
1"	\$ 42.14	\$ 50.99	\$ 61.70	
1.5"	\$ 83.50	\$ 101.04	\$ 122.26	
2"	\$ 149.37	\$ 180.74	\$ 218.70	
3"	\$ 260.43	\$ 315.12	\$ 381.30	
4"	\$ 473.97	\$ 573.50	\$ 693.94	
6"	\$ 778.84	\$ 942.40	\$ 1,140.30	
8"	\$ 1,270.02	\$ 1,536.72	\$ 1,859.43	

The Gallonage Charge for such Wastewater System Rates shall be calculated based on the applicable Usage Block set forth in the Table 6-2 below:

Table 6-2
Silver Springs Regional Wastewater Gallonage Rates (Per Service)

Service Type: SEWER					
Service Areas: SILVER SPRINGS REGIONAL					
Meter Sizes: ALL					
Effective Date		4/3/2009	1/1/2010	10/1/2010	10/1/2011
Residential		<u>Rate / 1,000</u>	<u>Rate / 1,000</u>	<u>Rate / 1,000</u>	Equals County Rate Structure: (Blocks & Rates)
	<u>Use (GAL)</u>	<u>GAL</u>	<u>GAL</u>	<u>GAL</u>	
Block 1	All Use	\$ 3.50	\$ 4.23	\$ 5.12	
Non-Residential		<u>Rate / 1,000</u>	<u>Rate / 1,000</u>	<u>Rate / 1,000</u>	
	<u>Use (GAL)</u>	<u>GAL</u>	<u>GAL</u>	<u>GAL</u>	
Block 1	All Use	\$ 3.50	\$ 4.23	\$ 5.12	

Wastewater System Rates for all customers receiving wastewater service only in the Silver Springs Regional Water and/or Wastewater System service areas are as set forth in Table 6-3 below:

Table 6-3

Silver Springs Regional Wastewater-Only Service Rates (Per Service)				
Meter Sizes:	N/A			
Effective Date	4/3/2009	1/1/2010	10/1/2010	10/1/2011
Monthly Charge	\$ 36.86	\$ 44.60	\$ 53.97	County Rate

SECTION 7. REUSE WATER SYSTEM RATE SCHEDULE FOR ALL COUNTY WASTEWATER UTILITY CUSTOMERS. Pursuant to the Water and Wastewater Utility Rate Ordinance, the Board hereby establishes and adopts the Reuse Water Rate set forth in Table 7-1 below for all reuse customers.

Table 7-1
Countywide Reuse Rates

Type of Service	Charge per 1,000 Gallons
Low-Pressure Bulk Rate	
With onsite storage	\$ 0.15
Without onsite storage	\$ 0.30
Retail	\$ 0.60
Base Charge per Account	\$ 4.00
Gallage Charge	\$ 0.60

SECTION 8. BULK WATER AND WASTEWATER RATES. Bulk wholesale or temporary water and wastewater rates shall be calculated to reflect

the County's cost of producing and transmitting water and/or accepting, treating and disposing of wastewater to and from those entities entering into an agreement with the County. Such rates will be determined on an individual basis by the County. Notwithstanding anything to the contrary, should either the water or wastewater base facility charge or the water or wastewater volume user charge collected during the first and each subsequent year of the provision of service to any customer be less than the water base facility charge, wastewater base facility charge, water volume user charge, or wastewater volume user charge which is charged to the County, the County shall have the right to charge and collect any such difference between what it (the County) is charged for that component of wholesale or temporary service and what the County has previously charged and collected from the customer for water and/or wastewater service. This annual differential charge shall be billed within thirty (30) days following the end of the first twelve months of service to the customer, and shall likewise be billed in the same manner in each subsequent year of service.

SECTION 9. CONSTRUCTION WATER, TEMPORARY USE WATER, TANKER REFILL AND OTHER INTERIM USE FEES. The interim use of water is available throughout the County Service Area construction water, temporary use water, tanker refill and other temporary or interim uses. Such service shall be obtained from a fire hydrant equipped with a backflow prevention device and a meter set by the County. The Board hereby establishes a deposit of ONE THOUSAND FIVE HUNDRED DOLLARS (\$1500.00) for each meter location. The Board hereby establishes an installation fee of ONE HUNDRED FIFTY DOLLARS (\$150.00) for each meter location for interim water use. Charges for

water service provided at each such meter location shall consist of a base fee of One Hundred Dollars (\$100.00) per month, plus a Gallonage Charge based on an assumed meter size of 1.0" and the Block Rate set forth in then applicable County rate resolutions for interim water service within the regional water and wastewater system service areas.

SECTION 10. WATER METER INSTALLATION CHARGES.

10.1. The Board hereby establishes and adopts the Water Meter Installation fees set forth in Table 10-1 below.

TABLE 10-1

Water Meter Installation Fees

5/8" x 3/4" Meter	\$ 360.00
1.0" Meter	\$ 470.00
1.5" Positive Displacement Meter	\$ 665.00
2.0" Turbine Meter	\$ 835.00
2.0" Compound Meter	\$ 1,555.00
Above 2.0" Meter	actual cost plus overhead

10.2. The above charges assume only the installation of the meter and does not include the costs associated with the installation of a service and tapping into the water main, which shall be charged separately.

SECTION 11. METER TESTING CHARGES.

11.1. The Board hereby establishes and adopts the meter testing fees as set forth in Table 11-1 below. If any Customer requests a test of the water meter, the County will require a deposit to defray the cost of testing. Such deposit shall not exceed the following schedule of fees.

TABLE 11-1
Water Meter Testing Fees

5/8" x 3/4" meter	\$ 60.00
1.0" and 1.5" meter	\$ 60.00
2.0" meter and over	actual cost plus overhead

11.2. The test fee is retained by the County only if the test shows that the meter is registering within the acceptable accuracy limits as established by the County. If the meter is determined by the County to be registering outside of the acceptable accuracy limits set forth in American Water Works Manual, M6, Table 5-3, the meter test service charge will be refunded and an adjustment made in accordance with the Utility Rate Ordinance, Section 19-180.

SECTION 12. RECONNECTION CHARGES.

12.1. Reconnection of Discontinued Service. In the event that service is disconnected for failure to pay the applicable fees and charges, or otherwise reconnected, all as set forth in more detail in the Water and Wastewater Utility Rate Ordinance, the reconnection charge shall be Fifty Five Dollars (\$55.00) when performed during regular working hours, One Hundred Dollars (\$100.00) when performed after regular working hours (non-holiday), and One Hundred Fifty Dollars (\$150.00) during County observed holidays. There will be no service reconnected after the hour of 10:00 PM.

12.2. Seasonal Reconnection Charges. In the event the customer wishes to temporarily disconnect service for a period of one month or more, the County will disconnect and reconnect service for a fee of Twenty Five dollars (\$25.00) upon three days advanced notice to the Utilities Department.

SECTION 13. RETURNED CHECK CHARGE. The Board hereby establishes and adopts a returned check charge for each returned check received by the County for utility service payments. The returned check charge shall be as follows:

<u>Face of Check</u>	<u>Charge</u>
Up to \$50.00	\$ 25.00
\$50.01 to \$300.00	\$ 30.00
Greater than \$300.00	\$ 40.00 or 5% of face, whichever is greater

SECTION 14. LATE PAYMENT FEES. The Board hereby establishes and adopts as a fee for Customer's delinquent in the payment of the monthly utility bills an amount equal to 5% of the unpaid balance or Five Dollars (\$5.00), whichever is greater.

SECTION 15. INITIAL DEPOSITS. The Board hereby establishes and adopts the amounts of initial deposit for utility service set forth in Table 15-1 below, set according to customer class and meter size.

TABLE 15-1

Service Deposit Amounts

Description	Charge
Residential Water	\$ 50.00
Residential Sewer	\$ 100.00
Commercial Water 3/4"	\$ 60.00
Commercial Sewer 3/4"	\$ 120.00
Commercial Water 1.0"	\$ 105.00
Commercial Sewer 1.0"	\$ 215.00
Commercial Water 1.5"	\$ 210.00
Commercial Sewer 1.5"	\$ 435.00
Commercial Water 2.0"	\$ 340.00
Commercial Sewer 2.0"	\$ 680.00
Over 2.0" (two months estimated)	

15.1. Deposits for meter sizes exceeding 2 inches shall be determined on a case-by-case basis by the County.

15.2. The Board hereby adopts a Five Dollar (\$5.00) nonrefundable fee for performing credit checks on customers or potential customers.

SECTION 16. ANNUAL FIRE LINE CHARGES. The Board hereby establishes and adopts the annual fire line charges set forth in Table 16-1 below. This charge may be billed as a monthly fee not to exceed the total annual charge at the discretion of the County.

TABLE 16-1

Annual Fire Line Charges

Description	Charge
4.0" line/main	\$ 800.00
6.0" line/main	\$ 1,600.00
8.0" line/main	\$ 2,700.00
10.0" line/main	\$ 4,200.00
12.0" line/main	\$ 6,800.00

SECTION 17. AVAILABILITY LETTER FEE. The Board hereby adopts a nonrefundable Twenty Five Dollar (\$25.00) fee per service type (water, wastewater or reuse) for the issuance of capacity availability letters by the County to any person, firm or entity. In addition, if inspection or field verification will be required by the County in order to issue the letter, costs for field verification shall be charged at the rate for inspection set forth within this Resolution.

SECTION 18. UTILITY FACILITY PERMIT FEE. The Board hereby establishes and adopts the following fee to obtain a utility facility permit: minimum fee of Five Hundred Dollars (\$500.00) plus reasonable costs incurred.

SECTION 19. MISCELLANEOUS CHARGES.

19.1. Service Connection Charge. The Board hereby establishes and adopts the charges set forth in Table 19-1 for requests by new utility customers for utility service from the County.

TABLE 19-1

New Service Charges

Description	Charge
Initial Connection Fee	\$ 55.00
Same Day Service Connection	\$ 85.00
New Service After Hours	\$ 100.00
Credit Check	\$ 5.00

19.2. Fee to Transfer Utility Service Account. The Board hereby establishes and adopts a fee of Fifty Five Dollars (\$55.00) for requests by existing utility customers to transfer utility service accounts into the name of a third party. The recipient of any such transfer shall be subject to any and all applicable provisions of Water and Wastewater Utility Rate Ordinance and Resolutions regarding service deposits, qualifications and conditions applicable a utility service account holder.

19.3. After Hours Service Calls. The County shall charge a fee of One Hundred Twenty Dollars (\$120.00) for requests by utility customers for County personnel to be dispatched after normal County business hours.

19.4. Inspection Fees. The Board hereby establishes and adopts the fees set forth in Table 19-4 below for both field and office time required of each County staff person for inspection pursuant to Section 5(9) of the Water and Wastewater Utility Rate Ordinance.

TABLE 19-4
Inspection Fees

Description	Charge
Service Inspection Fee (during business hrs.)	\$ 85.00
After Hours Service Inspection Fee	\$ 120.00

19.5. Re-inspection Fee. The Board hereby establishes and adopts the fees set forth in Table 19-5 below for Re-inspections pursuant to Section 25(2) of the Water and Wastewater Utility Rate Ordinance.

TABLE 19-5
Re-Inspection Fees

Description	Charge
Water Main, force Main or Reclaimed main pressure test	\$ 90.00
Low pressure air test	\$ 45.00
Lift station start up	\$120.00
Water quality testing	\$ 45.00
Final walkthrough	\$180.00

19.6. Meter Tampering or Theft of Service Fees. The Board hereby establishes and adopts the fees set forth in Table 19-6 below to inspect

service meters or fixtures that have been accessed by a person other than an authorized representative of Marion County or to reinstall meters that have been removed as a result of such unauthorized access or both. No person shall damage, knowingly tamper or meddle with any part of the meter service or water and/or wastewater pipe or fittings connected with or belonging to the County's Water and Wastewater System. No person shall in any way hinder or interfere with the proper operation of the system in such a manner to cause loss or damage.

TABLE 19-6

Meter Tampering, Theft of Service and Reinstallation Fees

Description	Charge
Tampering	\$ 250.00
Reinstalling of Meter (after pulled for tampering)	\$ 125.00

19.7. Service Tap Fees. The Board hereby establishes and adopts the fees set forth in Table 19-7 below for utility service line extension tap into the County's utility system.

.TABLE 19-7

Service Tap Fees

Description	Charge
Short Tap	\$ 480.00
Long Tap	\$ 610.00
Water Service Line	\$ 480.00
Sewer Lateral	\$ 1,160.00
Service Line Extension – Double Taps	2 times the single tap rate

19.8. Location Fee for Lateral Service Lines. The Board hereby establishes and adopts the fees set forth in Table 19-8 below for each request to

have the County identify the location of the County's lateral service lines, either in conjunction with the installation of a meter or any other purpose.

TABLE 19-8

Lateral Service Line Location Fee

Description	Charge
In conjunction with meter installation	\$ 35.00
Not in conjunction with meter installation	\$ 95.00

19.9. Relocation of Meter Service. The Board hereby establishes and adopts a fee of Two Hundred Dollars (\$200.00) for requests by existing utility customers to relocate a utility service meter where such relocation will not require a new service tap into to County's utility system. Where any such requests will require a new tap, the Service Tap Fees under Section 19.7 of this Resolution shall apply.

19.10. Preparation of Developer Related Agreement. The County shall assess costs related to its preparation of any developer related agreements required in order to address services to be provided by County under this Resolution. Reimbursement to the County for the preparation of any such agreements, including without limitation a standard developer's agreement, a standard interim package plant agreement, or a standard plant construction agreement shall be actual costs incurred as determined by the County for such preparation.

19.11. Account Reporting and Document Research Fees. The Board hereby establishes and adopts a fee of Thirty Dollars (\$30.00) per County

staff person per hour to prepare utility service account reports or to research and locate information and data requested and which is not kept as a function of routine accounting, billing and collection activities of the County Utility Department. In addition, the County shall charge the requestor its direct costs for any outside legal or accounting services required to comply with the request.

19.12. Plan Review Fees. The County Utility Department shall charge a minimum fee of One Hundred Thirty Dollars (\$130.00) for each review or resubmittal review of plans provided for review by the County Utility Department, which fee shall include review of up to two sheets. Thereafter for each additional plan sheet, an additional fee of Ninety Five Dollars (\$95.00) per sheet shall be charged for each review or resubmittal review conducted.

19.13. Annual Fire Hydrant Maintenance Fees. The County Utility Department shall charge an annual hydrant maintenance fee of ONE HUNDRED DOLLARS (\$100.00) per hydrant per year for commercial, multi-family, institutional, interlocal or other service conditions.

19.14. Removal of Irrigation Service. The County shall charge a fee of FORTY DOLLARS (\$40.00) for removal of an irrigation meter.

19.15. Preparation of Service Agreement. The Board hereby establishes and adopts the fees set forth in Table 19.15 below for its preparation of service agreements addressing utility services.

TABLE 19-15
Preparation of Service Agreement Fee

Description	Fee	Explanation
Legal Fee	\$100.00	Counsel review and signature
Courier Service	\$ 35.00	Shipment to and from Counsel
Recording Fee	\$ 50.00	Clerk of Court
Staff Time	\$ 90.00	3 hrs at \$30/hr. (\$/hr per Ordinance
Total	\$275.00	

19.16. Leak Check / High Bill. The Board hereby establishes and adopts a fee of Thirty Dollars (\$30.00) to respond to a customers request to check for a leak or to verify a meter reading at a service location.

SECTION 20. TERMS OF PAYMENT. Bills are due and payable when rendered and become delinquent if not paid by the due date stated on the applicable bill. Service may be discontinued for non-payment after five (5) working days' written notice. Such notice shall be noted on the following months bill for service.

SECTION 21. REIMBURSEMENT FOR EXTRA EXPENSES.
Reimbursement for those events identified in the Water and Wastewater Utility Rate Ordinance shall be actual costs as determined by the County.

SECTION 22. REPEAL OF CONFLICTING RESOLUTIONS AND PROVISIONS OF PAST RESOLUTIONS; ANNUAL ADJUSTMENT OF RATES.
Resolutions 96-R-280, 96-R-312, 98-R-111, 99-R-216, 01-R-26, 03-R-209, 04-R-43, 07-R-187A, and 07-R-436 are hereby repealed and are superceded by this Resolution; provided, however, that all rates, fees, and charges contained in

Resolutions 07-R-187A and 07-R-436 shall remain in effect until the effective date of this Resolution. Any conflicting provisions in past resolutions are hereby repealed. All rates and charges established under this Resolution shall be subject to the annual escalation adjustment to the extent provided under Section 15 of Ordinance 96-37.

SECTION 23. SEVERABILITY. It is hereby declared to be the intent of the Board that if any Section, subsection, clause, phrase or provision of this Resolution is held invalid or unconstitutional, such invalidity or unconstitutionality shall not be construed to render invalid or unconstitutional the remaining provisions of this Resolution.

SECTION 24. EFFECTIVE DATE. This Resolution shall take effect on April 3, 2009.

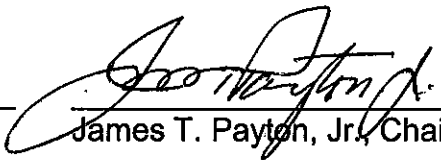
DULY ADOPTED this 11th day of March, 2009.

ATTEST:

BOARD OF COUNTY
COMMISSIONERS
MARION COUNTY, FLORIDA



David R. Ellspermann, Clerk



James T. Payton, Jr., Chairman

FOR THE USE AND RELIANCE
OF MARION COUNTY ONLY.
APPROVED AS TO FORM AND
LEGALITY

March 9, 2009



Thomas A. Cloud, Esquire
Special Utility Counsel



Marion County Office of the County Engineer
Water Resources

Water Use Efficiency Plan 2011-2012

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II. Overview

Program: Marion County Water Use Efficiency Program, Water Resources

Mission: The Marion County Water Use Efficiency Program aims to inform, educate and increase water use efficiency among residents of this county. The Water Resource Coordinator (Office of the County Engineer) will facilitate the program.

Background: A “Water Conservation Plan” (WCP) is required as a condition of the Marion County Board of County Commissioners’ Water Use Permits (WUP) issued to its Utility by the Southwest and St. Johns River Water Management Districts. This plan allows for implementation of the WCPs submitted. The MCBCC also acknowledges that all citizens are equally accountable for using water efficiently and have directed staff to implement a comprehensive, goal-based water use efficiency program, county-wide. While the program is facilitated by the Office of the County Engineer (Water Resource Coordinator), some initiatives are specific to Marion County Utility Customers. It is commonly understood that conservation is the most cost effective method to prolong groundwater supplies and delay the need for alternative water sources such as surface water or desalination.

2011-2012 Water Use Efficiency Initiatives:

Current and Ongoing

- 1) Water Conservation Kits (indoor and outdoor fixture retrofits)
- 2) Toilet Rebate Program
- 3) Landscape Irrigation Evaluation (Western Marion County)
- 4) Participation in Community Events
- 5) Workshops (micro-irrigation)

New and Proposed

- 6) Irrigation and Landscape Retrofits
- 7) Landscape Irrigation Evaluation (Eastern Marion County)
- 8) Targeted Messaging to Marion County Utility Customers

Audiences: Marion County Utility customers; Marion County residents; other county departments and staff; Private and City Utilities

Total Budget for 2011-2012-: \$ 185,200 (\$ 120,200 Utilities; \$ 65,000 Water Resources; \$ 39,000 to be reimbursed by WRWSA)

III. Goal Summary

2011-2012 Program Goals:

1. Increase public awareness of efficient irrigation practices
2. Provide incentive based programs for calculable water use reductions
3. Increase public awareness of Marion County programs
4. Provide targeted messaging to Marion County Utility Customers

2010-2011 Program Accomplishments:

1. Facilitated 3 water conservation workshops in targeted high use developments, distributed 150 micro-irrigation retrofit kits to homeowners
2. Created public awareness of irrigation ordinance
 - a. Participated in 4 community events
 - b. Mailed informational letters to residents if it was brought to our attention that they were not following the ordinance (37 letters)
 - c. Developed and implemented a county-wide, multi-media campaign
3. Provided educational print media in Utility lobby and County libraries to foster awareness of water conservation
4. Completed Landscape Irrigation Evaluation and Education Program with Masuen Consulting LLC. (124 homes)
5. Offered irrigation auditor training to qualified professionals through WRWSA

IV. 2011-2012 Program Goals

1. Increase public awareness of efficient irrigation practices

Typically, outdoor use including irrigation makes up more than 50% of total household water use. In Marion County, this equates to about 20 million gallons per day. Improving homeowner knowledge of landscape water needs and increasing the efficiency of automatic irrigation systems can significantly reduce outdoor water use.

Objective #1: Facilitate homeowner education of efficient irrigation practices

- Actions:**
- Make information about efficient irrigation practices available on “water efficiency” page of the utilities website and at MCU and Library kiosks
 - Recruit high water users for Regional Irrigation Audit Program (goal= 125 participants)
 - Facilitate workshops in high-use communities and distribute micro-irrigation kits
 - Recruit HOA or individual homeowners for system retrofits for demonstration purposes
 - Distribute print media on irrigation practices and landscape irrigation ordinance at workshops and public events
- Measurability:**
- Provide and compile follow-up surveys for homeowner workshops
 - Track number of events and handouts given at each event/venue
- Timeline:**
- Ongoing (distribute media at public events and workshops)
 - September-November 2011 (recruit homeowners/HOAs for irrigation audits and retrofits)
 - FY 2011-2012 (assess measurables and surveys)

Objective #2: Facilitate training opportunities for landscape professionals

- Actions:**
- Develop and maintain a contact list of irrigation and landscape professionals
 - Increase communication to generate interest in training programs currently being offered and determine training needs not currently offered in order to foster a water ethic among professionals
- Measurability:**
- Track attendance at local training programs
 - Survey professionals to gauge interest
- Timeline:**
- October 2011-July 2012- Compile list and administer surveys
 - August 2012- Evaluate surveys and develop recommendations for training opportunities to be implemented in 2012-13

Objective 3: Facilitate compliance with the Landscape Irrigation Ordinance

- Actions:**
- Track irrigation violations

- Upon receipt of violation complaint, facilitate education through an initial letter explaining the ordinance.
 - Review waiver requests.
- Measurability:**
- Track the number of ordinance violations and citations throughout the year to assess any reduction or change in violations after media distribution
 - Track waiver requests
- Timeline:**
- Ongoing

2. Provide incentive based programs for calculable water use reductions

Objective #1: Facilitate rebate and retrofit programs

- Actions:**
- Continue to make Water Conservation Kits available to MCU customers at Utility office
 - Promote irrigation audit program to customers with water usage > 30,000 gallons/month
 - Develop and coordinate irrigation retrofits and demonstration sites
 - Promote toilet rebate program to MCU customers with homes built prior to 1995
 - Maintain ongoing communication with contractors administering these programs
- Measurability:**
- Track number of kits, toilet rebates and irrigation audits administered
- Timeline:**
- August 2011- October 2011 (research and develop primary customer list)
 - Ongoing (support contractors with necessary data and contacts)

3. Increase public awareness of programs

Objective #1: Facilitate community recognition of Marion County Water Efficiency Program

- Actions:**
- Create marketing materials with Marion County branding
 - Revise "water conservation" link on Marion County website to establish a contact and resource for water conservation
 - Include link to the website on all new media
 - Promote relevant Marion County departments as resources for water use efficiency education to community groups (HOA, civic and community groups, etc.)
- Measurability:**
- Public survey (create an online survey to determine water use behavior changes attributable to County programs)
 - Track communications with HOAs and survey to determine which tools are of greatest benefit to them
- Timeline:**
- August- December 2011 (research and develop primary media materials)

- August- December 2011 (revise website)
- Ongoing (establish contacts with community groups)
- Develop or facilitate delivery of useful tools for HOAs

4. Provide targeted messaging to Marion County Utility Customers

Objective #1: Inform Marion County Utility Customers

- Actions:**
- Bi-monthly bill inserts (focus on landscape irrigation, indoor water use, efficiency programs/offers, contact information, etc.)
 - Quarterly postcards to high water users (>30,000 gallons/month)
- Measurability:**
- Maintain list of high water users, evaluate quarterly
- Timeline:**
- Ongoing

Marion County FY 11/12 Water Efficiency Program

Project	Total Program Amount	Program Funding 2011-2012		
		Marion County Utilities	Water Resources	Grant (Source)
Conservation Kits	\$ 10,000	\$ 5,000		\$ 5,000 (WRWSA)
Direct Mail to high-water-users and irrigation restriction violators	\$ 1,200	\$ 600		\$ 600 (WRWSA)
Irrigation and Landscape Retrofit Program	\$ 40,000		\$ 20,000	\$ 20,000 (WRWSA)
Bi-monthly Utility Bill Inserts	\$ 6,000	\$ 5,100		\$ 900 (WRWSA)
Conservation Workshops/Outreach	\$ 3,000	\$ 3,000		
Regional Irrigation Audit Program-Eastern Marion County	\$ 25,000		\$ 12,500	\$ 12,500 (WRWSA)
Toilet Rebate Program	\$ 100,000	\$ 100,000		
Total Before Grants	\$ 185,200	\$ 113,700	\$ 32,500	\$ 39,000 (WRWSA)
FY 10/11 Funded Projects Continuing in FY 11/12				
Regional Irrigation Audit Program-Western Marion County	\$ 12,500 Paid to WRWSA	\$ 12,500		
Toilet Rebate Program	\$ 100,000	\$ 100,000		\$ 50,000 (SWFWMD) + \$ 50,000 (SJRWMD)= \$ 100,000