SPECIAL PUBLICATION SJ2011-SP1

REVENUE AND COST RECOVERY ALTERNATIVES FOR UTILITIES IMPLEMENTING WATER CONSERVATION

St. Johns River Water Management District

Kirby B. Green III, Director • David W. Fisk, Assistant Executive Director

Revenue and Cost Recovery Alternatives for Utilities Implementing Water Conservation

Simmons Environmental Consulting, LLC

SJRWMD Project No. 26612

September 2010

TABLE OF CONTENTS

AKNOWLEDGEMENTS

Simmons Environmental Consulting would like to thank the following people for their valuable contribution to this study:

Jennifer McElroy (Gainesville Regional Utilities)

Diane Wilson (Gainesville Regional Utilities)

Ray Sharp (City of Leesburg)

Jason Yarborough (Palm Bay Utilities)

Lori Embrey (Palm Bay Utilities)

Lori Bockelman (Palm Bay Utilities)

Dan Roberts (Palm Bay Utilities)

Bertha Goldenberg (Miami-Dade Water and Sewer Department)

Maribel Balbin (Miami-Dade Water and Sewer Department)

Grace Johns, PhD (Hazen and Sawyer)

Bruce Adams (Eaton's EMC Engineers)

Marty Davis (Johnson Controls)

Jeff Gross (Johnson Controls)

Judy Benson (Florida Irrigation Society)

Brett Cyphers (Florida House of Representatives)

Ben Slick (Hydropoint)

Dan Lanning (R.W. Beck)

Laura Baumberger (Carollo Engineers)

Cover photo compliments of SJRWMD

EXECUTIVE SUMMARY

The St. Johns River Water Management District (SJRWMD, or the District) is currently developing a comprehensive water conservation program that includes rule changes, conservation modeling, utility outreach, and cooperative funding. While ulities within the District understand the benefits of conservation, they are concerned that conservation will negatively impact their revenue. In an effort to address these concerns, the District has contracted with Simmons Environmental Consulting (SEC) for a review of revenue and conservation program cost recovery strategies available to utilities. The objectives of this study were to:

- Identify traditional and alternative strategies for utilities to recover revenue that is lost to conservation implementation.
- Identify conservation program cost recovery strategies and strategies that partially or fully off-set program costs.
- Identify finance mechanisms that Florida utilities can use to finance conservation program costs.

These objectives were met through a literature review and interviews with water management professionals. Because the energy industry has been particularly successful at implementing conservation for the last few decades, the project included a literature review of recovery strategies used by the energy industry and interviews with energy savings companies.

Revenue Recovery strategies are presented in Section 2 and include marginal cost pricing, rate stabilization funds, drought rates, conservation surcharges, indexed rates, and decoupling. The literature review and utility survey did not identify revenue recovery strategies that would be considered an alternative to rate design. Water audit and loss control programs are also included in Section 2, although they do not recover revenue lost to demand side management (DSM). Rather, a water audit and loss control program is a utility supply-side conservation measure. This measure is included in the report because a water audit can identify opportunities to recover revenue and reduce operational costs.

Section 3 includes strategies to recover conservation program costs such as marginal cost pricing, rate stabilization funds, cost recovery factors, and fees collected for inspections and fines collected from code violations. An example of a utility that charges customers a fixed fee for smart irrigation technology is presented as a cost recovery strategy. Section 3 also includes options to off-set program costs by participating in Federal and District cost-share programs. Alternatives to amortize efficiency improvement projects is presented as well. These alternatives include using investment grade audits and performance contracting. An option for utility customers to finance efficiency improvements through land-secured municipal financing is also discussed.

Section 4 includes conclusions and recommendations. The revenue/cost recovery and financing strategies provided in this report are meant as a menu of alternatives to be considered by utilities and local governments. The feasibility of implementing these strategies singularly or in combination is best studied at thethe local-government and utility level.

1.0 PROJECT INTRODUCTION AND OBJECTIVES

The St. Johns River Water Management District is currently developing a comprehensive water conservation program that includes rule changes, conservation modeling, and utility outreach. This effort also includes a significant cooperative funding program, which in its inaugural year (Fiscal Year 2009-2010), awarded $3,592,970 in matching funds for water conservation projects. Utilities within the District's jurisdiction acknowledge the long-term benefits of conservation which include:

- The deferment of capital projects
- Reduction in size of new capital projects
- Ability to stretch less expensive groundwater supplies further
- Ability to demonstrate efficient use of the resource when modifying Consumptive Use Permits (CUPs)

Although these benefits are understood, utilities are concerned with short-term financial impacts that may result from conservation programs that new District rules may require them to implement. They are also concerned with the impact of District-led conservation efforts that their customers may participate in. These financial concerns are detailed below:

- Conservation program costs are typically not amortized; therefore, the impact to cost-of-service rates to cover program costs are greater than if financing were available.
- Reduction in water usage results in a decline in revenue.
- Decline in revenue typically results in a cost-of-service rate increase to cover debt and operating expenses.
- Where utility sewer cost-of-service rates are tied to water consumption, the sewer revenues also decrease; therefore, the sewer cost-of-service rates must also be increased.
- Where the utility has implemented a water conservation rate structure, the impact is to the costliest tier, possibly exacerbating the revenue impact.
- For local government utilities, cost-of-service rate increases must be supported by elected officials, who are hesitant to increase rates, especially in the current economy.
- Utilities must manage customer perceptions that the more efficient they become, the higher their water rates will climb. However with more utilities moving toward more precise metering alternatives, utilities must also communicate the possibilities of off-setting increased revenues due to precision, with decreases due to conservation.

SJRWMD understands these utility challenges, and in an effort to address them, the District has contracted with SEC for a review of conservation revenue and program cost recovery strategies available to utilities. The objectives of this study were to:

- Identify traditional and alternative strategies for utilities to recover revenue that is lost to conservation implementation.

- Identify conservation program cost recovery strategies and strategies that partially or fully off-set program costs.
- Identify finance mechanisms that Florida utilities can use to finance conservation program costs.

These objectives were met through a literature review and interviews with water management professionals. Utilities that are currently participating in the District's Conservation Pilot Project, in which SEC is also involved, received a written survey requesting information pertaining to their current rate structures and how they have mitigated or plan to mitigate financial effects of conservation. The utilities that returned surveys include:

- City of Leesburg
- City of Palm Bay
- Gainesville Regional Utilities (GRU)

The responses that were received are incorporated into the revenue and cost recovery sections of this report. They provide notes of interest and supporting examples of utilities implementing the various options. Written survey responses provided by the utilities are also attached. In addition to surveying the pilot utilities, Miami-Dade Water and Sewer Department was contacted because the utility recently experienced a significant reduction in water use. These reductions occurred as a result of watering restrictions and the implementation of a capital-intensive water conservation program for the last three years.

The energy industry has been particularly successful at implementing DSM since the 1980s, and has developed mechanisms to recover costs and revenues associated with DSM programs. The literature review included recovery strategies used by the energy industry and the interviews included energy savings companies.

This report is intended to encourage utilities to integrate conservation and financial planning by providing strategies to consider in the integrated planning process. The customers and resources of each utility are uniquely different; therefore, an in-depth study of the financial alternatives included in this report is best performed at the utility level.

2.0 Revenue Recovery Strategies

Utility systems operate financially through cost-of-service charges for water and sewer service. Utility cost savings from reduced water usage may result from conservation, but the reduction is not a 1:1 relationship. Most costs associated with operating a utility are fixed, such as debt service and payroll. There are also variable operating costs such as electricity and chemicals. Reduced water consumption affects energy and chemical costs; but, these two items tend to be largely fixed over a broad range of demand. Fixed and variable costs are typically recovered through usage cost-of-service rates; therefore, the utility can significantly under recover the revenue needed to pay for these costs if, they did not carefully integrate the anticipated use reductions in their financial planning and rate setting.

Under recovery of revenue can occur as a result of many water-use factors including:

- Customers participating in utility DSM programs
- Customers responding to rainy conditions by inhibiting irrigation manually, or through use of rain sensors or soil moisture sensors
- Customers complying with watering restrictions imposed by the District
- Declines in the housing market
- Economic conditions that drive homeowners to reduce their household expenses and non-residential customers to reduce their operating expenses
- Discretionary tiers may drive significant irrigation users to private irrigation wells

To the extent possible, it is important for utility financial analyses to consider reductions that occur as a result of all these factors. However, these factors (and other factors not listed above) and their effect on water use vary in their level of predictability. A factor with relatively low predictability is the transfer of current and/or forecasted irrigation demand from the potable system to private irrigation wells. Comparatively, water use reductions that result from utility-planned DSM programs and typical weather patterns are easier to predict.

When a water utility implements a DSM program but does not integrate the anticipated reduced water sales into their cost-of-service rate making process *ahead* of program roll-out, reduced revenue is certain to occur. When it does, the utility is faced with raising cost-of-service rates the following year to recover the revenue. This strategy of raising cost-of-service rates after customers have conserved is certainly capable of recovering revenue lost to conservation. However, it can be unpopular with customers because it is almost certain to send the message to customers that the more they conserve, the higher their rates will climb. Utilities that do not include a mechanism for immediate response to drought or rainy conditions, may also experience unstable revenues. This can also occur as some Florida Water Districts impose and rescind watering restrictions based on drought conditions or triggers. The utility's rate resolution should also include provisions for the utility to quickly respond to these less-predictable water use fluctuations. Once the rate structure/resolution has been approved, the utility can initiate its DSM program and support (through ordinance development and code enforcement) District watering restrictions with confidence that their rate structure will support the reduced water use without a negative financial impact on the utility. This approach is more palatable to customers because conservation programs can be marketed as a means to help the customer minimize the impact the increased rates could have on their water (and in many cases wastewater) bill.

Although a conservation rate structure is considered a conservation measure and is an effective means of reducing use, for the purposes of this report only, the use of the terms "conservation" and "DSM" do not include the structure. For this report, these two terms are reserved to refer to conservation best management practices (BMPs) such as indoor hardware retrofits, landscape irrigation efficiency modifications, watering restrictions, and other conservation options that are implemented on the service side of the utility meter. This distinction is made to differentiate between the effect of a conservation rate structure on customer use/utility revenue, and the effect of DSM on utility revenue.

This study is concerned with the latter: how DSM affects utility costs and revenue, and how program costs and revenue losses can be recovered, offset, and/or avoided.

In the SJRWMD, many utilities have implemented a conservation rate structure but have not yet implemented utility-sponsored DSM programs with significant costs (and resulting savings); rather, they are currently in the planning phases of DSM programs. Many of these utilities currently have conservation rate structures carefully designed to include the effect of price elasticity within the structure. The focus of this study is the next step to be taken by the utility, preparing for the impact of additional conservation measures. This section includes an overview of strategies that are capable of maintaining the financial health of the utility as customers respond to DSM BMPs, District-wide watering restrictions and other District-led conservation initiatives. As previously mentioned, utilities with a conservation rate structure will likely experience greater revenue losses (as compared to utilities with a flat rates for example) if they do not integrate the impacts of additional conservation measures into their existing conservation rate structures. This is because reduced water use begins at the highest tier for each customer. Utilities that are in the planning phases of DSM programs are in an ideal position to integrate estimated water use reductions with rate making. These utilities are well positioned because they have a relatively firm understanding of their customers' response to price signals in their rate structure. Also, the utility has an understanding of how their customers may respond to District-led drought-based water use restrictions. Armed with this understanding, they are poised to introduce additional conservation measures.

GRU, and the cities of Leesburg and Palm Bay are examples of SJRWMD utilities that have a good handle on their rate structure and are well positioned to integrate the effects of future DSM programs into their structure. Through the years, their rate designs have consistently been constructed to account for price elasticity and in the case of Palm Bay and Leesburg, allow for annual adjustments. The cities of Leesburg and Palm Bay noted that their rate structures have each resulted in adequate revenues for their utility. After experiencing under recovery of revenue in fiscal 2010, GRU carefully integrated conservation and other negative revenue effects into their fiscal 2011 rate study and design.

While the focus of this report is to present strategies that address revenue recovery as it relates to utility-implemented DSM programs and possible District watering restrictions. However, some of the strategies can also protect utility revenue against less predictable factors that affect water use. The following subsections include revenue recovery strategies that account for DSM costs and reduced water use, and are capable of providing adequate revenue. Examples of utilities using these strategies are included along with a description of the strategy. All of these strategies are rate-making practices. The literature review and utility survey did not identify any revenue recovery strategies that would be considered an alternative to rate design. Water audit and loss control programs are also included in this Subsection although they do not recover revenue lost to DSM. Rather, a water audit and leak control program is a utility supply-side conservation measure. This measure is included in the report because of the ability of a water audit to identify opportunities to recover revenue as well as reduce operation costs. Alternatives to off-set and finance program costs through rates and through other mechanisms were identified in the literature and through interviews. Those strategies are provided in Section 3.

2.1 Marginal Cost Pricing

Marginal cost rate design is an effective method of providing an incentive for customers to conserve. When marginal cost pricing is used with tiered rates, the top tier (or tiers) is (are) based on the marginal cost of water. The marginal cost represents the additional (incremental cost) incurred from producing a unit of "new" (typically more costly) water. It is the long-run unit cost that is avoided by DSM water savings. Utilities sometimes quantify avoided water and wastewater costs, but seldom include it in their rate designs. However, this approach deserves serious consideration because future (alternative) water supply costs are significantly greater. It is recommended in the literature that utilities should move away from the mentality that revenue requirements should reflect the current cost of water only (Johns, 2009). An integrated approach to marginal cost pricing includes accounting for the anticipated effects of reduced water use due to price signals and due to conservation DSM programs. When correctly designed in an integrated manner with DSM planning, this approach can ensure the financial integrity of the utility and revenue recovered from the top tier(s) can be used to fund conservation programs.

2.2 Conservation Rate Stabilization Funds

In general, rate stabilization funds provide a cushion to protect utilities from short-term water use fluctuations, including utility DSM programs and District-wide watering restrictions, among other factors. The fund is established by setting rates higher than current requirements in order to generate revenues for a reserve fund. In addition to smoothing the revenue effects of variable water use, the fund can be used to spread the costs of DSM resources over a longer period of time. In effect, the creation of a rate stabilization fund recognizes that current ratepayers are underpaying the hypothetical cost of future supplies.

The City of Leesburg is currently developing rate stabilization funds for all their utilities in order to provide protection for their customers from short-term anomalies and to minimize the impacts of long term trends on rates. In their survey response, the utility noted that to the extent that DSM produces reduced water sales not otherwise accounted for in rate studies and rate design, use of a rate stabilization fund is appropriate. GRU indicated that the utility does not have a specific rate stabilization fund dedicated to conservation programs; however, the utility does have a general rate stabilization fund that is used to alleviate upward water-rate pressure.

2.3 Drought or Water Shortage Rates

Drought rates are temporary rates in the form a surcharge added to the utility's existing rate structure, or a separate rate structure automatically implemented during a water shortage. A utility could have multiple levels of drought rates corresponding with increasing levels of drought severity. Drought surcharges can be an effective tool to reduce overall demand during drought and stabilize finances. Drought rates or surcharges also increase the cost of water during water shortage restrictions to offset decreases in revenue due to decreased water use. Typically, drought rates are designed to affect customers using more than a specified volume, often 10,000 gallons of water each month. Utilities could include in their rate resolution that drought rates would be implemented immediately upon

declaration of a water shortage by the District. Providing for a mechanism to quickly respond to drought-based reduced water use will help to assure the bond rating agencies that the utility can immediately recover revenue. This minimizes the implied risk that the utility would not meet rate covenants as delineated in the Bond Resolution.

In the Southwest Florida Water Management District (SWFWMD), the City of Englewood and Charlotte County have drought rates. Charlotte County has an ordinance that authorizes the County Commission to impose emergency water shortage rates. Typically, when emergency rates are in effect, the utility experiences a 6% reduction in water use without a negative financial impact.

2.4 Conservation Surcharges

A conservation surcharge is a surcharge built into a utility's rate structure to account for reduced water use resulting from conservation implementation. A conservation surcharge differs from a drought surcharge in that it is applied year round. Drought surcharges are applied seasonally or based on water shortage conditions or triggers. If correctly designed, a conservation surcharge can encourage water use efficiency and help a utility to remain revenue neutral when customers reduce water use. It can be used as a revenue recovery strategy to account for demand reductions anticipated from utility DSM measures and District watering restrictions. South Florida Water Management District (SFWMD) surveyed South Florida utilities in July 2007 to find out how many utilities had conservation surcharges. Results indicated 17 of 49 utilities had conservation surcharges in place (SFWMD, 2009).

An example of a utility that currently uses surcharges is Miami-Dade Water and Sewer Department (MDWASD). The utility implemented the surcharge in order to recover revenue lost to SFWMD-wide irrigation restrictions. In 2007, SFWMD imposed two- and one-day watering restrictions throughout the year in response to Phase II and III water shortages. As a result, MDWASD's daily per capita water use decreased from 158 to 143 (based on 2006 and 2007 yearly averages). The reduced water use translated into a significant revenue loss. The utility responded with a surcharge applied to the highest tier of their water rate structure. The MDWASD increased rate structure was easily marketed to Commissioners and to customers because the impact to the average customer (customers who use 6,750 gal/mo) was only around 5% to 6%. The surcharge stabilized their revenues. To remain stable, MDWSD implemented a year-round county-wide irrigation restriction of two days/week to avoid increases in demand (and over recovery of revenue) in periods when SFWMD restrictions are not in place. This approach helps the utility to remain revenue neutral while District watering restrictions fluctuate in response to water shortages. Recently, the SFWMD implemented year-round restrictions that would allow irrigation three days a week in Miami-Dade when a water shortage is not otherwise in effect (Chapter 40E-24, F.A.C.; effective March 15, 2010); however, the County intends to keep their year-round twice-per-week restrictions.

2.5 Annual Index Adjustment

A utility can include an annual index adjustment clause in its rate resolution or enact an ordinance to enable the utility to adjust the rates for water and wastewater service. The intent of the adjustment is

to account for inflationary effects on utility operational costs (including conservation program costs), and to do so without a formal rate hearing or analysis. Although peripheral to its intent, the annual rate adjustments can also help to stabilize revenue effects due to short-term water use fluctuations. This includes use reductions from conservation. The annual index adjustment can be based upon federal cost indices, the Florida Public Service Commission (PSC) Deflator Index, the local consumer price index (CPI) reported by the Bureau of Labor Statistics, or by the University of Florida Bureau of Economic and Business Research (BEBR); or it can be based upon a specified percentage such as 3%. The adjustment can be applied to monthly base and usage charges, as well as other utility fees and charges. Rate ordinances can place limitations on the extent to which the rates can be adjusted upward or downward without City Council/County Commission approval, and allow increases/decreases beyond the specified amounts with Council/Commission adoption. An added benefit of an annual adjustment clause is that it helps to assure the bond rating agencies that the utility's rates will keep pace with inflation. Hence, there is less implied risk that the utility would not meet rate covenants delineated in the Bond Resolution.

In Palm Bay's survey response, the utility indicated that their current inclining block rate structure was implemented as a result of a rate study completed in October 2004. The rates adopted as a result of the study included annual index adjustments. The utility indicated that the index has helped to offset the decline in revenues due to water conservation and other water use factors, including an approximate 3% decrease in water consumption from July 2009 to July 2010. The utility reported that rate increases have not been an issue with elected officials or customers because the rates are indexed. Similarly, six years ago, the City of Leesburg enacted an ordinance that provides for automatic annual adjustments of utility rates based upon federal cost indices. Clay County Utility's rates are also indexed, and are based upon the CPI reported by BEBR for the Jacksonville Region.

2.6 Decoupling for Privately-owned Utilities

Decoupling is a means of removing all fixed costs from the variable costs that go into setting the variable rate. The intent of decoupling is to break the link between utility revenues and sales volumes. This strategy has been used by power utilities for decades and originated as a means to remove the disincentive for power utilities to implement DSM programs. It is the most cited conservation revenue recovery strategy used by the power industry and is appropriate for investor-owned utilities. The Florida PSC recently provided a report to the Governor regarding decoupling for power utilities (Florida PSC, 2008). The presentation was a requirement of HB7135. Although the report focused on energy utilities, it identified that decoupling was also appropriate for regulated water utilities.

The California Water Conservation Council (CUWCC) developed a report for the California Governor and Legislature (CUWCC, 2005). In the report, CUWCC recommended that the California Public Utilities Commission (CPUC) should adopt a water rates decoupling mechanism to promote conservation rates by private water companies. The recommendation also included that the CPUC should allow the private water utilities to recover DSM program costs through rates. Private water utilities in California that now use the decoupling mechanism include Cal Water, Suburban, and Park.

The City of Leesburg commented on decoupling, stating that the City's rates incorporate decoupling to a degree because the very nature of cost-based rate studies identifies and categorizes fixed and variable costs. The utility's response noted that life-line rates may conflict with strict decoupling because life-line rates dictate that the minimum bill be as low as possible. Therefore, the life-line rate may include minimal to zero fixed costs. In this case, most (or all) fixed costs must be built into the variable charge of the next higher tier. However, if the majority of customers use water within this next tier, the risk of under recovering fixed costs is minimized.

GRU's survey response indicated that the utility had considered revenue recovery through decoupling. However, the utility is concerned that decoupling has negative impacts that would likely outweigh possible benefits. Specifically, fixed costs make up a greater percentage of GRU's rates than variable costs. Therefore, the utility is concerned that if fixed costs were billed independent of customer consumption, the usage charge within the three water tiers would be significantly reduced. A reduction in the cost of these tiers would increase the basic cost of water for customers who stay within the lowest tier, and the price signal for customers in the highest tier may not be strong enough to incentivize conservation.

2.7 Water Loss Control

Water loss control is a supply-side management (SSM) program, rather than a DSM program. It refers to a utility's accountability of their water operations by auditing their supplies, and by implementing controls to minimize system losses from pipeline leakage. Before understanding how water loss control can be used as a revenue recovery option, the reader must understand how water losses are identified and defined. Therefore, a brief overview of water audit and loss control methodologies is provided in Subsection 2.7.1, and 2.7.2 includes background relating to SJRWMD CUP rules. Examples of utilities implementing water loss programs are provided in Subsection 2.7.3.

2.7.1 Water Audit and Loss Control Methodologies

A water loss control program includes a water audit, as well as leak detection and repair measures. Water audit methods developed by the American Water Works Association (AWWA) have significantly evolved over the last decade. In the previous method, water audits identified "total unaccounted-for water" from the metered source to the service meter (AWWA M36, 2nd Edition). This methodology includes the performance metric "unaccounted-for percentage," which is defined as the metered source water minus metered and authorized unmetered water uses divided by the metered source water. AWWA has recently moved away from this methodology because the unaccounted-for percentage indicator was found to be mathematically misleading and revealed nothing about water volumes and costs, the two most important factors in water efficiency assessments.

AWWA, in association with the International Water Association (IWA), recently updated the water audit methodology (AWWA M36, 3nd Edition). The new methodology discontinued the use of the term "unaccounted-for water." The new methodology accounts for all water, identifying each water use as

being either revenue water or non-revenue water. All losses are "non-revenue water," and each loss is defined as being either a real loss or an apparent loss as described below:

- Apparent losses are the non-physical losses that occur in utility operations due to customer meter inaccuracies, systematic data handling errors in customer billing systems and unauthorized consumption. In other words, this is water that is consumed but is not properly measured, accounted or paid for. These losses cost utilities revenue and distort data on customer consumption patterns.
- Real losses are the physical losses of water from the distribution system, including leakage and storage overflows. These losses inflate the water utility's production costs and stress water resources since they represent water that is extracted and treated, yet the water never reaches beneficial use.

2.7.2 Water Audit and Loss Control Methodologies in SJRWMD CUP Rules

SJRWMD CUP rule amendments relating to water audit methodologies and metrics are currently being considered. However, the rules that are in effect now, reflect the unaccounted-for water methodology. The current rules require the CUP applicant to perform a water audit to identify their unaccounted-for percentage. If the percentage is 10% or greater, the CUP applicant is required to evaluate the feasibility of completing a leak detection survey. Applicants must also perform a meter survey. If the meter survey reveals that meters are less than 95% accurate, 15 years old, or are beyond their useful life (based on cumulative gallons measured), the applicant must implement a meter replacement program. While rules are being amended, utilities are encouraged to identify apparent and real losses using the IWA/AWWA methodology as a means of reducing operational costs and recovering revenue. It is possible that revenue recovered from correcting apparent losses and operational cost savings gained from correcting real losses can be used as a revenue source to fund the water loss control program. If the income gain is greater than the cost to correct apparent and real losses, the utility may use the additional funds to support DSM programs. The use of the recovered revenue to leverage financing of conservation programs is also discussed in Subsection 3.7.3.

2.7.3 Examples of Utility Water Audit and Loss Control Programs

Miami-Dade Water and Sewer Department is a shining example of the degree to which the IWA/AWWA water audit methodology can identify utility revenue to be recovered from apparent losses. MDWSD conducted an IWA/AWWA water audit using historical data from each year 2006 through 2009. The audit results indicated that apparent losses represented approximately 11% of the water supplied by the utility and that real losses represented over 5% of water supplied. These water losses present an opportunity to recover approximately $20 million per year in revenue by correcting apparent losses, and to reduce operational costs by approximately $11 million by fixing real losses (MDWASD, 2010). The utility is currently addressing these losses by implementing a 20-year water loss control plan. MDWASD reports loss control implementation progress to the SFWMD annually as a CUP condition.

It is important to note that significant water losses can exist even when a utility has ongoing programs that address meter accuracy, system tampering, and leak detection. This is evidenced in the MDWASD

example. MDWASD operated a leak detection program years prior to the recent IWA/AWWA water audit and resulting loss control program. As part of its operations, the utility inspected every section of pipe in its retail service area annually using acoustical detection equipment to locate leaks, which were subsequently repaired. The program reported a savings of $7.2 million in 2002 by repairing leaks in water mains and service lines. Water saved as a result of repaired leaks in water mains, services, and meters amounted to approximately 30 MGD from 2003 to 2004 alone (MDWASD, 2005). Prior to the recent water audit, the utility's operations also included a program to test, calibrate, repair, and replace meters and a tampering monitoring program to reduce unauthorized uses. This example underscores the ability of a leak detection program to reduce operational costs, and that lost revenue and additional operational savings can be identified with a thorough IWA/AWWA audit.

Through the use of cooperative funding, the City of Sanford will be performing a water loss audit using their recently installed automatic meter reading (AMR) system.

3.0 Cost Recovery/Avoidance and Financing Strategies

Cost recovery refers to recovering the cost (in full or in part) of implementing DSM. Cost financing refers to the utility financing conservation programs. Cost avoidance refers to the utility implementing conservation DSM programs that have a cost, but the cost is not borne by the utility or local government. The difference between cost recovery and avoidance as used in this report is that a cost recovery model requires a utility to spend money on a DSM project either as an up-front cost to be recovered later or through use of a dedicated funding source identified in the utility's cost-of-service rate structure. Whereas, cost avoidance is a model by which the utility does not use utility funds (collected before or after implementation), rather the utility pays nothing for the program. In the following subsections, examples of strategies used by utilities and local governments are provided along with a description of each mechanism.

3.1 Marginal Cost Pricing and Rate Stabilization Funds

As discussed in Subsection 2.1, marginal cost pricing can provide funding for water conservation programs. Rate stabilization funds as a revenue recovery strategy is described in Subsection 2.2. Additionally, stabilization funds can be used to fund conservation if program implementation is several years away or moderate in magnitude.

3.2 Conservation Cost-recovery Factors and Utility Service District Fees

A common cost-recovery strategy used by the power industry to recover DSM and other environmental program costs is the use of a conservation cost-recovery factor or clause. The City of Leesburg's electricity rates include an energy conservation cost-recovery factor, but the City's water/wastewater rates do not include a water conservation cost-recovery factor. However, in the water utility's survey response, the utility indicated that it is plausible for a utility to include a water conservation surcharge to water bills to create a dedicated funding source for DSM for which all customers participate. The utility indicated that proper implementation of this strategy includes structuring the revenues received

from the surcharge as restricted funds to be used solely for conservation programs, including conservation staff salaries, water-efficient fixtures/equipment, and other DSM project-related expenditures. GRU, on the other hand, noted in their survey response that implementing cost-recovery clauses for conservation would likely confuse the customer.

The City of Leesburg has also evaluated the strategy of applying utility service district fees to land in order to provide dedicated funding to pay future water supply needs including DSM. However, as noted in the utility's response, in the current economy, these fees are an unreliable funding source for Leesburg because water expansion is unnecessary, for the moment.

3.3 Use of Code Violation Fines and Inspection Fees

Utilities that enforce watering restrictions can use fines that are collected from code violators to fund the enforcement program and other conservation efforts. Hillsborough County has used this approach for many years.

Another source of fines is identified in Florida Senate Bill 494 (2009) which requires a licensed contractor who performs work on an automatic landscape irrigation system to test for the correct operation of each inhibiting or interrupting device on the irrigation system. If an inhibiting/interrupting device is not installed in the system or is not in proper operating condition, the contractor must install a new one or repair the existing one and confirm that the device is in proper operating condition before completing any other work on the system. Otherwise, the contractor must report the offense. Proper operating condition is that irrigation is interrupted during rainfall events, or inhibited when sufficient soil moisture is present. There are penalties for operators of automatic landscape irrigation systems who do not properly install and maintain the required devices or switches and there are penalties for irrigation contractors who do not report such offenses. The penalties for the operators and for the contractors is required by the bill to be a minimum of $50 for a first offense, $100 for a second offense, and $250 for third or subsequent offenses. The bill requires local governments to adopt Florida's model ordinance (Florida-Friendly Landscape Guidance Models for Ordinances, Covenants, and Restrictions, September 2009) or develop one that is more stringent. The ordinance is to include these minimal penalties. The bill requires that funds generated by penalties imposed under the ordinance be used by the local government for the administration and enforcement of the ordinance and to further other water conservation activities. This local ordinance requirement could be further strengthened by the local government by requiring utility customers who have in-ground automatic irrigation systems to participate in yearly system inspections. The purpose of the inspections is to confirm rain or moisture sensor shut-off devices are properly installed and operational. The inspections could be conducted by licensed irrigation contractors or by utility staff for a fee. If the utility provides the inspections for a fee, fees collected from the program could be used to fund the inspection services and other conservation program efforts.

With the assistance of SJRWMD conservation cooperative funds, Alachua County, the City of Groveland, and the Town of Penney Farms are ramping up their irrigation ordinance/code enforcement efforts, including fining customers. Alachua County's project includes education/outreach for irrigation

contractors and customers, and technical assistance for the correct setting of rain sensors, soil moisture sensor (SMS), and controllers. The Cities of DeLand, Deltona, Orange City and Volusia County are considering developing a similiar program through use of District cooperative funding. The pending projects provides a collaborative approach among the utilities. Customers and irrigation contractors are likely to have a better response to a collaborative approach as compared to each local government developing their programs separately. When neighboring local governments coordinate efforts, compliance is increased especially if watering restrictions, landscape codes, enforcement presence, and violation fines are the same among the jurisdictions. The message to the customer is less confusing, and implementation is equitable for irrigation contractors who work in multiple jurisdictions. These county and city agencies could also consider requiring annual inspections and charging for inspections and equipment programming assistance to further off-set the program cost to each utility.

3.4 ARRA/EECBG Funding

American Reinvestment and Recovery Act (ARRA) is used to fund Energy Efficiency Community Block Grants (EECBGs). Although the focus of the grants is energy efficiency, a local government can qualify with water conservation projects in consideration of the fact that reduced water consumption translates to reduced energy use by the customer and the water utility. The City of Tucson's Office of Conservation and Sustainable Development (OCSD) is using $250,000 in EECBG funding for water and energy audits and facility retrofits for buildings and infrastructure owned by the local government. An example of a utility using EECBG funding to implement DSM programs for infrastructure not owned by the local government was not found in the literature or through phone interviews. However, since reduced water demand results in reduced energy use by the utility, regardless of whether the demand is reduced by infrastructure owned by the local government or utility customers; the same argument for receiving funding applies.

3.5 Fixed Fee on Customer Bill for Smart Irrigation Systems

Many power utilities have load management programs for their customers whereby the utility installs and maintains the equipment for a fee. The power utility recovers the associated fixed and variable program costs through a fixed fee on the customer's electricity bill. This study included identifying a similar program structure for water utilities using smart irrigation systems through a literature review and interviews. Details for implementing smart technology in SJRWMD is provided in "Technical Memorandum for Contract 26612," a separate deliverable for this project. This report, however, is focused on identifying a smart controller program structure that results in cost recovery.

An example of a utility that installs and maintains smart controllers for a fee was identified through a telephone interview with Hydropoint, provider of the WeatherTRAK smart irrigation controller. The Western Municipal Water District (WMWD) in California contracted with Hydropoint to provide a turnkey program called "SmartYard." The program is a public/private partnership that uses the utility's water bill to provide equipment financing for the customer, and cost recovery for the utility. Customers participate in the program voluntarily. For the project, WMWD contracted with Hydropoint for a turnkey solution: Hydropoint provides marketing, scheduling, site evaluation, professional installation,

routine follow-up, data transfer to controllers, and ongoing customer service. The utility recovers half of the program costs by including a program fee on the customer's bill. The monthly fee ranges from $10 to $40 depending on the number of irrigation zones and controllers. The monthly fee also includes Hydropoint data downloads and customer service. The customer's contract with the utility includes a five-year commitment. After five years, the customer owns the controller and can choose to directly contract with Hydropoint for data and customer service, or use the controller without ET data services. Because water rates will be increasing over the five-year period, it is expected that customers will continue data services to maintain water savings. If a customer moves prior to the end of the five-year term, the next homeowner or facility owner can choose whether or not to opt into the program. The new owner's financial commitment would pick up where the previous owner's left off. It is expected that new owners of the home or facility will opt-in because part of the device would have already been paid for by the previous owner. The program targets high water users so that the customer's water bill is lower with program fees, than without. Specifically, the customer's cost savings associated with water savings is greater than the cost of the program, providing a positive net benefit to the customer. From the utility's perspective, in addition to recovering half of the program fee from the customer, the program brings an added benefit of shifting some customer revenue from usage-based to a fixed fee.

WMWD has wholesale and retail customers. The WMWD offered the program to high-use retail customers. Because the WMWD's wholesale water rates are also significantly increasing, their wholesale customers are considering implementing the SmartYard program. The wholesale customers are currently evaluating the benefits of implementing the program as a requirement or as a voluntary program.

3.6 SJRWMD Cooperative Funding

In Fiscal Year 2009-2010, the SJRWMD approved $3,592,970 in matching funds for water conservation projects. The District provides these funds to improve implementation cost-effectiveness from the utility's perspective. The funding will help utilities to establish, expand and/or improve their DSM programs. Further, as evidenced by the project descriptions below (provided by SJRWMD), these participating utilities will receive benefits beyond conservation as a result of the funded projects. Please note that some of the projects listed are pending.

Agency	Project Name	Project Description
Alachua County	Alachua County Landscape Irrigation Code Implementation	The project provides for a proactive approach to the implementation of the County's irrigation code by having dedicated staff conduct routine compliance and outreach inspections at selected locations in the County. County staff will also distribute compliance assistance information and provide technical assistance for the correct setting of irrigation controllers, soil moisture sensors, and rain sensors. All the inspection information and associated data will be maintained in a GIS database. The GIS information will be used to evaluate and prioritize future target areas for inspections.

Agency	Project Name	Project Description
City of DeLand (and Deltona, Orange City, in association with Volusia County)	West Volusia Water Suppliers Landscape Irrigation Education and Enforcement (Project Pending)	This pending project consists of both educational and enforcement activities designed to improve compliance and measurably reduce the amount of municipal potable water supply and groundwater used for outdoor irrigation. A key element is the augmentation of the existing educational efforts available to advise the public about watering restrictions and efficient irrigation practices. Activities will include field monitoring, education, data collection, and processing. Enforcement activities include advisories, warnings, and fines. Technical assistance will be provided to customers to assist them in setting timers, installing and maintaining rain and moisture sensors. This project is pending.
City of Fruitland Park	Fruitland Park Goal Based Water Conservation Using an Automated Meter Reading System	The objective of this project is to implement a fixed network automated meter reading system to further enhance the City's water conservation initiative by providing valuable detailed account level water use/consumption information over designated periods of time to develop a better understanding of customer water use. The detailed consumption data will also allow the City to evaluate customers' responses to programs more quickly and better predict when water use will increase. The City will customize educational and outreach programs and program timing for optimum customer response.
City of Fruitland Park	Fruitland Park CIS/CMMS Project	The purpose of this project is to implement and support a fixed network Automatic Meter Read system (FlexNet) in conjunction with relating system accounts to GIS parcel data, thereby developing the foundation for a comprehensive computerized maintenance management system (CMMS) for the City of Fruitland Park. The City will leverage the programming flexibility of the FlexNet system to collect valuable information on individual customer water use habits. Data can be collected over designated periods of time (monthly, weekly, daily, hourly). The information will be analyzed with parcel information such as lot and building statistics from the Lake County Property Appraiser and demographic statistics from the U.S. Census. This will enable City and District staff to develop benchmark water use for selected customer profiles in Fruitland Park, target future conservation measures, and monitor performance after implementation. The City's CMMS will also be used for high water user notifications; notifications of significant changes in water use from historical amounts, and serve as a categorical database for water conservation activities by individual account (retrofits, irrigation audits, educational programs, etc.). Additionally, since the City has adopted the District's Landscape Irrigation Rule, the FlexNet system will be used for enforcement of the District's irrigation rule by identifying customers irrigating on non-designated days or during non-designated hours.
City of Groveland	City of Groveland Water Watch	The City will assign staff for the development of an enforcement and education program to address irrigation during non-designated hours and on non-designated days as defined by the City's Water Conservation Landscape Ordinance. The program will consist of patrolling, education and outreach, citations/fines, tracking, and training.
City of Jacksonville (COJ)	Compliance with the COJ Landscape Irrigation Ordinance (Project Pending)	The proposed project includes both enforcement and education aspects related to irrigation and water conservation. The general scope includes extended inspection hours for field inspectors to conduct field investigation during peak periods of citizen complaints, creation and implementation of a custom web-based database application with GIS functionality to track and evaluate project progress, enhanced citizen education efforts through extended contact hours for in-field and formal education and informational settings. This project is currently pending.

Agency	Project Name	Project Description
City of Leesburg	Historical Water Consumption Tracking	The purpose of this project is to develop water conservation savings goals that can be implemented, measured, reported, and modified to help reduce potable water demands. Elements of this project include automating the linking and tracking of historical customer consumption data, analyzing water consumption data spatially and temporally to develop trends and thresholds that can be used by the city to identify water conservation potential and target water conservation activities towards achieving this potential, developing workflows within the City's current water accounting system so that targeted water conservation activities are incorporated into the daily work order management system, development of a reporting and tracking tool for public display to track progress and educate customers.
City of Palatka	Automated Tracking and Historical Water Consumption Data	The project intends to perform automated monthly analysis of historical water consumption through the integration of existing and new proposed software. The integration will allow the City to more effectively plan, monitor, target, and take corrective action to conserve water. Key goals include developing and implementing future conservation measures that reduce consumption; and monitoring, collecting, analyzing, and reporting future actual water savings. Key as well will be the ability to communicate parcel referenced water consumption data to GIS software from which analysis will be performed.
City of Palm Coast	Palm Coast Automated Water Auditing and Code Enforcement Tracking	The project provides for automating the linkage of billing consumption data to geometric networks and land use codes, which will increase the District's understanding of water use and help to develop benchmarks of comparison for establishing District-wide conservation goals. Automation of the auditing tool will refine the temporal resolution of the City's delivery efficiency. Tracking measures at the account level will provide a better understanding of actual water savings occurring after measures are taken at each account. Enforcing current ordinances, customer education, and account audits will also contribute to water savings.
City of Port Orange	Port Orange Water Conservation Project	The project proposes to increase water conservation by utilizing technology and proactive educational actions. The installation of 650 potable water meters along with FlexNet devices at residential homes in older sections of the community will allow for monitoring of water usage on a consistent basis. Conservational and educational goals of this project will be accomplished through actively monitoring usage and performing follow up visits with homeowners to assist with over usage issues to prevent the waste of water that may come from leaks, running toilets, or non-working meters.
City of Sanford	City of Sanford Automated Meter Reading and Delivery Efficiency Program	The purpose of this project is to develop water conservation goals that can be implemented, measured, reported and modified to continuously reduce potable water demands. A primary objective will be to automate the linking and tracking of historical customer consumption data so that historical billing records data will map to a relational geo-database within the City's assets and work order management system. Once the CIS is linked to the GIS, the effort will focus on auditing the City's system to determine where there is conservation potential on both the supply side and the demand sides of the water distribution system. Using the City's recently installed AMR system, a detailed analysis will be made of water loss within the City's distribution system to reduce losses and evaluate water conservation potential and develop water savings goals.

Agency	Project Name	Project Description
Clay County Utility Authority (CCUA)	CCUA Water Conservation Project	The purpose of this project is to integrate CCUA's GIS Mapping, Customer Billing System and Work order System to improve customer water usage monitoring and use this analysis to improve CCUA's overall water conservation efforts. CCUA will develop an average water consumption threshold with seasonal trends analysis for various categories of customers within CCUA's system. A triggers matrix will be created based on historical average consumption grouped with attributes such as meter size, service type, parcel size, land type, availability of reclaimed water, etc. With the combined use of the GIS, customer billing history and the work order system, inefficient water users can be identified based on this matrix. Work orders can then be created automatically to notify these customers, analyze their usage and devise a strategy to improve their water conservation.
Gainesville Regional Utilities	Soil Moisture Sensor Demonstration and Evaluation - Phase II	The purpose of this project is to demonstrate the reliability and performance that can be achieved with soil moisture sensors in residential landscape applications, to create performance based incentives that ensure customers properly operate and maintain smart irrigation controller systems, to create tailored feedback mechanisms to support program participant performance monitoring, and to create a program that is portable to other utilities in the District. The project involves the installation of 250 soil moisture sensors in targeted residential homes.
Gainesville Regional Utilities	Optimization and Reliability of Selected Indoor Water Conservation Retrofits	The purpose of this project is to develop a methodology using account-level billing data, GIS and customer attributes to systematically target water conservation program participants to optimize water savings, to evaluate the reliability and performance of indoor water conservation products (specifically, Niagara Stealth 0.8-gpf toilets, Niagara 1.28-gpm commercial kitchen spray rinse nozzles, and MJSI Hydroclean and Hydroright toilet retrofit kits).
Marion County Utilities	Targeted Water Conservation through AMR	The goal of this program is to use AMR technology to develop a better understanding of the key types of residential water use (i.e. irrigation, cooking, and clothes washing) as well as peak times of consumption in order to develop more effective water conservation education programs. Marion County Utilities will monitor the parcel and demographic level data to better target educational efforts for a specific region. The Spruce Creek Golf and Country Club subdivision, which consists of 3,390 homes, will be the target location for the project. This community is currently consuming water at a rate of 393 gallons per household per day. The requested funds will allow Marion County Utilities to contract with a consultant to collect and analyze the hourly usage data from AMR meters and determine the activities and times of day that result in the highest consumption in order to suggest the most effective approach for conservation intervention. This intervention will be implemented with the goal of reducing consumption among the highest users to 15kgal/mo. This project will not only allow us to study the effectiveness of tailoring education based on consumption patterns but will also help to enforce the Lawn and Landscape Irrigation Ordinance by determining which households' usage patterns reflect a violation of irrigation times. Historical billing data (6 months prior to intervention) will also be collected and compared to the post-intervention consumption to quantify any changes in water consumption.

Agency	Project Name	Project Description
Orange County Utilities	Conservation Opportunities Identification and Notification System(COINS)	The purpose of this project is to develop a process for Orange County Utilities (OCU) to link its billing records, Geographical Information System (GIS) mapping software and IBM's Maximo Computer Maintenance Management System (CMMS) to plan, monitor, track, and implement water conservation measures. This will be accomplished by linking OCU's Customer Information System (CIS) database (billing records) and GIS database to geographically monitor water usage and create triggers for automated "flagging" of accounts with high water usage. The CMMS will then be modified to create work-orders for OCU's water conservation staff to track, to take corrective action, and work with customers to meet water conservation goals. The system will also be used for tracking progress after water conservation measures are put in place.
St Johns County	St Johns County Landscape Irrigation Ordinance Enforcement	This project will provide for implementation and enforcement of the County's landscape irrigation ordinance. A new code enforcement officer will be dedicated to implementing and enforcing the ordinance throughout the County through regular patrols, education and outreach activities, enforcement activities, and reporting. Education will be provided to citizens on water conservation and irrigation resources through field visits to locations of observed irrigation violations or reports of violations.
St. Johns County Utility Department	Reliability And Performance Testing of New Landscape Irrigation Technology	The purpose of this project is to field verify the use of smart irrigation controllers with moisture sensors and remote monitoring to encourage the reduction of water use among those homeowner groups with the highest consumption. The project involves the installation of 500 remotely monitored smart controllers with moisture sensors into existing homes and monitor for a period of three years.
St. Johns County Utility Department	St Johns County Utilities Department Water Conservation Initiative	The primary objectives of this project are the following: integration of data system elements into a central repository, automating the linking and tracking of data components, analysis of water use data temporally and spatially in order to target conservation opportunities, analysis of the impacts of rates on water use, developing an understanding of water loss within the system, development of workflows within the utility's current water accounting systems into the daily work order management system, development of a reporting and tracking tool for public display of progress and education.
Town of Penney Farms	Water Conservation Program	The objectives of this project are to devise a strong water conservation program within the community in advance of anticipated development and increased population in the community. Tasks include water meter upgrades, developing guidelines and incentives for new residential and commercial construction, computerizing meter reading and recording practices, strengthening the water ordinance to clearly outline enforcement of irrigation rules, and transferring historical customer consumption data and billing records to new technology.
Volusia County	Volusia County Water Watch Enforcement	The proposed project will provide officers and the equipment for enforcement and documentation of the current watering restriction violations. Officers will also issue and process citations for water violations along with performing water audits to help with education and direction for additional water conservation efforts when requested. This project is currently pending.

Agency	Project Name	Project Description
Volusia County	Volusia County Rain Barrel Project (Project Pending)	This pending project proposes a rain barrel purchase rebate program for all residents of the County. The County will issue vouchers worth $30 each towards the purchase of a 55-gallon rain barrel limited to a maximum of two per household. An estimated total of 1,000 rain barrels are expected to be distributed this way. The County will document all purchases while reviewing and submitting actual usage reports to evaluate and report water savings. This project is currently pending.

3.7 Utility Financing and Cost Avoidance

In the following subsections, energy and water savings companies, and investment grade audits are defined. Also, ways in which utilities can leverage these mechanisms to finance DSM (as well as supply-side management) programs and/or avoid DSM program costs are identified. As discussed in the following subsections, from a financing and cost-avoidance standpoint, there is an important distinction between DSM programs that manage water demands imposed by the local government only, and programs that manage demands of customers that are not an entity of the local government (homeowners, commercial customers, and industry).

3.7.1 Investment Grade Audits

An investment grade audit (IGA) is a detailed technical and economic analysis of potential energy savings projects. The IGA establishes baseline energy use for existing energy-using equipment, identifies technically and economically feasible energy efficiency improvements for existing equipment, and provides sufficient information to judge the technical and economic feasibility of the recommended project. Although the bulk of attractive payback periods rely heavily on energy efficiency improvements such as lighting, these audits also identify water savings potential. An IGA can be used to secure financing because the money saved through reduced power, water, and wastewater bills can be shown as available income to repay the loan. IGAs are a core service offering of energy and water savings companies; however, other companies that do not offer third-party financing also provide these audits. After completing an IGA, the efficiency project owner can discern if it is in their best interest to secure their own financing or enter into a performance contract with an energy or water savings company.

3.7.2 Energy Savings Companies/Water Savings Companies

Energy savings companies (ESCOs) and water savings companies (WaSCOs) act as project developers and assume the technical and performance risk associated with the project. They offer the following services which are typically bundled into the project's cost and are repaid through the dollar savings generated:

- Perform IGAs
- Develop, design, and arrange financing for energy and water efficiency projects
- Guarantee the energy/water savings, assuming the risk through performance contracting
- Install and maintain the energy and water efficient equipment involved

- Measure, monitor, and verify the project's energy and water savings

3.7.3 Use of IGAs and ESCOs/WaSCOs to Finance SSM and DSM Programs

There are two different program models for a utility to consider with respect to conservation financing options: (1) efficiency improvements for infrastructure owned by the local government, and (2) efficiency improvements for privately owned infrastructure. These two distinct program structures are described below.

Infrastructure owned by the Local Government

When the local government owns the infrastructure to be retrofitted, the government can obtain financing for the improvements by entering into a performance contract an ESCO/WaSCO or by using the IGA for a commercial loan. If performance contracting is selected, the IGA and guaranteed (by the ESCO) savings can be used to secure financing from a commercial lender or through the bond market. Alternatively, the local government can choose to obtain a commercial loan directly by using the project's IGA without the savings being garaunteed from the ESCO. However, if the local government prefers to use the bond market for financing, the savings must be garunteed by an ESCO in order to obtain a contruction bond (Florida HB 7135, 2008). Eaton's EMC Engineers recently completed an IGA for the City of Breckenridge, Colorado. The City is now evaluating the benefits of obtaining commercial financing directly or entering into a performance contract with the ESCO who performed the audit.

IGAs for government infrastructure can include an IWA/AWWA water audit. The anticipated recovered revenue (from fixing apparent losses) can be included in the performance contract or shown as a revenue stream to cover debt service on a commercial loan obtained directly by the local government.

DSM for Infrastructure Not Owned by the Local Government

This is example of a utility DSM program that could result in significant water savings with no program cost to the utility. The typical project structure for this public/private partnership involves the utility providing water use information to an ESCO or to all interested ESCOs regarding their commercial/industrial customers. The ESCO would approach the utility customer and attempt to secure a contract. However, the performance contract would be between the ESCO and the end user, not the utility. For this program structure, the utility should require the ESCO to report baseline water use and guaranteed savings back to the utility. The utility could then plan for the demand reduction in their next rate study and claim the water savings in their water supply planning and conservation reporting.

Through telephone interviews with ESCOs, it was learned that generally, the following conditions need to apply for an ESCO project to be capable of funding itself within 10 to 20 years:

- The project heated/cooled area should be at least 100,000 sq. ft.
- The usage portion of the water rate should be at least $3.50/Kgal

If available, it is best to also use information pertaining to the potential participant's power bill to further delineate ESCO potential. This targeting platform is consistent with typical ESCO marketing techniques.

GRU indicated in their survey response that they are open to implementing this strategy and believe that their elected officials would also be open to it. The utility indicated that if implemented, the utility's large account representatives would likely facilitate the initial contact between the ESCO and the utility's customers.

Through interviews with ESCOs, it appears that it may be feasible for a local government to enter into a performance contract with an ESCO for smart controllers that are installed on the utility customer's property, if the controllers are owned by the government. Smart irrigation technology is relatively new to Florida and smart controllers cost more than controllers currently in use. As such, many utilities and property owners are a hesitant to embrace the technology. Therefore, performance contracting may be a more comfortable approach towards implementing a full-scale smart controller DSM project.

3.8 PACE Financing for Owners of Private Property

Property Assessed Clean Energy (PACE) Programs are relatively new programs that enable local governments to finance renewable energy, and energy and *water* efficiency projects on private property, including residential, commercial and industrial properties. In general, PACE is rooted in the traditional land-secured municipal financing that has been used for decades for projects such as for the installation of water and sewer lines. This type of tax-assessed financing involves a local government creating an improvement district and issuing a bond secured by real property within the district. The bond proceeds are used to fund the projects. Property owners then repay the debt service on the bond over a 20-year period through an increase on their annual property taxes equal to one-twentieth of the loan plus interest in fixed payments. The annual energy cost savings from the efficiency improvements can exceed the cost of the annual repayment costs, thereby resulting in no net out-of-pocket expense to the property owner. The program comes at no cost to taxpayers who don't participate.

PACE has been used by many local governments in California, Colorado, and New Mexico. Florida counties, Miami-Dade, Orange, Sarasota, Leon, and St. Lucie have teamed to seek $1 million each to kick-start their PACE programs. Cutler Bay Mayor, Paul Vrooman has been working to band several municipalities together to create an energy-financing corridor. His effort has resulted in contiguous support from the City of Miami to Cutler Bay. These cities intend to partner for the bonding necessary to make the loans. Other local governments in Florida are also gearing up for the program.

The Federal Housing Finance Agency (FHFA) regulates the Federal Home Loan Mortgage Corporation (FHLMC), known as Freddie Mac; the Federal National Mortgage Association (FNMA), known as Fannie Mae; and the 12 Federal Home Loan Banks. These government-sponsored enterprises provide more than $5.9 trillion in funding for the U.S. mortgage markets and financial institutions. In a recent announcement, the FHFA issued a statement that has seriously hindered the PACE program for the immediate future (FHFA, 2010). The statement declared that the PACE program presented "significant

safety and soundness concerns that must be addressed by Fannie Mae, Freddie Mac and the Federal Home Loan Banks. [The program seeks] to foster lending for retrofits of residential or commercial properties through a county or city's tax assessment regime. Under [the] program, such loans acquire a priority lien over existing mortgages." Fannie Mae responded to the FHFA statement by providing special instructions for lenders handling mortgage loan applications that involve PACE financing (Fannie Mae, 2010). The guidance included a statement that Fannie Mae would not purchase mortgage loans secured by properties with an outstanding PACE obligation unless the terms of the PACE program do not permit priority over first mortgage liens. This complication has hindered the program and the Cities of Boulder and San Francisco have temporarily suspended their programs as a result. Local governments across the country are currently working with lenders and federal agencies to resolve the issue.

4.0 Summary and Recommendations

As independent economic entities or as enterprise funds within local governments, it is paramount that utilities understand and monitor the financial implications of reducing water consumption. The key to a healthy conservation program is to plan for the reduced consumption and to integrate the effects into the utility's financial strategy. This report includes multiple strategies that are capable of recovering revenue and off-setting DSM program costs; utilities are encouraged to consider these strategies as part of their planning processes. Currently, opportunities to finance DSM program costs are more limited, but it is expected that additional finance options will become available due to the increasing focus on water efficiency by federal, state and local governments. Further, the increased focus on renewable energy and energy efficiency has opened funding and financing doors for water use efficiency and as a result, future financing methods for water and energy conservation are expected to emerge.

This report includes examples of synchronized water and energy management, and there is increasing momentum in the U.S. toward a coordinated effort to conserve both resources. Water/wastewater utilities have recently been identified as one of the largest users of energy. Energy is needed to withdrawal, treat, and deliver water to customers and to pump and treat customers' wastewater. Reduced water use translates to reduced energy for pumping and treatment. Just as water supply utilities require energy for their operation, energy utilities require water for their operation. Water is used to remove pollutants from power plant exhausts, generate steam that turns turbines, flush away residue after fossil fuels are burned, and lower the temperature of power plants through cooling stations. Renewable energy producers harness the energy conveyed by water to generate electricity from hydropower, geothermal, or tidal energy plants. The interconnectivity of energy and water cannot be ignored and both industries rely on each other to sustain the resources they need. Therefore, energy and water providers and managers in SJRWMD are encouraged to work together to identify DSM opportunities that benefit both industries by conserving energy and water resources and leveraging economies of scale.

The remainder of this subsection includes a list of conclusions and recommendations. The list is not a set of mutually exclusive options; rather, they are a menu of revenue and cost recovery mechanisms.

Each utility has a unique set of challenges, customers and resources. Therefore, the options should be further studied and selected at the utility level.

- Long-term water supply development and management are valid utility costs. Revenue requirements should reflect the future incremental cost of "new" water, not just the current cost of water. This can be achieved through marginal cost pricing.
- A conservation rate stabilization fund is a viable revenue and cost recovery mechanism. As a cost recovery mechanism, it is especially useful if the utility is in the planning or the beginning implementation stages of DSM programs. This mechanism allows the utility to build a reserve to fund future DSM measures. It can also help to protect the utility from short-term water use fluctuations.
- To help to stabilize revenues when the District imposes and rescinds watering restrictions, utilities should consider developing drought/water shortage rates and include a provision in their rate resolution that stipulates that drought rates are to be imposed immediately upon declaration of a water shortage by the District. The resolution should also include a provision for non-drought rates to be reinstated immediately upon the District rescinding the restrictions. This option includes the possible benefit of increasing the utility's bond rating because the utility can demonstrate the ability to recover revenue immediately and consistent with the reduced water use, which they may otherwise have little to no control of.
- Conservation surcharges added to a utility's highest tier(s) can be used to help recover revenue and can provide a dedicated funding source for conservation DSM programs.
- An annual index adjustment clause in a utility's rate resolution can be used to account for inflationary effects on operational costs and other cost and revenue impacts without a formal rate hearing or analysis. This option includes the possible benefit of increasing the utility's bond rating because the utility can demonstrate the ability to rebound from under recovering the previous year.
- A feasibility study to further explore decoupling as a revenue recovery mechanism for PSC-regulated water utilities may be worthy of consideration.
- A water loss control program is status quo for any responsible water utility. It is recommended that utilities' water audits use the IWA/AWWA methodology utilizing the water audit software available for free from AWWA. Utilities should implement measures to address apparent losses concurrent with implementing measures that address real losses. Apparent losses are corrected through metering and billing system improvements. These improvements provide more accurate water use data that can be used to further refine estimates of real losses. Further, the revenue recovered from apparent losses and cost savings from reducing real losses can be used to help fund the water loss control program and possibly DSM programs. Towards this effort, the District has funded metering improvements for utilities.
- Cost recovery factors applied to utility customer bills can be used to recover DSM program costs. Utilities will need to evaluate the equity of the factor being levied on all customers, customers of new/future service connections, or participating customers only.
- Local governments can strengthen their implementation of Florida Senate Bill 494 (2009) by requiring utility customers who have in-ground automatic irrigation systems to participate in yearly system inspections to confirm rain or moisture sensor shut-off devices are properly installed and operational. This could be coupled with the utility's backflow prevention program

that requires yearly inspections of backflow preventers. The inspections could be conducted by licensed irrigation contractors or by utility staff for a fee. If the utility provides the inspections for a fee, fees collected from the program could be used to fund the inspection services and other conservation program efforts.

- Hydropoint's SmartYard (see Subsection 3.5) program or a similar turn-key program is worthy of further consideration by utilities. This cost recovery strategy for smart irrigation attaches the program to the account, rather than to the customer.
- Similar to the WMWD's case study presented in Subsection 3.5, utilities could recover half the cost of their smart irrigation program through customer bills. The other half would be eligible for District cooperative funding. SJRWMD utilities currently implementing smart irrigation studies through District funding may consider a broader implementation by augmenting District funds with cost-recovery through participant's bills.
- Local governments and their utilities should consider the benefits of implementing conservation programs that target infrastructure and facilities owned by their government. Important benefits of this program structure include:
    - From the local government's perspective, water use reductions do not result in reduced revenue; rather, it is a transfer payment because the cost savings stay within the government.
    - DSM programs applied to local government infrastructure and facilities can include energy improvements and make use of ARRA funding and/or performance contracting.
    - Local governments can lead their population by example.
- Utilities are encouraged to work with SJRWMD and local electricity providers to coordinate DSM programs such as customer audits, incentives and ESCO services. A coordinated approach could leverage more funding and financing options and enhance customer targeting based on both water and electric bills. Further, water utilities may qualify for incentives from the energy provider if they reduce their energy demand through water DSM. This may be especially true with respect to energy savings attributed to high-service pumping during peak water demand.
- Local governments should further explore PACE financing and get their lobbyists engaged in Federal discussions to resolve issues brought by Freddie Mac and Fannie Mae.
- Local governments should consider establishing a code that requires drillers to obtain a permit to construct irrigation wells within its jurisdiction and utility service area. This would allow for more accurate water use projections for new development. Further, utilities can better plan for revenue reductions from customers who switch from potable to well water for irrigation.

REFERENCES

AWWA, “Water Audits and Loss Control Programs,” 2nd Edition, 1999.

AWWA, “Water Audits and Loss Control Programs,” 3nd Edition, 2009.

CUWCC, “Water Smart Landscapes for California, AB 2717 Landscape Task Force Findings, Recommendations, & Actions, Report to the Governor and Legislature,” December, 2005

Florida PSC, “Report to the Legislature on Utility Revenue Decoupling,” December, 2008.

FHFA, “FHFA Statement on Certain Energy Retrofit Loan Programs,” release date July 6, 2010.

Fannie Mae, “Fannie Mae Selling Guide - Options for Borrowers with a PACE Loan,” Announcement SEL-2010-12, August 31, 2010.

Johns, Grace, “Incorporating Water Conservation into Rate Structures,” Presentation at FSAWWA Fall Conference, Orlando, Florida, December 1, 2009.

MDWASD, “Water Use Efficiency Five-year Plan,” 2005.

MDWASD, “2009 Annual Water Loss Reduction Plan Implementation Status Report,” Report to SFWMD, March 2010.

SFWMD, “Water Utilities Water Demand Reduction during the 2007–2009 Water Shortage Restrictions,” September 2009.

UTILITY SURVEY RESPONSE: City of Leesburg

I. Name of Utility: City of Leesburg

Name of Interviewee: Ray Sharp

Title of Interviewee: Director, Environmental Services/Public Works

Email of Interviewee: ray.sharp@leesburgflorida.gov

Phone No. of Interviewee: 352-435-9442

II. Revenue- and Cost-Recovery Strategies and Financing

a. Traditional revenue- and cost-recovery strategies

i. Reactive – Utility designs conservation program to meet regulatory requirements or to defer capital, but does not initially incorporate reduced water sales into rate making process. Utility experiences a revenue loss and then recovers revenue by raising rates. *Is this what your utility has done/plans to do? Please explain.*

Response: No. Our last three rate studies have extended (steepened) the conservation rate structure. Each of the studies have anticipated reduced demands and therefore, reduced revenues – the rate designs have been constructed with the understanding that there is some elasticity and rate designs must accommodate it. Additionally, the rate studies that we have performed since 2002 have all been cost-of-service based rate studies – this approach, correctly applied, also ensures adequate revenues.

ii. Proactive

1. Marginal cost pricing - Utility designs the conservation program such that the unit cost of conservation is less than the unit benefit of conservation. Reduced sales (due to planned conservation) are built into the rates. *Is this what your utility has done/plans to do? Please explain.*

Response: See above.

2. Conservation Rate Stabilization - rates are set higher than current requirements to generate revenues for a reserve fund which is used to spread the costs of DSM resources over a period of time. A rate stabilization fund requires current ratepayers to pay for the development of

future resources (with conservation being part of that mix of resources). The rate stabilization fund can be used to fund conservation program costs, and to provide financial relief from reduced water sales. *Is this what your utility has done/plans to do? Please explain.*

Response: We are in the process of implementing rate stabilization funds for all of our utilities. However, the purpose is to provide protection for our customers from short-term anomalies and to minimize the impacts of long term trends on rates. To the extent that conservation produces reduced water sales which have not otherwise been accounted for in rate studies and rate design, use of the rate stabilization fund is appropriate.

I do not view the costs of development of future water resources, meaning "new water" as an appropriate use of a rate stabilization fund. The cost of development of new resources should be allocated to the users of the new resources. The bulk of such costs should accrue to new development in the form of impact fees, connection fees, capital recovery fees and the like; some of the cost of development of new resources (conservation, specifically) should accrue to both current and new users. In either case, it is not appropriate to mix "new water" dollars with rate stabilization fund dollars because they are for fundamentally different purposes.

Having said all that, it is quite apparent that a utility must generate funding for both conservation initiatives as well as future water supply initiatives which is separate from operating expenses and separate from facility maintenance and expansion facilities. This means that funds set aside for Repair and Replacement and Impact Fee funds, for example, are not to be used for conservation initiatives. The challenge is to create funding – for us, we have looked at dedicated funding in the form of utility service district fees, applied to the land for future expansion – the current economy makes this unreliable (and expansion unnecessary, for the moment).

One can easily imagine a future water supply fee applied to lands within a utility service area, with the funds dedicated to conservation and other projects targeted at water supply needs. One can also imagine a conservation surcharge applied to water bills to create a dedicated funding source, in which all customers participate.

b. Alternative revenue- and cost-recovery and finance strategies

   i. Revenue recovery through decoupling: Typically utilities' variable costs that translate to the variable rate include fixed costs such as customer service, plant personnel, etc. These unavoidable fixed costs do not decrease with reduced water

use. Decoupling is used by investment owned power utilities (IOUs); it is a means of removing all unavoidable (fixed) costs from the variable costs that go into setting the variable rate. Decoupling severs the relationship between revenue and sales volume. *Has your utility considered this strategy? Would your utility consider this strategy? How do you think your elected officials and customers would respond to this strategy? Please be detailed in your response.*

Response: To a certain extent, our present-day rates incorporate this "decoupling" strategy. The very nature of cost-based rate studies identifies and categorizes such costs. However, there are other concerns which are sometimes in conflict with this strategy. For example, the concept of "life-line" rates dictates that the minimum bill be as small as possible – this often means that the fixed costs are sometimes built into the next higher tier, which is variable, but may be typical of the great majority of customers, thus minimizing the risk. Conversely, at the upper end of the billing rate tier, revenues from volume-based charges may vary widely due to factors that are unrelated to conservation initiatives: one day per week vs. two day per week irrigation, for example (yeah, I know …). An unusually wet or dry period can also affect revenues significantly. A utility must carefully monitor and understand such revenue variations.

"Decoupling severs the relationship between revenue and sales volume." Is an overstatement, in my opinion. One should take some care to ensure that one understands revenues and their sources – broad, blanket statements such as this are a disservice in this context.

Elected officials should understand the principles of cost-based rate studies and rate design. Customer acceptance of this approach is probably mostly dependent on what the customer is accustomed to and their perceptions of fairness.

ii. Conservation costs-recovery factors or clauses: some energy utilities use line item factors/clauses on customers' bills to recover conservation costs. For example, Progressive Energy customer bills include an energy conservation cost-recovery factor of $0.27/kWh, and an environmental cost-recovery clause of $0.593/kWh. *Has your utility considered this strategy? Would your utility consider this strategy? How do you think your elected officials and customers would respond to this strategy? Please be detailed in your response.*

Response: As discussed above, I believe that this is the appropriate approach for new water customers, especially for utilities facing a very large cost of AWS. It is not much of a logical stretch to apply the same notion to conservation costs. A proper implementation structures the revenues received as restricted funds to be expended for conservation programs, only. In addition to the costs discussed

previously, this could be a funding mechanism for a conservation coordination staff, not merely capital and/or project related expenditures.

iii. Utility financing of conservation program costs through general obligation or utility system debt obligations: amortizing conservation program costs can reduce program costs' impact on rates. *Has your utility considered utility financing of conservation programs? Would your utility consider this strategy? How do you think your elected officials would respond to this strategy? Please be detailed in your response.*

Response: Utility financing of such costs will require a dedicated funding source, in our case –not existing revenues. Our review of financing options for utility expansion have clearly shown long term financing (revenue bonds) to be cost effective for infrastructure. I am less certain of conservation. If one is to issue long term debt (20 -30 years), one must be assured that the benefits match the amortization period. It would be unwise to issue 20 year debt for 10 year infrastructure – it would be similarly unwise to issue 20 year debt for a 10 year benefit. So, one must approach the matter with some care.

One significant difference is that long term debt for infrastructure provides immediate benefit and use, while long term debt for conservation may provide only a future benefit that is only realized if a utility's future demands actually use the conserved water supply. As a corollary to this, a utility must be assured that taking on long term debt to conserve water is a future benefit that will accrue to the utility and not to anyone else – I have no interest, nor do my commissioners nor my customers, in financing conservation so that another utility can be allocated groundwater that I have conserved. From a political perspective, I think this becomes the major issue.

iv. Third-party financing of conservation program costs: a private third party agrees to develop, finance and produce a guaranteed amount of water/energy savings within a specified time period by implementing conservation. The avoidedable cost rate developed by the utility is used by private firms to earmark the maximum price of competitive price proposals. The utility evaluates the alternative proposals and negotiates secured contracts to pay the third party for the savings achieved from installing conservation measures. Measurement and verification of the baseline use and water savings are specified in the contracts. *Has your utility considered third-party financing to finance conservation programs? Would your utility consider this strategy? How do you think your elected officials would respond to this strategy? Please be detailed in your response.*

Response: No, we have not considered this, nor are we likely to consider it. Apart from the difficulties of defining the guaranteed savings, measurement and

verification is very difficult to quantify. While such approaches are often sold on the basis of no financial risk to the utilities, I would be reluctant to undertake such a program which entrusts factors so fundamental to the utility's operations (CUP compliance, revenues, customers) to a third party. In my personal view, such approaches are merely a modern-day version of selling snake oil.

v. ESCO-utility relationships – this alternative includes a utility working with an energy/water savings company (ESCO/WASCO) for conservation implementation. For this alternative, the utility has no financial involvement. Rather, the utility provides lists of large multi-family residential/commercial/industrial customers to the ESCO/WASCO, which coordinates water/energy use evaluations and potential performance contracting with the utility customer. *Has your utility considered working with ESCOs? Would your utility consider this strategy? How do you think your elected officials would respond to this strategy? Please be detailed in your response.*

Response: See above – more snake oil.

c. *If not already stated above, how does your utility fund conservation programs now? Does it include financing? Do you expect the current approach to change? How?*

Response: We do not have a dedicated funding source at present. I expect that to change over the next few years as a byproduct of CUP renewal and an increasing awareness on the part of our commissioners that future water supply is limited. Previous workshops with commission have discussed conservation and funding in some detail – conservation is identified for the commission as a key strategy for providing for the city's future water supply needs. We have discussed the need to fund conservation initiatives and projects. The recent conservation pilot study will help our commissioners to understand this strategy and the funding for it.

d. *Has your utility lost revenue as a direct result of conservation program implementation? If so, to what extent and what will the utility to do recover the revenue? If not, what did your utility do right to ensure the financial health of the utility while implementing conservation.*

Response: No. As noted above, the city's rate studies have anticipated the effects of conservation rates and the rate designs have included adjustments to account for the elasticity. Future rate studies, and future conservation initiatives will have to account for anticipated effects upon revenues and structure the rate design accordingly.

e. *How has your utility marketed necessary rate increases to your elected officials and to your customers? How have you avoided the public message or responded to customer concerns that customer conservation equates to increased rates?*

Response: In general, we meet with large HOA's prior to significant rate changes. There is relatively little participation in such meetings (typically 1-3% of the community attend). As with all municipal utilities, we hold public hearings on rate changes as required by statutes. We also hold a workshop with our commission prior to the public hearing. Both the workshop and the public hearings are publicly noticed; the public hearings are noticed on each water bill, as required by statute. We discuss fixed vs. variable costs and we discuss the implementation of conservation rates, the anticipated effects, and the need for conservation. We target specific communities for HOA meetings on the subject of conservation and conservation rates. The presentation goes something like this:

"Hi, I'm Ray.
Your rates are going to go up because you use too much water.
If you want to pay less, use less.
The choice is yours."

f. *Utility strategies to target high-use customers for program participation: for each tool listed below, please indicate if your utility has the tool and if/how the tool is or may be used to target customers for conservation implementation.*

i. CMMS
Response: We have CMMS implemented for our plant and infrastructure. We also have a work order system implemented through our utility billing system. Both systems target unusual occurrences, whether main breaks or customer usage.

ii. AMI

Response: We use AMI on a limited basis. Cost of infrastructure is prohibitive, with little return on investment, when one considers all capital costs, including R&R.

iii. CIS

Response: We have a CIS, as part of our utility billing system. It generates automatic work orders, based on consumption, for re-reads. Meter reader establishes customer contact, in addition to a letter automatically generated for high consumption.

III. What strategies do you implement/intend to implement to address program customer retention?

Response: Not sure what this question means.

UTILITY SURVEY RESPONSE: City of Palm Bay

I. Name of Utility: City of Palm Bay Utilities

Name of Interviewee: Lori Embrey, Lori Bockelman, Dan Roberts

Title of Interviewee: Utilities Accountant, Business Operations Manager, Assistant Utilities Director

Email of Interviewee: Embrel@pbfl.org

Phone No. of Interviewee: 321-952-3410

II. Revenue- and Cost-Recovery Strategies and Financing

a. Traditional revenue- and cost-recovery strategies

i. Reactive – Utility designs conservation program to meet regulatory requirements or to defer capital, but does not initially incorporate reduced water sales into rate making process. Utility experiences a revenue loss and then recovers revenue by raising rates. *Is this what your utility has done/plans to do? Please explain.*

Response: The rates include a usage charge for water customers consisting of inclining blocked rates to promote water conservation. The City has an Annual Index Adjustment built into the rates which has helped to offset the decline in revenues due to water conservation efforts.

ii. Proactive

1. Marginal cost pricing - Utility designs the conservation program such that the unit cost of conservation is less than the unit benefit of conservation. Reduced sales (due to planned conservation) are built into the rates. *Is this what your utility has done/plans to do? Please explain.*

Response: The current rate structure in place since 2004 intended to address continued promotion of water conservation among other factors. The Utilities is updating the Rate Study at this time. Utility rates will be designed to encourage the most efficient use of the City's fixed asset investment and encourage water conservation.

2. Conservation Rate Stabilization - rates are set higher than current requirements to generate revenues for a reserve fund which is used to spread the costs of DSM resources over a period of time. A rate stabilization fund requires current ratepayers to pay for the development of future resources (with conservation being part of that mix of resources). The rate stabilization fund can be used to fund conservation program costs, and to provide financial relief from reduced water sales. *Is this what your utility has done/plans to do? Please explain.*

   Response: The Utilities does not currently have a rate stabilization fund.

b. Alternative revenue- and cost-recovery and finance strategies

   i. Revenue recovery through decoupling: Typically utilities' variable costs that translate to the variable rate include fixed costs such as customer service, plant personnel, etc. These unavoidable fixed costs do not decrease with reduced water use. Decoupling is used by investment owned power utilities (IOUs); it is a means of removing all unavoidable (fixed) costs from the variable costs that go into setting the variable rate. Decoupling severs the relationship between revenue and sales volume. *Has your utility considered this strategy? Would your utility consider this strategy? How do you think your elected officials and customers would respond to this strategy? Please be detailed in your response.*

      Response: Palm Bay Utilities considered and included the fixed cost of operating and maintaining the system in its rate design. Consideration was given to the practicality of setting base facility charges on the relation of fixed vs. variable cost resulting in two (2) fixed components (Customer Service Charge and Base Facility Charge) and a series of variable inclining block rates were established.

   ii. Conservation costs-recovery factors or clauses: some energy utilities use line item factors/clauses on customers' bills to recover conservation costs. For example, Progressive Energy customer bills include an energy conservation cost-recovery factor of $0.27/kWh, and an environmental cost-recovery clause of $0.593/kWh. *Has your utility considered this strategy? Would your utility consider this strategy? How do you think your elected officials and customers would respond to this strategy? Please be detailed in your response.*

      Response: Palm Bay Utilities has not considered this strategy.

   iii. Utility financing of conservation program costs through general obligation or utility system debt obligations: amortizing conservation program costs can reduce program costs' impact on rates. *Has your utility considered utility*

financing of conservation programs? Would your utility consider this strategy? How do you think your elected officials would respond to this strategy? Please be detailed in your response.

Response: Palm Bay Utilities has not considered this strategy.

iv. Third-party financing of conservation program costs: a private third party agrees to develop, finance and produce a guaranteed amount of water/energy savings within a specified time period by implementing conservation. The avoidedable cost rate developed by the utility is used by private firms to earmark the maximum price of competitive price proposals. The utility evaluates the alternative proposals and negotiates secured contracts to pay the third party for the savings achieved from installing conservation measures. Measurement and verification of the baseline use and water savings are specified in the contracts. *Has your utility considered third-party financing to finance conservation programs? Would your utility consider this strategy? How do you think your elected officials would respond to this strategy? Please be detailed in your response.*

Response: Palm Bay Utilities has not considered this strategy.

v. ESCO-utility relationships – this alternative includes a utility working with an energy/water savings company (ESCO/WASCO) for conservation implementation. For this alternative, the utility has no financial involvement. Rather, the utility provides lists of large multi-family residential/commercial/industrial customers to the ESCO/WASCO, which coordinates water/energy use evaluations and potential performance contracting with the utility customer. *Has your utility considered working with ESCOs? Would your utility consider this strategy? How do you think your elected officials would respond to this strategy? Please be detailed in your response.*

Response: Palm Bay Utilities has not considered this strategy.

c. *If not already stated above, how does your utility fund conservation programs now? Does it include financing? Do you expect the current approach to change? How?*

Response: The user rates support the continued conservation of water resources. We continually look for opportunities that add value.

d. *Has your utility lost revenue as a direct result of conservation program implementation? If so, to what extent and what will the utility to do recover the revenue? If not, what did*

your utility do right to ensure the financial health of the utility while implementing conservation.

Response: The Utilities has realized an approximate 3% decrease in water consumption from FY 09 (at July) to FY 10 (at July) while the increase in customers was equal to 3.14%. Taking into consideration the number of foreclosures in Palm Bay, it is estimated that approximately .80% is attributable to conservation. The rates will be designed to encourage water conservation.

e. *How has your utility marketed necessary rate increases to your elected officials and to your customers? How have you avoided the public message or responded to customer concerns that customer conservation equates to increased rates?*

Response: The current rates were implemented as a result of a rate study completed in October 2004. The rates adopted as a result of the study included annual index adjustments. Therefore, there has not historically been an issue with increased rates as a result of customer conservation.

f. *Utility strategies to target high-use customers for program participation: for each tool listed below, please indicate if your utility has the tool and if/how the tool is or may be used to target customers for conservation implementation.*

1. CMMS

Response: Utilities CMMS program is still in the implementation phase. At this time, customer consumption patterns are not captured in CMMS.

2. AMI

Response: Palm Bay is approximately 50% complete with the meter replacement program converting all direct read meters to radio-frequency which data-logs continual flow activity. The information captured by the data-logger is useful in helping customers understand usage patterns.

3. CIS

Response: Palm Bay uses SunGard CX (CIS) Utility Billing Software with a magnitude of reporting capabilities including top ten customers by class, consumption by range (inclining block rate data).

III. What strategies do you implement/intend to implement to address program customer retention?

Response: *Utilities will continue to encourage environmental stewardship programs targeted in its strategic plan and supported by Greenway, Palm Bay Utilities' ISO 14001 Certified Environmental Management System (EMS).*

1. The EMS has focused management attention on achieving energy and water conservation goals and objectives. In addition, satisfaction with service and retention of rate payers is enhanced with improved transparency and trust of the Utilities Department brought about by a certified EMS. Certification of the EMS requires annual 3rd party auditing to an international standard and an annual regulatory compliance evaluation. The 3rd party involvement of an accredited auditing agency (annual certification audit) and of the EPA funded Public Entity EMS Resource (PEER) Center (annual regulatory compliance evaluation) provides credibility and integrity in reporting and publishing environmental information. It also demonstrates a commitment by the Utilities Department to environmental transparency and accountability which has resulted in a greater degree of trust by customers that would be hard to attain in any other way.

2. An important part of EMS is the designation of roles and responsibilities throughout the management structure of the Department, not just within the environmental function. By ensuring that environmental management responsibilities are decentralized overall environmental awareness, involvement, and motivation at both the management and employee level are raised. Another fundamental component of an EMS is senior management support, which is vital for implementation success and for achieving maximum benefits of not only conservation programs but for the mission of the Utilities Department. Senior management commitment is a prerequisite for adequate funding, personnel, and authority to be applied to sustainability commitments. An EMS requires senior management to review performance and make adjustments to policy and the management system, as appropriate. This form of senior management involvement ensures that the Utilities Department remains focused on achieving its evolving environmental goals and objectives. Achieving goals and objectives which are part of the public aspects of an EMS instills confidence by the customer in the competence of Utilities management/workforce and provides another key to customer retention.

3. An EMS utilizes a cyclical management process to achieve continual improvement. Environmental impact mitigation and enhancement result from this process as the Utilities Department identifies its significant environmental impacts, sets objectives and targets, implements environmental management plans, trains personnel, defines responsibilities, monitors progress, and reviews performance. Organizational focus on environmental management creates a strong incentive to reduce environmental impacts: what gets measured gets

managed. In addition, taking advantage of opportunities for pollution prevention and resource conservation lead to a reduction in environmental impacts. Although much of the above goes on behind the scene, the rate payers and customers will reap the benefits and a satisfied customer is a customer who is more easily retained.

UTILITY SURVEY RESPONSE: Gainesville Regional Utilities

I. Name of Utility: Gainesville Regional Utilities

Name of Interviewee: Jennifer McElroy

Title of Interviewee: Utility Engineer

Email of Interviewee: mcelroyja@gru.com

Phone No. of Interviewee: (352) 393-1291

II. Revenue- and Cost-Recovery Strategies and Financing

a. Traditional revenue- and cost-recovery strategies

i. Reactive – Utility designs conservation program to meet regulatory requirements or to defer capital, but does not initially incorporate reduced water sales into rate making process. Utility experiences a revenue loss and then recovers revenue by raising rates. *Is this what your utility has done/plans to do? Please explain.*

Response: GRU is proactive in establishing and promoting conservation programs. Our sales forecasts are carefully planned and annually updated to account for impacts from variable weather patterns, conservation, and the economy.

ii. Proactive

1. Marginal cost pricing - Utility designs the conservation program such that the unit cost of conservation is less than the unit benefit of conservation. Reduced sales (due to planned conservation) are built into the rates. *Is this what your utility has done/plans to do? Please explain.*

Response: Yes, GRU will (1) lower the sales forecast to capture the estimated savings from the conservation program and (2) build in the cost of program implementation into the rate structure.

2. Conservation Rate Stabilization rates are set higher than current requirements to generate revenues for a reserve fund which is used to spread the costs of DSM resources over a period of time. A rate

stabilization fund requires current ratepayers to pay for the development of future resources (with conservation being part of that mix of resources). The rate stabilization fund can be used to fund conservation program costs, and to provide financial relief from reduced water sales. *Is this what your utility has done/plans to do? Please explain.*

Response: GRU does not have a specific rate stabilization fund dedicated to conservation programs; however, we do have a general rate stabilization fund that is used to alleviate upward water rate pressure. There are no plans for a specific rate stabilization fund for conservation.

b. Alternative revenue- and cost-recovery and finance strategies

i. Revenue recovery through decoupling: Typically utilities' variable costs that translate to the variable rate include fixed costs such as customer service, plant personnel, etc. These unavoidable fixed costs do not decrease with reduced water use. Decoupling is used by investment owned power utilities (IOUs); it is a means of removing all unavoidable (fixed) costs from the variable costs that go into setting the variable rate. Decoupling severs the relationship between revenue and sales volume. *Has your utility considered this strategy? Would your utility consider this strategy? How do you think your elected officials and customers would respond to this strategy? Please be detailed in your response.*

Response: GRU has considered revenue recovery through decoupling; however, we believe there are negative impacts that would outweigh possible benefits. Fixed costs make up a greater percentage of our rates than variable costs; therefore, if the fixed costs were billed independent of customer consumption then the cost per kgal use within our three water tiers would be significantly reduced. A reduction in the cost of these tiers would increase the basic cost of water for our lowest users and would not provide enough price signal incentive for our highest users to conserve.

ii. Conservation costs-recovery factors or clauses: some energy utilities use line item factors/clauses on customers' bills to recover conservation costs. For example, Progressive Energy customer bills include an energy conservation cost-recovery factor of $0.27/kWh, and an environmental cost-recovery clause of $0.593/kWh. *Has your utility considered this strategy? Would your utility consider this strategy? How do you think your elected officials and customers would respond to this strategy? Please be detailed in your response.*

Response: GRU is concerned that implementing cost recovery clauses for conservation would be confusing for the customer; however, GRU is currently

conducting a pilot study with a third party company (OPOWER) that compares the customer's current and historical energy consumption with that of their neighbors. This report, which is separate from the customer's bill, provides information on how the customer can improve energy use and provides information on GRU rebates that might benefit their particular household. We are currently considering conducting a similar pilot study for our water customers.

iii. Utility financing of conservation program costs through general obligation or utility system debt obligations: amortizing conservation program costs can reduce program costs' impact on rates. *Has your utility considered utility financing of conservation programs? Would your utility consider this strategy? How do you think your elected officials would respond to this strategy? Please be detailed in your response.*

Response: While it would be preferable for GRU to capitalize (i.e., finance) conservation programs, we have not been able to do so in the past. Due to the unique nature of Florida's water law, GRU does not "own" the water we are allocated by the Water Management Districts; therefore, it cannot be considered an asset for us to borrow against. For this reason, GRU must include the cost of conservation programs in our O&M costs, which have a direct impact on rates since these costs must be recovered each year.

iv. Third-party financing of conservation program costs: a private third party agrees to develop, finance and produce a guaranteed amount of water/energy savings within a specified time period by implementing conservation. The avoidable cost rate developed by the utility is used by private firms to earmark the maximum price of competitive price proposals. The utility evaluates the alternative proposals and negotiates secured contracts to pay the third party for the savings achieved from installing conservation measures. Measurement and verification of the baseline use and water savings are specified in the contracts. *Has your utility considered third-party financing to finance conservation programs? Would your utility consider this strategy? How do you think your elected officials would respond to this strategy? Please be detailed in your response.*

Response: GRU is open to this strategy, but we have not done this in the past. We believe that our elected officials would be open to this model.

v. ESCO-utility relationships – this alternative includes a utility working with an energy/water savings company (ESCO/WASCO) for conservation implementation. For this alternative, the utility has no financial involvement. Rather, the utility provides lists of large multi-family residential/commercial/industrial customers to the ESCO/WASCO, which

coordinates water/energy use evaluations and potential performance contracting with the utility customer. *Has your utility considered working with ESCOs? Would your utility consider this strategy? How do you think your elected officials would respond to this strategy? Please be detailed in your response.*

Response: GRU is open to this strategy, but we have not done this in the past. We believe that our elected officials would be open to this model. For this model, GRU would likely facilitate the initial contact between the ESCO/WASCO and our customers through our large account representatives.

c. *If not already stated above, how does your utility fund conservation programs now? Does it include financing? Do you expect the current approach to change? How?*

Response: To date, our conservation programs have been typically funded through our O&M budget. GRU also pursues grant opportunities as they arise. GRU is open to other funding mechanisms; however, at this time there does not appear to be any viable mechanism for capitalizing (financing) conservation programs.

d. *Has your utility lost revenue as a direct result of conservation program implementation? If so, to what extent and what will the utility to do recover the revenue? If not, what did your utility do right to ensure the financial health of the utility while implementing conservation.*

Response: Yes, we believe that we have lost revenue as a direct result of conservation programs; however, it is difficult to discern what portion of lost revenue is attributed specifically to conservation and not to variable weather conditions or the economy.

e. *How has your utility marketed necessary rate increases to your elected officials and to your customers? How have you avoided the public message or responded to customer concerns that customer conservation equates to increased rates?*

Response: GRU has been open with both the City Commission and our customers regarding the cost of conservation. Our elected officials set policies for maximum, cost effective demand side management programs.

f. *Utility strategies to target high-use customers for program participation: for each tool listed below, please indicate if your utility has the tool and if/how the tool is or may be used to target customers for conservation implementation.*

1. CMMS
2. AMI

3. CIS

Response: GRU has considered, but has not implemented any of the above mentioned tools due to cost.

III. What strategies do you implement/intend to implement to address program customer retention?

Response: Customer Retention for Water Use – As rates increase due to conservation there is a growing concern that water customers will install private wells for irrigation. Customers who irrigate with private wells will likely use more water, since there is no metering required or any price signal to encourage conservation. In our service area private irrigation wells pull from the same source as our drinking water; therefore, the collective irrigation use from private wells has the potential to significantly impact local water levels.

Customer Retention for Conservation Programs – To help our customers identify opportunities to conserve, GRU offers numerous conservation tools and incentives, including free home and business audits, customer educational materials, targeted seasonal marketing, and monthly notifications for our highest users.

The utility is currently partnering with SJRWMD and the University of Florida Program for Resource Efficient Communities (PREC) to implement Phase I of a SMS-based smart irrigation program. For the Phase I program, GRU reviewed billing data to develop a list of potential program participants by identifying high water using homes. Then, through the use of surveys and lawn audits, a final selection of qualified homes was identified. Because smart irrigation technology is relatively new and unknown to most homeowners in GRU's service area, there was a concern that customer participation would be difficult to obtain. Therefore, the program was designed to be as customer-friendly as possible, requiring little to no investment of time or money on the part of the homeowner. GRU provided a turn-key program where the customer's primary involvement was accepting to participate. Trained irrigation contractors installed and programmed the SMS equipment for each participant. Unfortunately, this customer approach did not work well; maintaining water savings and retaining program participants became an issue. Some homeowners removed the equipment; some homeowners did not trust the SMS readings and tweaked the controller settings to require increased watering. GRU concluded that these issues were a result of the participating customers not being invested and involved in the project.

Through use of District cooperative funding, the utility will be implementing a second phase of the SMS program and is now in the planning stages of the project. This second phase will make use of 'lessons learned' from Phase I. It is being designed as a pilot study that will investigate the effectiveness of a performance-based incentive program for smart irrigation technology, which will provide a basis of comparison (to Phase I results) with respect to customer investment and involvement. Phase II will likely consist of the following program components:

- Customers must pre-qualify for participation by taking a brief online course provided through the utility's website. The course will provide details regarding the utility's performance-based incentive program, information about smart technology and the

system that will be installed at their home, and other important participant information. The course will end with a quiz that the customer must pass to be accepted into the program.

- After passing the quiz, the customer will pay for the installation as well as critical system changes necessary for the technology to achieve adequate savings.

- The project will seek to develop a report for the customer that includes a site-specific irrigation water budget and other information needed to set the sensors and program the controller.

- After receiving the appropriate documentation of installation, the utility will provide a rebate to the customer (amount undecided) for installing the equipment. At a later time, probably a year later, the customer will receive a performance-based incentive (amount undecided) if goals identified in the water budget are met by the customer. Basically, the goals should be met as long as the customer retained the equipment and controller settings.

- The utility will provide quarterly goal-attainment reports to the customer.

- The quarterly goal-attainment reports will also include information about resources available online through the utility's website. Website resources will include videos about troubleshooting controller malfunctions, re-setting controllers, etc.

- The customer will receive a Participant's Handbook that will include detailed information about the program, website addresses for additional resources, who to contact for various questions, concerns, and assistance. The Handbook will also include the User's Manual for the technology.

- Customer information is being developed with assistance from University of Florida's Program for Resource Efficient Communities.