Increasing Water Efficiency in Central Arkansas
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Executive Summary

Like many water utilities across the country, Central Arkansas Water (CAW) seeks to promote wise water use among its customers. Current water use in Central Arkansas is rising, and the peak consumption of water in the area is fast approaching current system capacity. To delay the costly expense of increasing system capacity – expanding current plants and potentially building a new facility – CAW identified outdoor irrigation as a key opportunity for increasing water efficiency and reducing peak demands.

Based on research of water efficiency efforts in other cities, CAW’s customer data, and weather and population trends in Central Arkansas, the project team offers the following considerations to increase outdoor water efficiency; these are:

- divide Sprinkler Smart’s structure into residential and commercial programs;
- increase awareness about Sprinkler Smart through traditional and social media;
- increase education about the national WaterSense program;
- implement the advanced meter technology pilot program in Hickory Hills and Wye Mountain;
- perform proactive Sprinkler Smart audits for high-use customers;
- provide personalized water use report cards;
- encourage member cities to require rain sensor shutoff devices in new construction and new sprinkler installations;
- evaluate a seasonal rate program; and,
- implement a sprinkler meter lease program.
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Central Arkansas Water (CAW) is the largest water provider in Arkansas, serving over 400,000 residents in a four-county area.\(^1\) CAW is a public authority governed by a seven-member board of commissioners confirmed by the Little Rock Board of Directors and North Little Rock City Council. The mission of CAW is “to enhance the quality of life for Central Arkansas by delivering high-quality water and dependable service that exceed customer expectations; protecting and ensuring a long-term water supply for future generations; and serving as responsible stewards of public health, utility resources, and the environment.”\(^2\)

Through its Sprinkler Smart program, CAW is afforded a means for addressing peak demand water use to avoid reaching system capacity of 157 MGD (million gallons per day). Peak Demand Management is critical for CAW. Peak Demand Management involves confronting periods of maximum water use whether for a day or a specific time of day. “Peak Day Demand” refers to the day during the calendar year when water demand reaches its maximum; “Peak Time of Day Demand” is the period of the day when the maximum water use occurs, which for CAW is 5:30 to 7:30 a.m. each day.\(^3\)

With the Central Arkansas region’s population increasing, CAW inevitably has to expand its treatment plant capacity to support this projected growth.\(^4\) However, CAW can delay

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\(^4\) This increase is estimated at 5-7% every five years; Lupton, J. (2012, September 24). Metroplan. Personal communication.
increases in treatment plant capacity by reducing wasteful outdoor watering practices.\textsuperscript{5} To address the mounting problem of wasteful outdoor watering, CAW recently introduced the Sprinkler Smart program, a sustainability program to educate its customers about outdoor watering efficiency practices. As part of the Sprinkler Smart program customers can request sprinkler efficiency audits whereby a CAW representative:

- evaluates the sprinkler (irrigation) system for leaks;
- provides information about amount of water needed for outdoor vegetation; and,
- assists customers with programming their sprinkler system controls for optimal, efficient outdoor watering.\textsuperscript{6}

In this report, the project team recommends ways for CAW to increase outdoor water efficiency.

\textsuperscript{5} Outdoor watering practices include both commercial irrigation and household sprinkler systems.  
# Recommendations

**Restructure the Sprinkler Smart Program**

Create a Sprinkler Smart Commercial Program (serviced by UA Extension Service)

Create a Sprinkler Smart Residential Program (serviced by CAW).

Under the current structure, the CAW/University of Arkansas Cooperative Extension Service partnership conducts approximately 80 Sprinkler Smart audits annually. With CAW’s customer base totaling over 124,000 accounts, Sprinkler Smart’s current implementation is not adequate to significantly affect outdoor water use in Central Arkansas.

To promote efficient water practices, CAW aspires to increase the scope of Sprinkler Smart as a key priority; in this vein, the project team recommends separating responsibilities for the Sprinkler Smart program such that CAW focuses on residential accounts and the University of Arkansas Cooperative Extension Service focuses on commercial accounts. The expertise of Cooperative Extension personnel with regard to turf and outdoor vegetation are better suited for interacting and educating a commercial clientele due to their knowledge, experience, and familiarity with landscape practices, soils, and grasses.

CAW’s customer service is geared toward residential accounts by the nature of its enterprise and service arena. CAW also has a sales and marketing department better acclimated to residential customer service. In addition, through its use of contracted meter readers, there is an opportunity to utilize these individuals as water ambassadors and have them disseminate “smart use” information to residential customers, especially those customers using above average amounts of water.

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CAW’s progress in increasing awareness about Sprinkler Smart among its customers remains somewhat elusive. Though 38 percent of CAW customers are taking steps to reduce water use at home, only 19 percent are reducing outdoor water use.\(^8\) CAW, if it is to enhance efficient water use practices, must address the amount of water used in outdoor watering by mounting a larger, more intentional customer awareness campaign about Sprinkler Smart.

In separating target audiences into commercial and residential sectors (as recommended) and through greater market concentration and focus, CAW can more intentionally promote the program with messages better suited for customers’ needs. For residential customers CAW should add a new staff person to specifically promote Sprinkler Smart. The new staff member can expand Sprinkler Smart advertisements to online and mobile platforms in addition to traditional media. The new staff member can also serve as the Sprinkler Smart liaison between CAW’s communications specialist and Advantage Communications.\(^9\)

Sprinkler Smart marketing should continue to use traditional media channels despite an overall increasing trend in online and mobile advertising. As many customers (37%) continue to obtain information via traditional modes, CAW must continue to utilize local traditional media outlets (e.g., local television stations or newspapers).\(^{10}\) CAW must continue to monitor ways in which its customers acquire information and adjust their utilization of traditional media accordingly over time.


\(^9\) Advantage Communications is currently serving as CAW’s marketing firm.

CAW plans to provide customers with electronic options for receiving information about their water use and paying their water bill, thus this mode will likely appeal to more customers over time.\textsuperscript{11} Electronic billing and payment options will almost certainly reduce the percentage of customers who see Sprinkler Smart bill inserts, therefore CAW should phase this advertising program out in the future. In addition, the move to electronic billing and payments provides an opportunity for providing customers a better understanding of the distinctive costs for water. Electronic communication provides an excellent opportunity for CAW to promote the Sprinkler Smart program (as well as other programs) to specific customers identified through the proactive audit program (discussed later). CAW is moving in the right direction to provide customers with online billing and payment, which affords CAW significant opportunity to capitalize on increasing its advertising and marketing through online and mobile channels. These increases in online promotions must include the Sprinkler Smart program.

CAW must expand its social media footprint and social media is potentially one of the easiest and least expensive modes for promoting the Sprinkler Smart program (e.g. using tweets to promote a “daily water savings tip”). In addition to using social media, CAW can educate customers about wise water use by adding a water conservation widget to the CAW website. A widget is a small onscreen device a website administrator can place on a webpage that updates information from another information source. One such program CAW may consider is the widget from \textit{Water: Use It Wisely}, a conservation campaign from Arizona that offers a free water conservation widget.\textsuperscript{12} CAW can easily add the widget to its website to offer customers a variety of water saving tips. Another area of social media that CAW must engage is text messaging and mobile device applications. CAW must consider establishing a program that sends customers information via text message. Through such a program, CAW could feasibly increase on-time bill payments using due date reminders, quickly inform customers about water issues in specific areas (e.g., broken water main), and, most relevant to this research, inform customers with sprinkler meters about the Sprinkler Smart program. For example, Denver Water, which

provides water to the City of Denver and surrounding suburbs, has already implemented a more limited version of this idea for its customers.\textsuperscript{13}

As water dispersion technology advances, CAW must make those advances useful to its customers for decreasing their water use, especially during periods of peak demand. The Environmental Protection Agency program *WaterSense* provides a list of outdoor products for increasing water use efficiency, which include such devices as rain sensor shutoff switches and advanced meters. Another way to increase water efficiency is to educate customers about wise water management practices for their outdoor irrigation systems.

The *WaterSense* program lists outdoor irrigation controllers for managing water use outside of the home that carry the *WaterSense* designation. As an official *WaterSense* partner, CAW can encourage customers to look for the *WaterSense* label to save money and wisely manage water. With residential outdoor systems becoming more common, education programs are crucial to achieving outdoor water efficiency. Water audits of outdoor irrigation systems must increase dramatically if CAW is to realize improvement from advanced irrigation technologies.

CAW should make water audits and customer education a priority (see previous recommendation on customer awareness). The current Sprinkler Smart program strives to increase customer education, but the program relies on dated modes to communicate this information. CAW must revisit its customer education strategies and adapt these

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strategies to emerging and innovative outreach campaigns using more current communication technologies.¹⁶

CAW is currently working on pilot programs requiring the installation of new meters that rely on advanced technology to enable customers to monitor their own water use. The pilot programs are planned in the Wye Mountain and Hickory Hills communities. Wye Mountain is in rural, west Pulaski County and is a relatively new customer area for CAW. Hickory Hills is a neighborhood in West Little Rock that has a high number of outdoor irrigation systems. These communities were selected for a host of reasons – distance, irrigation system use, high water use areas, etc. – though the primary reason is to test these advanced meters.

The primary goals of these pilot programs are to assess the performance of meters in permitting customers the capability to track household water use and in recording accurately the water use per household. Results, if successful, can lead to more efficient water use by customers and cost savings for CAW through future implementation of a similar program for all CAW customers. Moreover, gaining insight into customer activity – monitoring water use electronically (on various devices) and modifying water use (decreased use) – informs CAW of efficient household water use practices and types of educational programs to promote across residential settings.

These meters cost approximately $400 each; about 700 meters are needed in these two pilot communities. CAW plans to have the pilot program started by summer.
Under Sprinkler Smart’s current structure, customers must request an outdoor water audit. Relying on customers to request such an audit is unrealistic and impractical: most CAW customers are not aware that there is a Sprinkler Smart program. If the customer is not aware of the program, there is little likelihood that s/he is aware of his or her water use practices. The project team recommends CAW identify a water-use baseline and proactively conduct outdoor water audits of customers who exceed the baseline. CAW should consider establishing “average water use” as a method for determining a baseline for initiating a household water audit. Audits can also be initiated due to extreme changes in customer use, i.e., a sudden and significant increase in water use.

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The project team recommends CAW provide a regular, recurring customer report card that presents customers with a snapshot of their water use compared to a standard benchmark and their neighbors’ consumption habits. This “CAW-2” – a W-2 for water use – can induce customers to change their water use practices and adapt to the neighborhood norm; soft peer pressure can be an effective means of changing behavior. When people see their own water consumption and how it compares with others, they are more likely to pay attention to the information, which provides a moment of opportunity to convey tips and information about water efficiency. Thus, the “water report card” contextualizes customers’ water use around what these numbers mean and how their water use compares to a city or neighborhood average, which is often enough to change one’s behavior.\(^{19}\)

Providing customers with personalized report cards is common among utility systems. The Sacramento Municipal Utility District piloted such a program in April 2008 with 35,000 of its electric customers. By offering custom comparison reports, the Municipal Utility District realized a 2 percent reduction in energy use compared to customers who received standard electric statements.\(^{20}\) Many of these report-card types of programs are replicated by other electric and natural gas utilities through a software company called OPower. The report card idea is crossing into water utilities through WaterSmart;\(^{21}\) according to WaterSmart, those who participated in its Cotati, California pilot reduced

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consumption by 5 percent. CAW can create and prepare its own reports, or may consider contracting with WaterSmart.

**Exhibit 1. Sample WaterSmart Report Card**

![Sample WaterSmart Report Card](image)


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Having a rain sensor is significant for irrigation water savings, as rain sensor shutoff technology saves about 45 percent more water than systems without this technology.\textsuperscript{23} CAW provides WaterSense showerheads and rain gauges to its customers during promotional events and the project team recommends extending a similar type of program for rain sensor shutoff devices.\textsuperscript{24} Such a program permits customers to purchase a device that works for their specific systems and gives CAW the flexibility to determine the level at which it wishes to subsidize rain sensor technology for customers. These devices can be given to customers as an incentive for agreeing to a Sprinkler Smart water audit. By making this technology available in this manner, CAW unobtrusively updates residential irrigation system records, potentially increases audits performed on outdoor irrigation systems, better promotes customer relations, and increases awareness of its outdoor irrigation education programs.

Rain sensor shutoff devices are an effective, inexpensive method of deterring outdoor irrigation inefficiency, thus the project team recommends CAW encourage its member cities to adopt a policy requiring these devices be installed in all new construction.\textsuperscript{25} With advocacy by CAW and its conservation partners, a local ordinance requiring all new construction and outdoor irrigation systems to include a rain sensor shutoff device can be adopted by cities in CAW’s service area. If such a recommendation cannot be implemented area-wide, it remains particularly effective if implemented in high-use outdoor irrigation communities.


\textsuperscript{24} Currently, this program is offered during the “Fix a Leak” Week program.

\textsuperscript{25} For example, Florida adopted such policy statewide in 2004, see Fla. Stat. § 373.62.
A water rate structure is the way in which a utility pays for providing its service. Typically there are five types of rate structures: flat rates, uniform rates, declining block rates, increasing block rates, and seasonal block rates. CAW uses an increasing block rate, which is the rate method used by a majority of water utilities across the county.26 The project team recommends that CAW study a rate structure to allow higher rates during specific periods of the year.

When diverse and competing objectives are well understood and evaluated, a utility has the opportunity to design a rate structure that does more than simply recover its costs. A properly selected rate structure should support and optimize a blend of various utility objectives and should work as a public information tool in communicating these objectives to customers.27

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CAW should consider amortizing the cost of installation for a sprinkler meter over a fixed period of time (as opposed to the current practice of a set charge at the time of installation). CAW currently charges a $600 fee to install a second water meter for outdoor irrigation use. Though the long term cost savings of installing such a meter are significant, many customers may be reluctant to install this second meter because of its rather significant up-front cost. Initiating a lease program that permits the cost recovery of a sprinkler meter over time can increase the use of these meters as well as more efficiently manage outdoor irrigation (particularly if the meters installed are smart meters).\textsuperscript{28}

\textbf{Implement a Sprinkler Meter Lease Program}

Create a program for CAW customers to lease a sprinkler meter for a monthly fee.

\textsuperscript{28} Many CAW customers are paying sewer rates for water that does not end up being treated. For those who use outdoor sprinkler systems, the cost savings could be considerable.
Appendices

Appendix A: Background of CAW

CAW currently provides water to 400,000 residential and business customers in seventeen cities and communities in Central Arkansas, making it the largest water utility in Arkansas.²⁹ Little Rock and North Little Rock received their water in the late 1800s through the mid-1930s through investor owned utilities. They were held by private interests until 1936 when Little Rock purchased the Arkansas Water Works Company with money from a federal grant and a loan. Subsequently in 1956 North Little Rock purchased the North Little Rock Water Company facilities. Each city had a three-member governing water board to oversee planning, operations, and expansions of these facilities.

The University of Arkansas Little Rock released a study by the Water Study Task Force entitled “Water for Our Future: Overcoming Regional Paralysis” in the year 2000. The study recommended that the North Little Rock Water Department and the Little Rock Municipal Water Works merge into a new entity, CAW (Water for Our Future). The two cities had over 64 years of experience as the water supplier for their respective cities at the time of the study. The report encouraged the two cities to act in the interests of their customers as a reason to incorporate two utilities. These cities unanimously decided to merge the Little Rock Municipal Water Works and the North Little Rock Water Department into CAW. The consolidation agreement was signed by city and water officials on March 5, 2001, with the human resources and operations merger being completed by July 1, 2001.

Today, CAW is governed by a seven-member board of commissioners and a chief executive officer who manages the daily operations and administration. The utility is organized into five departments: engineering, distribution, information systems, finance and customer service, and source and treatment. The two water supplies for CAW are Lake Maumelle and Lake Winona. There are two treatment facilities, the Ozark Point

Water Treatment Plant and the Jack H. Wilson Water Treatment Plant. The service boundaries encompass roughly 360 square miles and have 2,323 miles of pipeline, 23 remote storage facilities, and 22 booster pumping stations.
Appendix B: Points of Comparison

Central Arkansas has enjoyed fresh, clean water at economical rates. The average monthly water bill in 1985 was $8.04, based on average monthly water use of 6.5 ccf (hundred cubic feet, where one ccf equals 748 gallons). Using the Consumer Index Calculator, that same amount of money is equivalent to $17.09 in 2012; however, the average bill today is $12.90.

A comparison of the cost of water to the cost of 20 ounce bottles of soda:

- 1 ccf = 748 gallons; 6.5 ccf = 4,862 gallons
- 1 gallon = 128 ounces
- 4,862 gallons * 128 ounces = 622,333 ounces
- 622,333 ounces / 20 ounces = 31,116.80 bottles
- 31,116.80 bottles * $1.50/bottle = $46,675.20
Appendix C: Fast Facts

Population and Capacity

- Central Arkansas has a population of 671,459 based on the 2010 census. This definition of Central Arkansas approximates the area served by CAW.

- Expected population increases by 2040 are:
  - 2015 = 722,365; 8% from 2010
  - 2020 = 770,640; 7% from 2015; 15% from 2010
  - 2025 = 817,325; 6% from 2020; 22% from 2010
  - 2030 = 862,213; 5% from 2025; 28% from 2010
  - 2035 = 902,516; 5% from 2030; 34% from 2010
  - 2040 = 943,224; 5% from 2035; 40% from 2010

- CAW currently has approximately 124,000 accounts.

- CAW has a current capacity to treat approximately 157 MGD between the 2 treatment plants (133MGD at Wilson and 24 MGD at Ozark Point).

- The current peak day is 125.1 MGD (June 2012), which is approximately 80 percent of total capacity.

- A review of the number of customer accounts over past years reveals small increases leading us to believe that increased water use is not significantly connected to increased customers.

Debt

- CAW’s current debt utilization is 24 percent (total assets divided by total liabilities).

- According to Gary Pittman, CFO at CAW, the national average is 40 percent based on 2005 AWWA Benchmarking Study.

- CAW could have an additional $73 million of debt and still be within the national average.

- Per CAW, this additional debt would result in rate increases of approximately 30 percent.

- Existing treatment facilities could be expanded to add 30 MGD at a cost of $50-$60 million.

• A new treatment facility with a capacity of approximately 25 MGD could be constructed at cost of $60- $80 million

_Critical Months_

CAW currently has the capacity to treat a total of 157 MGD at the two existing treatment facilities. CAW has indicated to the project team that peak day use reaching 80 percent of capacity is considered a danger zone and requires action. Due to high temperatures and low rainfall, the summer months of June, July and August tend to be high use months. The following graph depicts the summer months that have had one or more days of use above 70 percent of capacity. The project team chose to use 70 percent as an indicator that use has been steadily approaching the danger zone. As can be seen, peak days have occurred in August for several years; however, in both 2011 and 2012, there have been one or more peak use days above the threshold in all three of these summer months.
Appendix D: WaterSmart Software Sample Documents

This WaterSmart sample customer report shows how well its existing setup can complement Sprinkler Smart by offering a recommendation for a Sprinkler Smart audit (here called a WaterSmart House Call) and an irrigation controller rebate.³¹

The representations herein show a consumer web portal included in the WaterSmart Software service where customers can logon to a website that allows them to: track their household water consumption; see personalized recommendations on how to use water wisely to reap savings; and, form action plans on implementing WaterSmart’s suggested recommendations.
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