Regional Irrigation System Evaluation Program Phase III Final Report 2014 – 2017

A Cooperative Funding Initiative (N640)

July 19, 2017

Prepared by
Withlacoochee Regional Water Supply Authority

WITHLACOOCHEE REGIONAL WATER SUPPLY AUTHORITY

Southwest Florida Water Management District

Acknowledgements Page

Cooperative Funding Initiative N640
between the
Southwest Florida Water Management District
and the
Withlacoochee Regional Water Supply Authority

With funding by:

Southwest Florida Water Management District

Withlacoochee Regional Water Supply Authority

and

Citrus County Water Resources

Hernando County Utilities

Marion County Board of County Commissioners

Withlacoochee Regional Water Supply Authority
Irrigation Audit and Education Phase III Project (N-640)

Table of Contents

Withlacoochee Regional Water Supply Authority
Irrigation Evaluation and Education Program Phase III (N640)
A Cooperative Funding Initiative

1. Introduction

The Withlacoochee Regional Water Supply Authority (Authority) and several local water utilities partnered with the Southwest Florida Water Management District (District) to provide a water conservation program for single-family residential customers of the water utilities. Under the District's Cooperative Funding Initiative (Initiative), the Authority applied for matching funds to conduct the water conservation program. Single-family residential customers of the water utilities were eligible to apply for and receive a free irrigation system evaluation. Citrus, Hernando, and Marion county utilities participated in the program. The utilities identified those single-family residential customers with the highest water use, typically exceeding 30,000 gallons per month, for potential participation. The evaluations were designed to assess residential irrigation systems and to provide recommendations for conserving water. Recommendations included the use of Florida-friendly™ landscaping techniques, appropriate rainy season or dry season scheduling, efficient irrigation application systems, and improvements to the irrigation system. A professionally certified irrigation contractor developed these recommendations.

2. Program Description

This project targeted existing inefficient, fully operational single-family residential irrigation systems. Participation in this program was anticipated to result in increased water savings and water quality protection. The project included an in-depth inspection of each participant's irrigation system, by zone, followed by a written report to the resident that included efficiency measures per zone. The timing and run cycles for each zone were analyzed and changes recommended. A new rain sensor was installed or the existing one repaired if the existing sensor was non-functional. Each participant also received information and brochures on measures to conserve outdoor water use as part of the educational component designed to maintain the water savings over time (see Appendix C). Approximately one year after the initial evaluation, a sample of participants were offered a follow-up evaluation to determine how many changes were made; the contractor provided an estimate of changes made based on the original recommendations. Each residential account was tracked by the utility to show the actual amount of water used one year prior to the evaluation and for one year following the evaluation. The utility water use data is the primary method used to measure the water savings. While the program was designed to measure water use for one year before and after the evaluation, the utilities have the ability to further track the water use over time. The Authority administered the program and prepared this report.

2.1 Objectives

The District's *Regional Water Supply Plan* states that lawn and landscape irrigation comprises 35 to 60 percent of the residential water used in the Public Supply sector in some of the larger utility services areas in the WRWSA area. This component of the public supply demand represents a significant opportunity for water savings. The water conservation specialists at each of the participating utilities also identify residential outdoor water use as an area with the greatest opportunity for water savings. The regional irrigation evaluation program was initiated to assist participating utilities to reach, maintain and surpass the District's maximum compliance water use rate of 150 gallons of water per capita per day (gpcd), to allow existing sources of water to meet the needs of a growing customer base, and to reduce current and future water demands.

The measurable benefits of the project objectives are identified in the Agreement between the District and the Authority as "*The Project is expected to provide approximately 140 irrigation system evaluations, resulting in a reduction of outdoor water use. Water savings as a result increased efficiency in outdoor water use is expected to provide a positive effect on the AUTHORITY'S regional water supplies*."

2.2 Methodology

The Phase III program consisted of four major components:

a. One hundred and forty irrigation evaluations conducted on-site;
b. Follow-up evaluations for up to 25 percent (35 participants) of the original participants;
c. Recommendations and educational materials provided to each participant to achieve more efficient irrigation; and
d. Analysis of water use from the utilities' data for each participant for one year prior to the on-site evaluation and one year after the evaluation.

The program Agreement was signed on March 25, 2015. The following paragraphs describe the implementation of the Phase III Program.

Initiation. The Authority's Board selected Eco Land Design, Jack Overdorff, as the irrigation system contractor and entered into a contract with Eco Land Design in November 2014. The contractor was responsible for conducting the onsite evaluations, preparing a written report for each homeowner that contained a summary of the evaluation, recommendations for improving irrigation efficiency and providing follow-up inspections to approximately 25 percent of the participants. Phase III evaluations began in January 2015.

Process. Each participating utility, including Citrus, Hernando and Marion county utilities, assigned a staff person to manage their participation in the project and coordinate with the Authority's staff. The local utility personal directed their efforts toward the highest water users in each utility. Directing the program toward the highest users was determined to be the most

effective way to reduce overall water use and to achieve the highest return for the money spent. The local utility staff provided the Authority with a list of names and addresses for direct contact. A brochure, prepared by the District, was mailed to each prospective customer along with an application and a self-addressed stamped envelope (see Appendix A for sample materials).

Based on the previous phases of the Irrigation Audit Program, the process for Phase III was refined for each utility. As the program progressed, some account holders requested evaluations based on word of mouth from neighbors who had participated in the program and were satisfied with the results and from the signs used by the contractor. The District provided the Authority with signs to be used by the irrigation contractor. These signs were placed in the yard for the duration of the on-site evaluation and were useful in generating additional visibility and interest in the program.

Because of the decision to focus on the highest water users, the Phase III project was not generally advertised and no press releases were issued.

3. Program Summary

3.1 Overall Summary of Irrigation System Evaluations

The first on-site evaluation was conducted on January 8, 2015. The on-site portion of the program was extended through April 16, 2016 lasting a total of 15 months. A total of 140 irrigation system evaluations were completed within the three utilities out of a program goal of 140, or 100 percent. Table 3.1 summarizes the irrigation system evaluations completed.

Table 3.1 Irrigation System Evaluation Summary

UTILITY	TARGET NUMBER OF EVALUATIONS	COMPLETED EVALUATIONS	PERCENTAGE OF TARGET
Citrus	46	46	100
Hernando	43	43	100
Marion	51	51	100
TOTAL	**140**	**140**	**100**

3.2 Rain Sensors Installed

A total of 133 rain sensors were installed or replaced at 131 residences. Two residences in Citrus County required two rain sensors. Ninety-five percent of all on-site evaluations needed to have the rain sensor replaced. Table 3.2 shows the breakout of rain sensor installation by utility. Installation of a new rain sensor was counted if the sensor had to be replaced entirely or

in part. If the sensor was re-set or moved to a new location, it was counted as an operational sensor.

Table 3.2 shows the number of rain sensors installed per utility and the percentage of rain sensors installed based on the total evaluations performed. As can be seen, a clear majority of participants had to have a new rain sensor installed. The utility with the highest percentage of functioning rain sensors was Marion County, at 13.7 percent.

Table 3.2 Rain Sensor Installation per Utility

Utility	Total Evaluations	Installed or Repaired		Functional Sensors	
		NUMBER	PERCENT	NUMBER	PERCENT
Citrus*	46	47	97.8	1	2.2
Hernando	43	42	97.7	1	2.3
Marion	51	44	86.3	7	13.7
Totals	**140**	**133**	**95.0**	**9**	**6.4**

* In Citrus County, two participants had two rain sensors replaced, while one participant had a functioning rain sensor.

3.3 Follow-up Evaluations

The Initiative Agreement between the Authority and the District, as amended, stated that follow-up evaluations be conducted on approximately 25 percent of the irrigation evaluation sites. Based upon the 140 completed evaluations, the target number of follow-up evaluations was 35. The Authority achieved the 25 percent follow-up evaluation rate, completing 35 re-inspections. The follow-up inspections were designed to occur approximately 12 months following the initial evaluation. Over the course of a year, customers had the opportunity to implement some or all of the recommendations and to establish more efficient irrigation practices. During the follow-up inspection, the contractor reviewed each of the sites based on the initial evaluation. He determined how many changes were actually made and provided a percentage of recommendations followed. These items were noted on the original inspection form and provided to the homeowner, to the Authority, and to each utility. The follow-up evaluations ended in February 2017.

Table 3.3 summarizes the total number of completed follow-up evaluations by utility.

Marion County had the largest number of follow-up inspections with 13, while Citrus and Hernando each had 11. The distribution of follow-up evaluations among utilities is influenced by the ability of the contractor to have homeowners agree to the follow-up.

Table 3.3 Follow-up Evaluations by Utility

UTILITY	NUMBER OF EVALUATIONS	TARGET NUMBER OF FOLLOW-UPS BASED ON EVALUATIONS	ACTUAL FOLLOW-UPS
Citrus	46	11	11
Hernando	43	11	11
Marion	51	13	13
TOTALS	**140**	**35**	**35**

3.4. Total Water Savings

For this Phase III program, 140 single-family residential irrigation systems were evaluated. A number of these participants were excluded from the pre-evaluation and post-evaluation water use analysis due primarily to not having reliable monthly water use data for a sufficient period prior to and after the irrigation audit. Five accounts were excluded due to a lack of reliable water use data, leaving a total of 135 accounts included. Three of these excluded accounts were in Hernando County while two were in Marion County. Some accounts with less than a full 12 months pre- and post-evaluation data have been included. If an account had at least 5 months of pre-evaluation water use data and post-evaluation water use data was available for the same 5 months, the account was included in the analysis. For accounts with less than 12 months pre- and post-evaluation water use data, the data that was available was expressed as a monthly average and then multiplied by 12 to calculate the pre- and post-evaluation 12 month values. Nineteen accounts had partial pre- and post-evaluation data, with ten being in Hernando County and nine in Marion County. Pre- and post-water use data by participant, as well as the calculation of change in water use, are provided in Appendix E.

Total annual water savings for these 135 accounts was 7.362 million gallons, or 20,169 gallons of water per day. This represents a 17 percent reduction. The total amount of water used in the pre-evaluation and post-evaluation period by these accounts is shown in the Table 3.4, broken out by utility.

Table 3.4 Water Savings by Utility

HOUSEHOLDS		**ANNUAL WATER USE** (Million Gallons)			**DAILY SAVINGS**	
Utility	***Evaluations with Pre/Post Use***	***One-Year Pre-Evaluation Use***	***One-Year Post-Evaluation Use***	***Water Saved***	***Gallons Per Day***	***Percent***
Citrus	46	14.979	13.189	1.790	4,904	12%
Hernando	40	13.947	10.087	3.861	10,577	28%
Marion	49	14.985	13.274	1.711	4,688	11%
TOTALS	**135**	**43.911**	**36.550**	**7.362**	**20,169**	**17%**

The most water in total gallons saved was in Hernando County, with a total of 3.861 million gallons over the course of a year, for a 28 percent reduction in water use. Using gallons per account per day (gpad), it is possible to compare the water savings per utility. For instance, Hernando County accounts saved an average of 252 gpad, Citrus County accounts saved 107 gpad and Marion County accounts saved 96 gpad.

Water Use Variables. The total amount of water used for irrigation will vary over time for a variety of reasons. While this program did not attempt to control for changes in pre- and post-water use caused by factors other than implementation of the audit recommendations, it is important to recognize some of the other possible causal factors. Other factors include when homeowners make seasonal time adjustments or periodically turn the irrigation system off. Actual rainfall amounts varying over time and place is also a significant factor influencing water use. Rainfall amounts were examined for the pre and post periods by county and are summarized in Table 3.5.

As can be seen, there is significantly less rainfall in each county's post-audit period when compared to the pre-audit period. This would tend to cause outdoor water use to increase, working against the project's goal to reduce water use. Other variables in the amount of water used may include changes in account status per residence, filling swimming pools, or establishing new lawns. In addition, changes in watering restrictions within the local government may affect the amount and frequency of lawn irrigation.

Table 3.5 Pre and Post Period Rainfall by County

County	Time Periods	Cumulative Rainfall
Citrus		
	Pre: Feb '14 - July '15	89.39
	Post: Feb '15 - July '16	78.74
Difference		-10.65
Hernando		
	Pre: March '14 - April '16	123.11
	Post: March '15 - April '17	106.46
Difference		-16.65
Marion		
	Pre: May '14 - April '16	105.55
	Post: May '15 - April '17	92.28
Difference		-13.27

Data obtained from the SWFWMD

3.5 Per Capita Water Savings

This water conservation program was initiated between the District and the Authority to assist utilities to meet, maintain, or surpass the SWFWMD's maximum compliance per capita rate of 150 gpcd required by the District. As shown in Table 3.6, the amount saved on a per capita basis ranged from a low of 75 gpcd to a high of 167 gpcd.

Table 3.6 Water Saved Per Capita

Utilities	Persons Per Household [1]	Pre-Evaluation Per Capita Use	Post-Evaluation Per Capita Use	Water Saved Per Capita Per Day
Citrus County	2.20	405	357	48
Hernando County	2.38	434	314	120
Marion County	2.35	380	337	43

[1] 2010 Census. American Fact Finder, "Community Facts." *Table DP-1. Profile of General Population and Housing Characteristics: 2010: Average household size*. Retrieved from www.factfinder2.census/gov on 1/22/2014. The average household size for Hernando and Marion counties is calculated for the entire county. The average household size for Citrus County is for the zip code area, retrieved from the zip code tabulation provided by the US Census Bureau.

3.6 Program Costs

The total program costs were budgeted for $71,100 pursuant to the Agreement. Total program expenditures were $70,102.33 or 99 percent of the original budget. The on-site evaluation expense was $340 per evaluation, for a total evaluation cost of $47,600. Replacement of rain sensors was at an expense of $75 per rain sensor, for a total cost of $9,975. The project included an administrative fee at $50 per evaluation, for a total cost of $7,000. Marketing and outreach costs were $2,027. The cost for the follow-up inspections was $3,500. Pursuant to the District's methodology for estimating cost per thousand gallons saved, the project resulted in $2.38 per 1,000 gallons of water saved.

Pursuant to the Initiative Agreement, the District provided 50 percent of the total funding, not to exceed $35,550. The Authority and the participating utilities shared the other half. The Authority was responsible for 25 percent with each utility contributing 25 percent of the total cost for their respective portion of the program, with the exception of the Administrative fee, which the Authority assumed the full fifty percent share. In addition, the participating utilities provided critical support by identifying high water users as potential participants, contacting customers, coordinating with the Authority, and providing water use data for participating customers.

Table 3.7 shows the cost of the program among the various funding entities for each major component of the program. Costs are shown for the District, the total amount for each utility (Authority and utility combined), and the total cost per component. The actual direct cost to each utility is shown on the last row of the table. This is the program cost to each utility after subtracting the funds provided by the Authority. The Authority's total final cost is $19,275.59.

Table 3.7 Expenditures Per Utility

Irrigation Evaluation Program Costs						
Item	**SWFWMD**	**WRWSA**				**Total**
		Citrus	**Hernando**	**Marion**	**Subtotal**	
Irrigation Evaluations	$23,800.00	$7,820.00	$7,310.00	$8,670.00	$23,800.00	$47,600.00
Rain Sensors	$4,987.50	$1,762.50	$1,575.00	$1,650.00	$4,987.50	$9,975.00
Administration	$3,500.00	$1,150.00	$1,075.00	$1,275.00	$3,500.00	$7,000.00
Marketing	$1,013.67	$482.31	$492.30	$39.06	$1,013.67	$2,027.33
Follow-up Inspections	$1,750.00	$550.00	$550.00	$650.00	$1,750.00	$3,500.00
Total	$35,051.17	$11,764.81	$11,002.30	$12,284.06	$35,051.17	$70,102.33
Final County Cost - Excluding Admin.		$5,307.40	$4,963.65	$5,504.53	$15,775.58	

4. Customer Implementation

Each follow-up evaluation included an estimate of the changes made by the customer based on the original evaluation and recommendations provided. A sample of a complete evaluation is contained in Appendix B. The evaluation form was used to provide a written set of recommendations to each customer. On the follow-up inspection, the contractor used the last column of the form to note whether changes were implemented. The results of the follow-up inspections are included in this section.

4.1 Implementation Rates for Efficiency Recommendations

About a year after the first on-site evaluation, the irrigation contractor began scheduling follow-up appointments with customers. He reviewed the irrigation system on each site using the original written evaluation. Based on the changes made to the system relative to the written evaluation, an implementation rate was determined for completion of water conservation measures (Section 3.3 covers the number of follow-up evaluations). The implementation rate is not necessarily indicative of the potential or actual water savings. Some changes to system components may have a greater impact on one system than another depending on the severity of the particular issue and the corresponding changes to the systems. Table 4.1 summarizes the follow-up evaluations conducted for participants within each utility as well as the average for all follow-ups. Appendix F summarizes the follow-up inspections.

Table 4.1 Summary of Follow-up Findings

UTILITY	FOLLOW-UP INSPECTIONS	PERCENT OF CHANGES IMPLEMENTED	ESTIMATE OF EXISTING WATER USE (GAL/YEAR)	ESTIMATE OF POST WATER USE (GAL/YEAR)	PROJECTED ANNUAL GALLONS SAVED	PERCENT SAVED
Citrus	11	47	4,562,480	3,837,774	724,706	15.9%
Hernando	11	36	3,230,448	2,558,192	672,256	20.8%
Marion	13	57	4,119,440	2,166,008	1,953,432	47.4%
Total	35	48	11,912,368	8,561,974	3,350,394	28.1%

Potential changes included relocation of heads, changes in types of heads, eliminating or removing items that block the spray pattern or coverage, repairing or replacing leaking or broken heads, reducing turf areas, reducing areas of overspray, and capping heads in areas where irrigation is not needed. All customers who participated in the follow-up evaluations made some changes to their irrigation systems, ranging from 10 to 95 percent, for an overall implementation rate of 48 percent.

The installation or repair of the rain sensor by the irrigation contractor and alterations to system run times were not included in the percent of changes implemented.

4.2 Customer Satisfaction Surveys

A customer satisfaction survey was prepared using Survey Monkey. The complete survey and results are included in Appendix D. A total of 48 responses were received, for a response rate of 34 percent.

Eighty-five percent of respondents reported making at least some changes to their irrigation systems. Seventy-two percent reported adjusting, repairing or replacing irrigation heads, followed by adjustments to irrigation system run times (58%). Forty-seven percent reported using less water after implementing the recommendations. Respondents were asked to rate the overall evaluation process by selecting “Pleased,” “Very Pleased,” “Dissatisfied,” or no response. Of the respondents, 97 percent selected “Pleased” or “Very Pleased” with the irrigation system evaluation.

Appendices

A. Marketing Materials

B. Sample Evaluation Report

C. List of Educational Materials

D. Customer Satisfaction Survey

E. Water Use Data by Utility

F. Summary of Follow-ups

Appendix A

Marketing Materials

DATE

ADDRESS

Dear :

The enclosed application is for a free evaluation of your irrigation system. This free evaluation is part of a water conservation program conducted by COUNTY NAME Utilities in coordination with the Southwest Florida Water Management District and the Withlacoochee Regional Water Supply Authority.

Please fill out the application and return it in the enclosed stamped, self-addressed envelope. If you are not in Florida at the present time, but will be returning prior to the end of DATE, please note a return date on the application. Jack Overdorff, the contractor who performs the evaluations, will contact you near that time to schedule an appointment.

We look forward to hearing from you. If you have questions, please call me at 352-527-5795.

Sincerely,

Nancy H. Smith

Administrative Assistant

Enc.

FREE Irrigation System Checkup In Progress

To participate, please call

(352) 527-5795

WITHLACOOCHEE REGIONAL WATER SUPPLY AUTHORITY

SEAL OF HERNANDO COUNTY · FLORIDA · 1843 · HERNANDO

Southwest Florida Water Management District

WATERMATTERS.ORG · 1-800-423-1476

11/09/2015

Irrigation System Evaluation

Would you like a **FREE** irrigation system evaluation? Want to **lower your water bill** by optimizing your outdoor water use? Water-efficient landscaping equipment and practices can reduce water bills and help protect Florida's precious water resources.

Some irrigation systems have damaged sprinkler heads, heads that are incorrectly angled and sized for the area, or heads programmed to overwater zones. You may not even know if a problem exists, but participating in this evaluation is a good way to find out.

Evaluations:
The Withlacoochee Regional Water Supply Authority and the Southwest Florida Water Management District are offering a limited number of free evaluations to qualified residents. Eco-Land Design, a certified irrigation auditor, will visit your home to:

- Perform an irrigation system evaluation
- Install a free rain sensor if you do not have an operable sensor
- Evaluate your time clock and sprinkler zones for water efficiency
- Provide a detailed report with suggestions that could improve the operation and effectiveness of your irrigation system
- Supply information on Florida-Friendly Landscaping™ principles and other landscape-related information

Qualifications:
You must be a single-family residence using 30,000 gallons of water or more per month; have a fully functional irrigation system with no leaks, breaks or repair needs; and you must be a customer of one of the following utilities:

- Citrus County Utilities
- Hernando County Utilities
- Marion County Utilities
- Village Center Community Development District
- North Sumter County Utility Dependent District

To participate, complete and return the attached application by

_____

The number of free evaluations is limited.

For further information, call the program administrator at **(352) 527-5795**.

This irrigation system evaluation pilot program is funded by

Marion County FLORIDA

Withlacoochee Regional Water Supply Authority

Sponsored by a grant from the Coastal Rivers and Withlacoochee River basin boards of the Southwest Florida Water Management District

WATERMATTERS.ORG · 1-800-423-1476

Appendix B

Sample Evaluation Report

Eco Land Design
landscape architecture studio

7615 Terrace River Drive
Tampa, FL 33637
Ph: (813) 466-8705
E-Mail: ecolandfl@gmail.com

Residential Landscape/Irrigation Evaluation Report

Evaluator: Jack Overdorff, RLA

Date:

Resident Name:

Address:

E-mail:

Report Overview:

On Monday, July 22nd, 2013, a site inspection was conducted for the irrigation system at the above referenced residence. The irrigation system is connected to the potable (drinking) water supply.

A visual inspection as well as a more in-depth review of the irrigation system was conducted. The findings are outlined below as well as recommendation for addressing the system issues and setting of watering durations.

Turf Area

Checklist:

Item	Location	Functioning?
Time clock	Garage wall of the residence	Program A, Zones 1-8 Program Running Days:, Tuesday, Thursday & Saturday @ 1am Zones #1 thru #3, #7 & #8 running 40 minutes Zones #2 & #3 running 40 minutes Zone #4 running 30 minutes Zone #5 running 20 minutes Zone #6 running 55 minutes Program B, Zone 2 Program Running Days:, Mon., Wed., Fri. & Sat. @ 5:15am Zone #2 running 35 minutes Low Volume Zone (Hose bib battery valve) Program Running Days: Every 3 days #9 running 45 minutes
Rain sensor	East Side	No, new wired sensor installed and functioning correctly
Backflow Preventer	Side yard	Yes

Evaluation:

Area	Observation	Action	Addressed by Homeowner
General	Spray Heads & Rotor Heads have irregular head spacing	Recommend moving heads and adding heads as noted below to achieve head to head coverage and improve the spray pattern coverage	

	The overall turf maintenance can be reduced as large turf areas are difficult to maintain	Recommend reducing the turf areas by installing Florida Friendly Landscape materials that are suited for the site conditions.	
	Zones are irrigating turf and landscape beds within the same zone	It is not recommended to irrigate turf and landscape beds within the same zone as each have different water requirements. Recommend separating the landscape beds and turf/lawn areas into separate zones	
	Spray Heads in the landscape beds are being blocked by plant material	Recommend making adjustments as noted below to improve the irrigation coverage	
	Several heads are of a different manufacture than other heads on the zones	It is not recommended to use different manufacturer's equipment within a zone as the spray nozzle precipitation rates vary between the different manufactures and can create uneven coverage. Recommend installing all of the same equipment fitted with matched precipitation rate nozzles on each zone.	

Zone #1 **Rotor Zone** **Side Yard Turf Area** **(See attached site plan)**	Water can be conserved as Rotor Head R1 is leaking	Recommend replacing the head with a similar large turf Rotor Head similar to other heads on the zone fitted with a matched precipitation rate spray nozzle	
	Water can be conserved as Rotor Head R4 is overspraying onto the street	Recommend adjusting the spray pattern to reduce overspray and to conserve water	
	Zone is operating at approximately 9 Gallons Per Minute (GPM)	No action	
Zone #2 **Rotor Zone** **Side Yard Turf Area** **(See attached site plan)**	Water can be conserved as Rotor Heads R5 thru R7 are irrigating a narrow turf area and overspraying mature plantings	Recommend replacing the heads with fixed Spray Heads fitted with strip spray nozzles to reduce overspray and to conserve water	
	Spray pattern coverage for the turf areas can be improved as Rotor Head R6 is set too low and blocked by the surrounding turf areas	Recommend raising the head and also recommend trimming the turf around the head to conserve water	

	Zone is operating at 10 Gallons Per Minute (GPM)	No Action	
Zone #3 **Rotor Zone** **Front Yard Turf Area & Landscape Beds** **(See attached site plan)**	Spray pattern coverage can be improved as rotating Spray Head #1 is located in a planting bed	Recommend moving the head to the turf area for better coverage	
	Water can be conserved as Rotor Head R8 is overspraying onto the street	Recommend adjusting the spray pattern to reduce overspray and to conserve water	
	Zone is operating at approximately 11 Gallons Per Minute (GPM)	No action	
Zone #4 **Spray Zone** **Side Yard Turf Area** **(See attached site plan)**	Spray pattern coverage can be improved as Spray Head #2 does not have head to head spray pattern coverage for the turf areas	Recommend adding a similar fixed Spray Head at the street fitted with a matched precipitation rate spray nozzle to improve the spray pattern coverage for the turf areas	
	Water can be conserved as Spray Head #8 is overspraying onto the air conditioning unit	Recommend adjusting the spray pattern to reduce overspray, conserve water and prevent water damage to the air conditioning unit	

	Water can be conserved as Spray Head #9 is overspraying onto the residence	Recommend adjusting the spray pattern to reduce overspray, conserve water and prevent water damage to the residence	
	Spray pattern coverage can be improved as Spray Head #10 is set too low and blocked by the surrounding turf	Recommend raising the head or replacing the 4" tall Spray Head with a 6" tall Spray Head to improve the spray pattern coverage for the turf area	
	Zone is operating at 6 Gallons Per Minute (GPM)	No action	
Zone #5 Spray Zone Front/Side Yard Planting Beds & Turf Areas (See attached site plan)	Spray pattern coverage can be improved for the turf areas as Spray Heads #17, #18 & #19 are blocked by the plantings	Recommend moving the heads to the turf area to improve the spray pattern coverage for the turf	
	Water can be conserved as Spray Heads #11 thru #15 are irrigating mature plantings	Recommend replacing the heads with low volume dripline or micro-irrigation on a separate low volume zone to conserve water	
	Water can be conserved as Spray Head #16 is irrigating an area covered by low volume dripline	Recommend capping the head to conserve water	
	Zone is operating at 12 Gallons Per Minute (GPM)	No action	

Zone #6 **Spray Zone** **Side/Rear Yard Turf Area & Landscape Beds** **(See attached site plan)**	The zone efficiency can be improved as Spray Heads #21 thru #25 are irrigating mature plantings on a turf zone	Recommend replacing the heads with low volume dripline or micro-irrigation on a separate zone to improve the zone efficiency and to conserve water	
	Water can be conserved as Spray Head #28 is overspraying onto the residence	Recommend adjusting the spray pattern to reduce overspray, conserve water and prevent water damage to the residence	
	Spray pattern coverage can be improved as Spray Heads #30 thru #32 have low pressure	Recommend capping heads irrigating mature plantings and/or moving heads to zone 2. Also, recommend further investigating the issue to determine the appropriate solution	
	Spray pattern coverage can be improved as Spray Head #32 is set too low and blocked by the surrounding turf	Recommend raising the head or replacing the 4" tall Spray Head with a 6" tall Spray Head to improve the spray pattern coverage for the turf area	
	Zone is operating at 13 Gallons Per Minute (GPM)	No action	

Zone #7 **Rotor Zone** **Side Yard Turf Area** **(See attached site plan)**	Water can be conserved and the spray pattern coverage improved as Rotor Head R13 is leaking and blocked by plantings	Recommend replacing the head with a similar large turf Rotor Head similar to other heads on the zone fitted with a matched precipitation rate spray nozzle. Also, recommend trimming plantings to improve the spray pattern coverage	
	Spray pattern coverage can be improved as Rotor Head R14 is leaning	Recommend straightening the head to improve the spray pattern coverage for the turf areas	
	Zone is operating at 8 Gallons Per Minute (GPM)	No action	
Zone #8 **Rotor Zone** **Side Yard Turf Area** **(See attached site plan)**	Water can be conserved as Rotor Head R15 is overspraying onto the street	Recommend adjusting the spray pattern to reduce overspray and to conserve water	
	Water can be conserved as Rotor Head R17 is located in a planting bed	Recommend capping the head and irrigating plantings with only dripline or micro-irrigation	
	Zone is operating at 10 Gallons Per Minute (GPM)	No action	
Zone #9 **Low Volume Zone** **(See attached site plan)**	Zone is operating at 4 Gallons Per Minute (GPM)	No action	

A catch can test was performed on Zones #4 & #7 to determine the system spray uniformity and also determine appropriate run times for the scheduled waterings in order to achieve a 1/2" to 3/4" application rate. .

Zone #4 is running at 6 gallons per minute and according to the catch can test, is operating at 45% spray uniformity for the Zone (above 70% is considered to be good). This zone is applying 1.38" of water per hour. The lawn has areas of distress. If the recommendations above are made to the system with the application rate increased to 1.40" per hour and the spray uniformity improved to 70%, it is recommended that the zone runtime be set at 30 minutes once per week to achieve a 1/2" application rate. Also, based on the existing soil profile (sandy clay) and root depth it is recommended that the runtime be completed in one application.

Zone #7 is running at 8 gallons per minute and according to the catch can test, is operating at 52% spray uniformity for the Zone (above 70% is considered to be good). This zone is applying .68" of water per hour. The lawn has areas of distress. If the recommendations above are made to the system with the application rate increased to .70" per hour and the spray uniformity improved to 70%, it is recommended that the zone runtime be set at 60 minutes once per week to achieve a 1/2" application rate. Also, based on the existing soil profile (sandy clay) and root depth it is recommended that the runtime be completed in one application.

Irrigation Schedules:

The Watering schedule below (Left Side) reflects the information recorded from the irrigation controller at the time of the inspection by the irrigation evaluator called (Pre-inspection zone runtimes and water usage). The water schedule below (Right Side) reflects recommended changes to the watering times and frequency based on the evaluation inspection called (Post-inspection zone runtimes and water usage). These modifications can create significant water savings in many cases.

The suggested runtimes reflect the fact that Spray Heads deliver more water than rotor sprinklers during a given time period and that turf grasses typically require more frequent irrigation than most plants and shrubs. Following the Post Inspection suggested runtimes will allow for deeper development of turf grass roots, greater soil moisture retention and help promote a more drought resistant turf. Over-watering allows water to travel beyond the root zone, while under-watering may cause shallow roots that will dry out quickly

Plant type	Pre-inspection zone runtimes And water usage	Plant type	Post-inspection suggested runtimes And water usage
	Program A (3 application times per week)		Program A (1 application time per week)
Turf	Zone 1 (Rotor) - 40 mins = 360 Gal	Turf	Zone 1 (Rotor) - 60 mins = 540 Gal
Turf	Zone 2 (Rotor) - 40 mins =400 Gal	Turf	Zone 2 (Rotor) - 60 mins =600 Gal
Mixed	Zone 3 (Rotor) - 40 mins = 440 Gal	Turf	Zone 3 (Rotor) - 60 mins = 660 Gal
Turf	Zone 4 (Spray) - 30 mins = 180 Gal	Turf	Zone 4 (Spray) - 30 mins = 180 Gal
Mixed	Zone 5 (Spray) -20 mins = 240 Gal	Turf	Zone 5 (Spray) -30 mins = 360 Gal
Mixed	Zone 6 (Spray) - 55 mins = 715 Gal	Turf	Zone 6 (Spray) - 30 mins = 390 Gal
Turf	Zone 7 (Rotor) - 40 mins = 320 Gal	Turf	Zone 7 (Rotor) - 60 mins = 480 Gal
Turf	Zone 8 (Rotor) - 40 mins = 400 Gal	Turf	Zone 8 (Rotor) – 60 mins = 600 Gal
	Program A - Current Total Water Usage (per application) = 3,055 Gallons per application x 3 applications per week =9,165 Gallons per week		Program A - Total Water Usage (per application) after run time modifications = 3,810 Gallons per week
	Program C (4 application times per week)		Program C (0 application time per week)
Turf	Zone 2 (Rotor) - 35 mins =350 Gal	Turf	Zone 2 (Rotor) - 0 mins =0 Gal
	Program C - Current Total Water Usage (per application) = 350 Gallons per application x 4 applications per week = 1,400 Gallons per week		Program C- Total Water Usage (per application) after run time modifications = 0 Gallons per week

	Hose Bib Battery Valve (2.5 application times per week)		Hose Bib Battery Valve (2.5 application times per week)
Plants	Zone 9 (Low Vol.) - 45 mins = 180 Gal	Plants	Zone 9 (Low Vol.) - 45 mins = 180 Gal
	Hose Bib Valve -Current Total Water Usage (per application) = 180 Gallons per application x 2.5 applications per week = 450 Gallons per week		Hose Bib Valve -Current Total Water Usage (per application) = 180 Gallons per application x 2.5 applications per week = 450 Gallons per week
	Current Total Water Usage (per application) = 11,015 Gallons per week		Total Water Usage (per application) after run time modifications = 4,260 Gallons per week

*Plant type has three terms: Turf Only, Plants/Shrubs only and Mixed (combination of Both)

a. Consider placing these charts next to your controller.
b. Consider skipping your watering day when there is significant rainfall 1/2 half inch or more).

When watering your lawn and landscape **please observe the local water use restrictions**.

Please check for any changes to the current watering restrictions at: http://swfwmd.state.fl.us/conservation/restrictions/swfwmd.php

Additionally, seasonal adjustments may also be used to further reduce water use during the winter months (December, January and February) when root growth is minimal thus requiring much less water. By watering every other week during the winter months an additional 25,560 gallons could be saved. The controller also has a seasonal adjustment capability that can also be used to adjust runtimes of all zones by increasing or reducing the percentage of application time; during the rainy season or in winter months when plant materials are not in a growth cycle, the controller's seasonal adjustment can be set at 60% to 80% of the current application rate to conserve water.

Also note: additional water savings can occur by repairing leaks, removing heads, capping heads and changing nozzles on heads as noted above.

The chart below reflects how much water is currently used compared to the Post-evaluation water use with adhering to the recommendations noted above.

Estimate of existing water usage[1]	Post-evaluation water use [2]	Projected annual gallons saved[2]	Projected Annual Gallons Saved w/ Skip a Week[2]
11,015 GAL/CYCLE/WEEK	4,260 GAL/CYCLE	6,755 GAL/CYCLE	**4,260 GAL/CYCLE**
572,780 GAL/YEAR	*221,520 GAL/YEAR*	*351,260 GAL/YEAR*	**376,820 GAL/YEAR (66% Annual Savings)**

[1] Based on watering days and applications as noted above
[2] Based on 1 day a week watering with 1 application per day

Not only is it important to follow these recommendations because it will help conserve the water supply in the Coastal Rivers and Withlacoochee river Basins, it may also help to lower your current utility bill.

For system repairs: Contact a licensed irrigation contractor for a professional installation, particularly if the system involved additional equipment or major modifications. For a listing of qualified contractors in your area, call the Florida Irrigation Society at 1-800-441-5341 or visit their website: http://www.fisstate.org/. or refer to the yellow pages of the phone directory. For do-it-yourselfers, irrigation supplies can be obtained from home improvement centers or irrigation supply facilities.

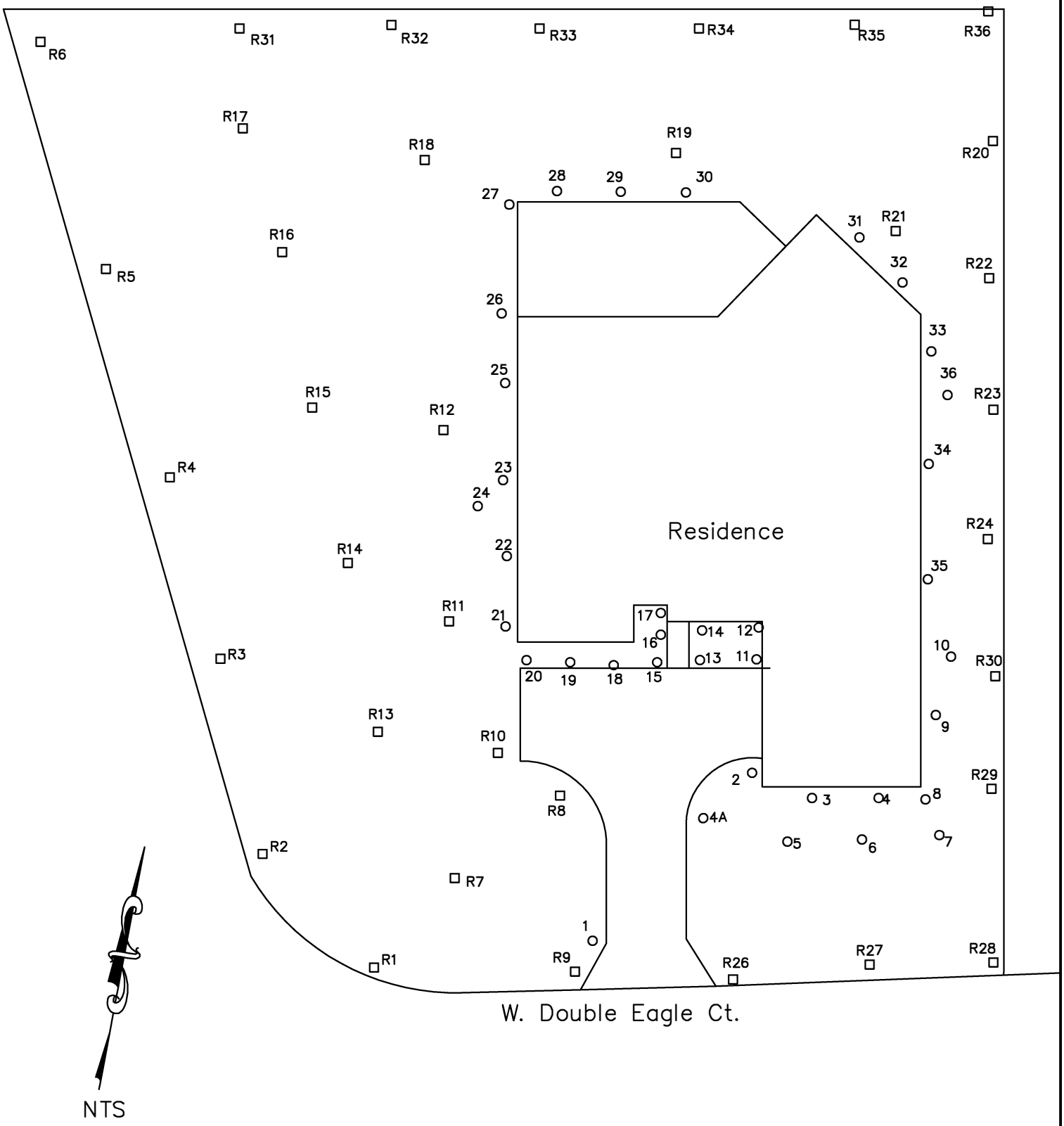
Approximately once per month inspect the irrigation system. Turn on each irrigation zone and visually examine all sprinkler heads. (Are they broken, spraying in the wrong direction or not rotating?) Take notes for later reference. Ten minutes of operation time is allowed for this inspection.

Thanks again for participating in the Withlacoochee Regional Water Supply Authority's Irrigation Evaluation program. We hope this information will benefit you. There are various recommendations and suggested changes made in this report.

Please contact WRWSA Contracted Administrator at 352-527-5795 if you have any questions or comments.

Urban runoff has been identified as the primary source of pollutant loading to surface waters in Florida and is regulated by local, state and federal regulations. Runoff in residential areas is contaminated with fertilizers, bacteria from pet waste, sediment, as well as oil and other automotive fluids from vehicles in driveways and streets. Your efforts in eliminating runoff from excessive irrigation helps reduce the amount of these pollutants which will be transported to local waters. By following the recommendations in this audit report not only will you be conserving water by irrigating more efficiently you will also be reducing your impact on the environment!

See attached Irrigation Layout Plan for irrigation equipment locations on the property.



Plan provided courtesy of the SWFWMD, Withlacoochee Regional Water Supply Authority & Citrus County

LEGEND

- ○ Location of Spray Heads
- □ Location of Rotor Head

ECO-Land Design
7615 Terrace River Drive
Tampa, FL 33637
Ph: (813) 466-8705
eco-landdesign.com

IRRIGATION LAYOUT PLAN

DATE: January 2015

APPLICANT:

Appendix C

List of Educational Materials

List of Educational Materials

(1) A Guide to the Basics of Micro-Irrigation

(2) Rain Barrels: A Homeowner's Guide

(3) Watch the Weather, Wait to Water!

(4) A Do-It-Yourself Guide to Florida Friendly Fertilizing

(5) Saving Water Outdoors

(6) Saving Water Indoors

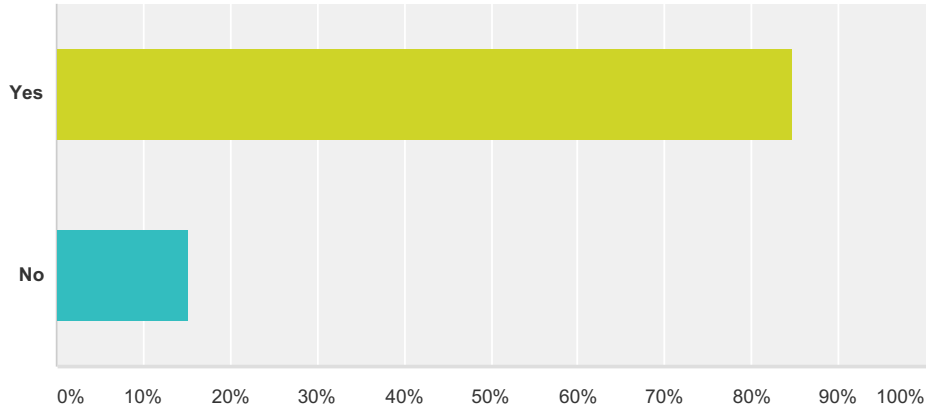
The educational materials were ordered by Jack Overdorff, the irrigation evaluation contractor, and distributed during the onsite irrigation system evaluation.

Appendix D

Customer Satisfaction Survey

Q1 Did you make any changes to your irrigation system as a result of the system evaluation?

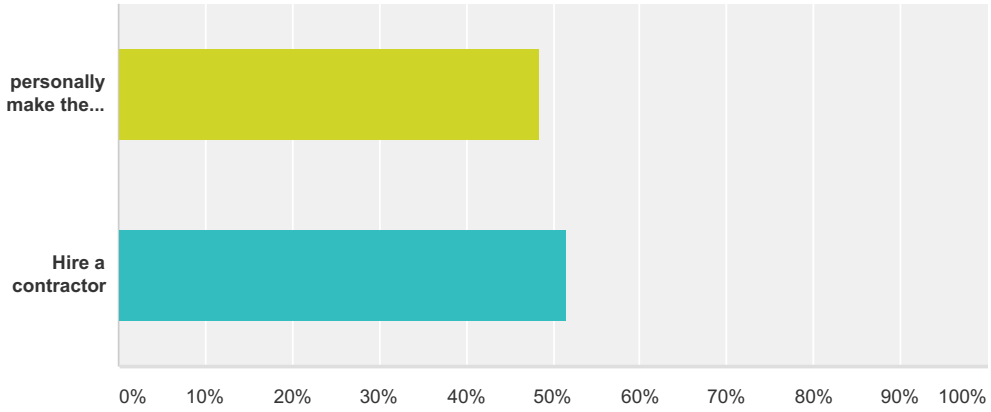
Answered: 46 Skipped: 2



Answer Choices	Responses	
Yes	**84.78%**	39
No	**15.22%**	7
Total		**46**

Q2 If you made changes to your system, did you

Answered: 31 Skipped: 17

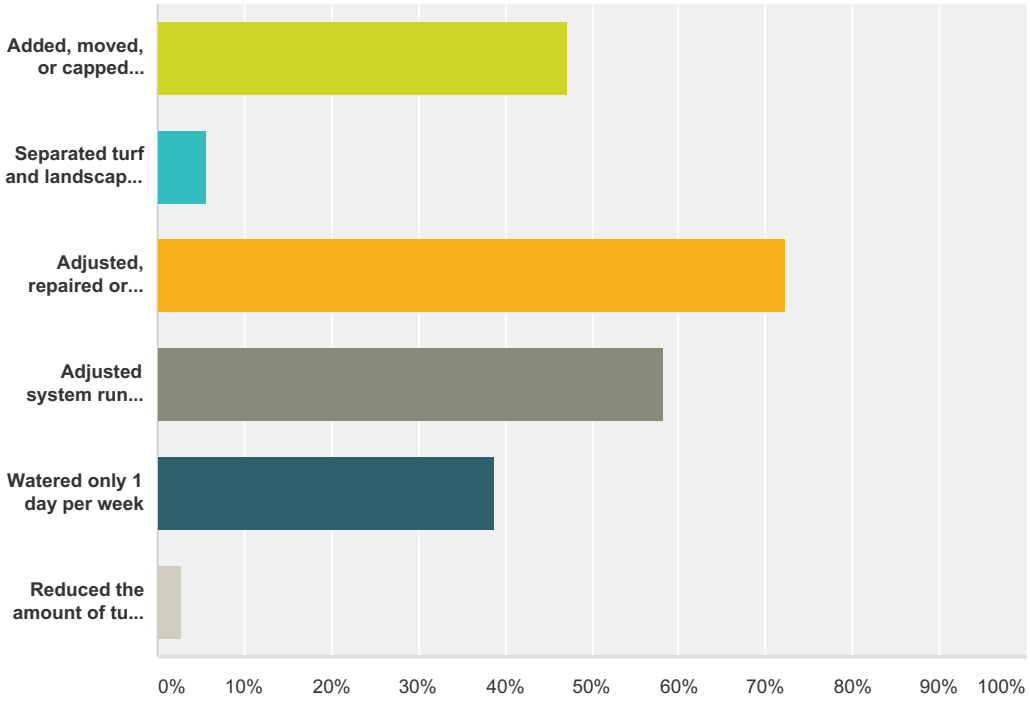


Answer Choices	Responses	
personally make the changes	**48.39%**	15
Hire a contractor	**51.61%**	16
Total		**31**

#	Other (please specify)	Date
1	Lawn maintenance man	6/30/2017 12:06 PM
2	A friend	6/28/2017 1:55 PM
3	some of both (above)	6/28/2017 1:54 PM
4	did the changes at the time of the survey.	6/23/2017 9:38 AM
5	see comments below-----person never scheduled appt to come	6/23/2017 6:20 AM
6	Does not apply	6/22/2017 3:39 PM
7	May hire as well.	6/22/2017 10:37 AM
8	May hire as well.	6/22/2017 10:25 AM

Q3 What changes did you make to your irrigation system?

Answered: 36 Skipped: 12

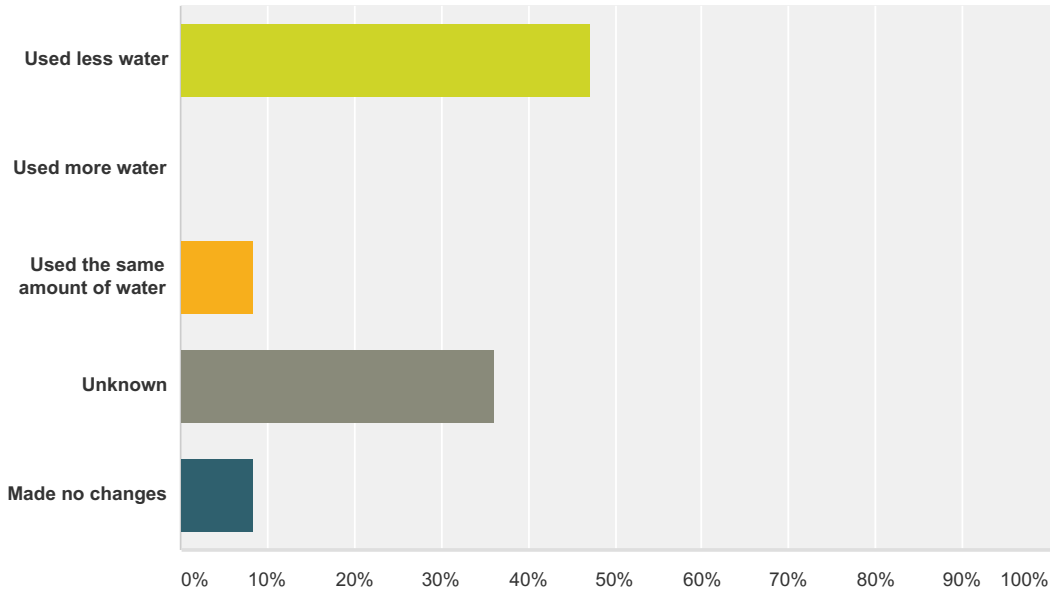


Answer Choices	Responses	
Added, moved, or capped sprinkler heads	**47.22%**	17
Separated turf and landscape zones	**5.56%**	2
Adjusted, repaired or replaced sprinkler heads	**72.22%**	26
Adjusted system run times	**58.33%**	21
Watered only 1 day per week	**38.89%**	14
Reduced the amount of turf grass	**2.78%**	1
Total Respondents: 36		

#	Other (please specify)	Date
1	Disabled heads in established foundation hedges	6/30/2017 9:31 PM
2	see comments below -- person never scheduled appt. to come	6/23/2017 6:20 AM
3	Does not apply	6/22/2017 3:39 PM

Q4 Did you notice a change in your irrigation system performance as a result of any changes made?

Answered: 36 Skipped: 12

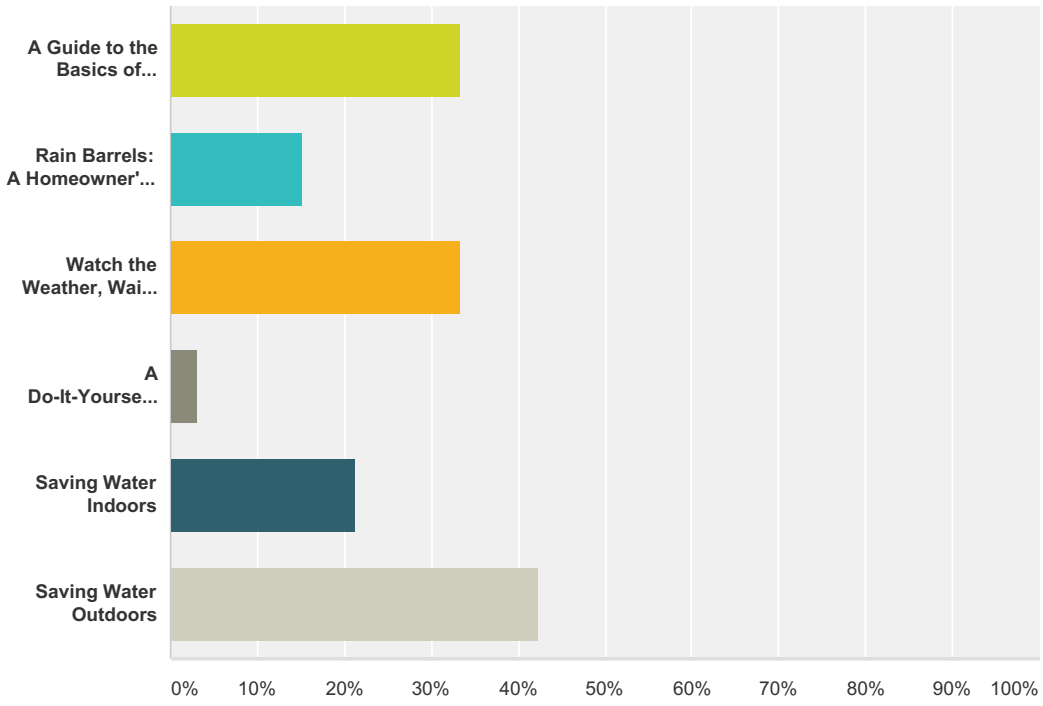


Answer Choices	Responses	
Used less water	**47.22%**	17
Used more water	**0.00%**	0
Used the same amount of water	**8.33%**	3
Unknown	**36.11%**	13
Made no changes	**8.33%**	3
Total		**36**

#	Other (please specify)	Date
1	more event distribution on lawn	6/28/2017 1:54 PM
2	see comments below -- person never scheduled appt to come.	6/23/2017 6:20 AM
3	Need to make more changes in next 45 days	6/22/2017 3:55 PM
4	Pool issues as well.	6/22/2017 10:29 AM

Q5 Which educational information provided was most helpful?

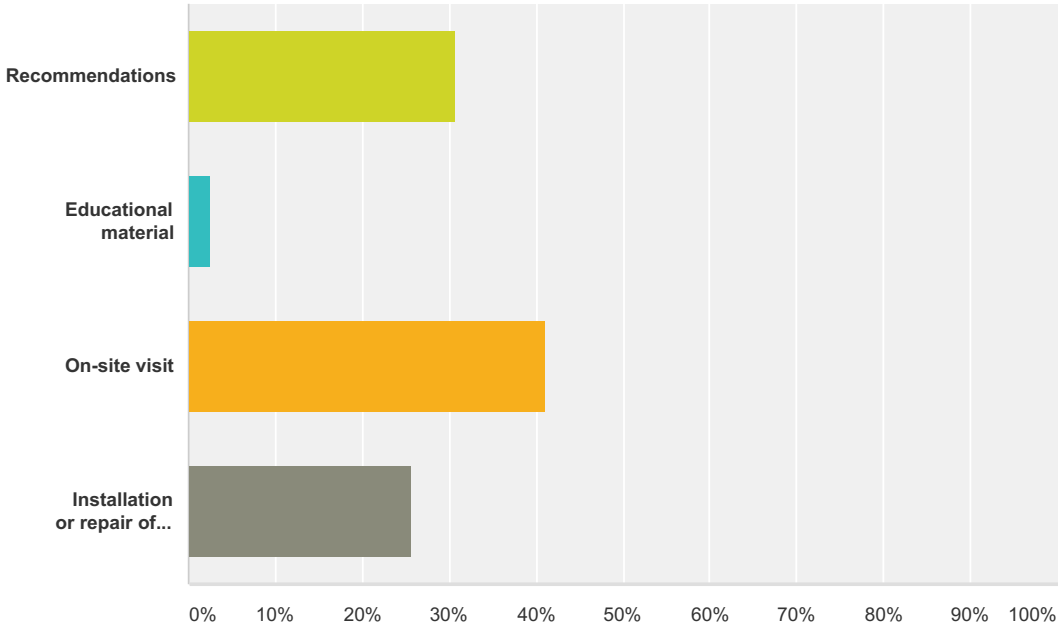
Answered: 33 Skipped: 15



Answer Choices	Responses	
A Guide to the Basics of Micro-Irrigation	**33.33%**	11
Rain Barrels: A Homeowner's Guide	**15.15%**	5
Watch the Weather, Wait to Water!	**33.33%**	11
A Do-It-Yourself Guide to Florida Friendly Fertilizing	**3.03%**	1
Saving Water Indoors	**21.21%**	7
Saving Water Outdoors	**42.42%**	14
Total Respondents: 33		

Q6 What was the most helpful part of the evaluation?

Answered: 39 Skipped: 9

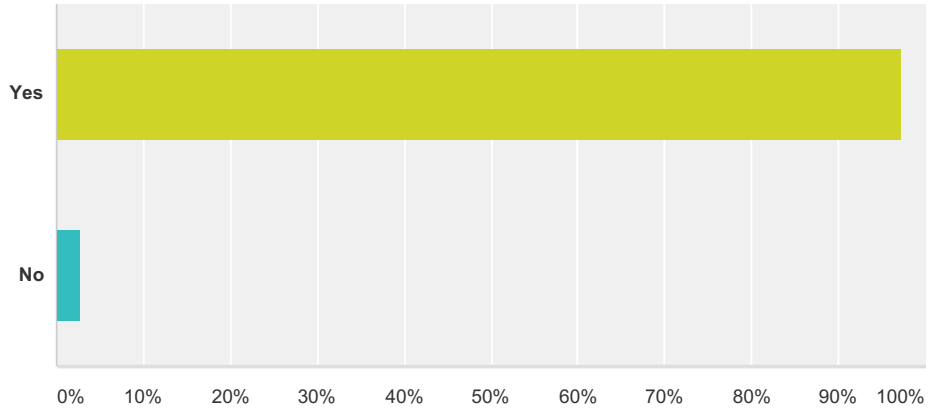


Answer Choices	Responses	
Recommendations	**30.77%**	12
Educational material	**2.56%**	1
On-site visit	**41.03%**	16
Installation or repair of rain sensor	**25.64%**	10
Total		**39**

#	Other (please specify)	Date
1	Bad recommendation for foundation hedges	6/30/2017 9:31 PM
2	see comments below -- person never scheduled appt. to come.	6/23/2017 6:20 AM
3	On-site visit helpful.	6/22/2017 10:40 AM
4	Also, the on-site visit and installation/repair of rain senor.	6/22/2017 10:37 AM

Q7 Would you recommend this program to a neighbor?

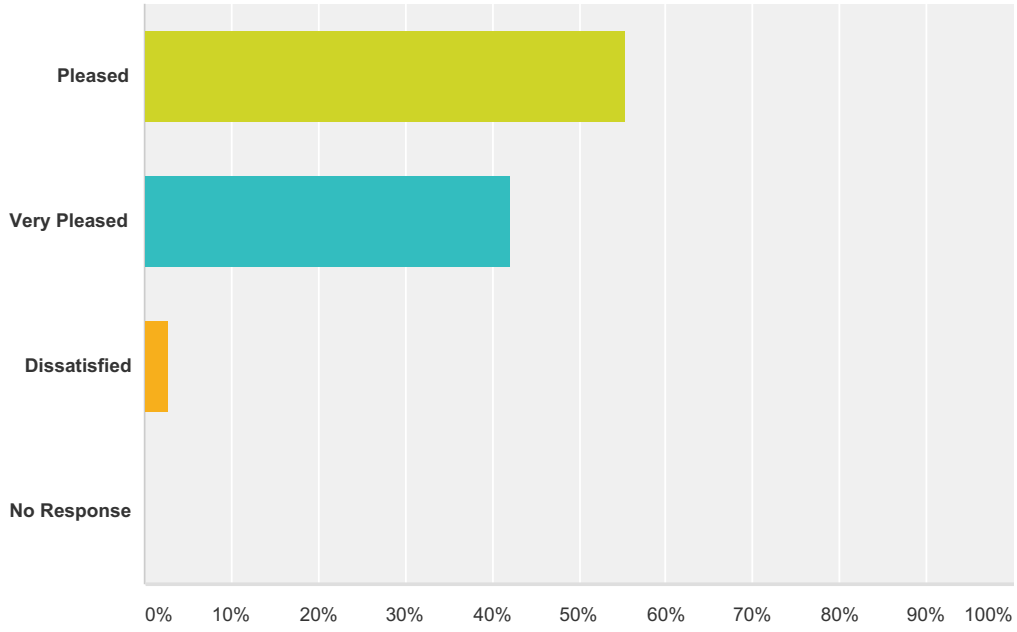
Answered: 37 Skipped: 11



Answer Choices	Responses	
Yes	**97.30%**	36
No	**2.70%**	1
Total		**37**

Q8 Overall, how would you rate the irrigation system evaluation?

Answered: 38 Skipped: 10



Answer Choices	Responses	
Pleased	**55.26%**	21
Very Pleased	**42.11%**	16
Dissatisfied	**2.63%**	1
No Response	**0.00%**	0
Total		**38**

Q9 Other Comments

Answered: 18 Skipped: 30

#	Responses	Date
1	Established foundation hedges started dying from lack of water. At first I thought it was a disease. Had to replace them.	6/30/2017 9:31 PM
2	Jack Overdorff was extremely knowledgeable -- very helpful in explaining what needed to be done to improve the system.	6/30/2017 12:07 PM
3	Program is informative and positive -- thanks.	6/30/2017 12:06 PM
4	Requested copy of "A Do-It-Yourself Guide to Florida Friendly Fertilizing"	6/30/2017 12:03 PM
5	Please be advised I have run a complete servaetor (?) to see what adjusting I can do to correct water problem. (survey not returned; comment written on letter sent to Mr. Hunter)	6/28/2017 1:59 PM
6	Had the water softener checked and found out that there was a leak from the old elements in the softener and was replaced. Leak was resolved. Leaky sprinkler heads were also replaced.	6/28/2017 1:52 PM
7	Person never came. He called to schedule when he was in the area and wanted to do it that day, and we weren't home. He said he would be back in touch, but we never heard from him again.	6/23/2017 6:20 AM
8	He did a great job my follow up was slow and work in progress. Mostly sub contract work out soon	6/22/2017 3:55 PM
9	Very professional, very thorough, very specific and very helpful; suggestions made sense.	6/22/2017 10:40 AM
10	I did hire a contractor and we got the system working as efficient as we could. I am happy with the outcome.	6/22/2017 10:34 AM
11	Jack very pleasant and nice to work with.	6/22/2017 10:29 AM
12	Jack: nice to work with a fellow person who knew West Virginia.	6/22/2017 10:27 AM
13	Did not read materials. Check forecast frequently and adjust irrigation schedule accordingly.	6/22/2017 10:25 AM
14	Mr. Overdorff's knowledge and experience was invaluable in "fine tuning" my system. The rain sensor replacement and adjustment was particularly beneficial.	6/22/2017 10:22 AM
15	The system would not let me respond to the questions. I did hire a contractor and we got the system working as efficient as we could. I am happy with the out come.	6/14/2017 1:20 PM
16	Since we can only water once a week year-round, a practice of automatically detecting and applying water to the yard is not a feasible practice. We still are limited to only a single, timed application per week.	6/14/2017 1:16 PM
17	Saved 93,000 gallons in 11 months.	6/14/2017 1:12 PM
18	Jack was very thorough and even found a leak in the system!!! That alone saved me a lot of water each month. He is professional and represents himself and your organization very well.	6/14/2017 1:07 PM

Appendix E

Water Use Data by Utility

City	ACCOUNT#	DATE EVALUATION COMPLETED AND DELIVERED	Adjusted for Partial Data				Notes
			12-Month Pre-Usage Totals	Year One 12-Month Post-Usage Totals	Change in Water Use	Percent Change in Water Use	
County (1,000's)							
Homosassa	1589194818	1/8/2015	233	286	53	23%	
Homosassa	1589363017	1/9/2015	355	359	4	1%	
Beverly Hills	1502097817	1/22/2015	132	88	-44	-33%	
Inverness	1805585708	1/22/2015	425	277	-148	-35%	
Hernando	1806626832	1/23/2015	292	475	183	63%	
Beverly Hills	1502144213	1/23/2105	469	279	-190	-41%	
Homosassa	1589528833	1/26/2015	502	357	-145	-29%	
Homosassa	1589468659	1/26/2015	307	337	30	10%	
Hernando	1804486601	1/29/2015	412	399	-13	-3%	
Hernando	1806567606	1/30/2015	410	353	-57	-14%	
Hernando	1806699615	1/31/2015	401	269	-132	-33%	
Hernando	1806649933	1/31/2015	320	303	-17	-5%	
Homosassa	1589667813	2/4/2015	364	214	-150	-41%	
Homosassa	1589903812	2/4/2015	304	330	26	9%	
Beverly Hills	1502680554	2/4/2015	291	233	-58	-20%	
Lecanto	1804517918	2/4/2015	281	448	167	59%	
Floral City	1593028028	2/9/2015	218	181	-37	-17%	
Lecanto	1804562609	2/9/2015	491	333	-158	-32%	
Citrus Springs	1501502429	2/12/2015	341	193	-148	-43%	
Citrus Springs	1501243016	2/12/2015	276	190	-86	-31%	
Homosassa	1589688611	2/20/2015	242	223	-19	-8%	
Homosassa	1589030517	2/20/2015	375	335	-40	-11%	
Hernando	1805467006	2/20/2015	393	356	-37	-9%	
Hernando	1805404702	2/20/2015	338	272	-66	-20%	
Hernando	1805019104	2/26/2015	521	317	-204	-39%	
Beverly Hills	1502389438	2/26/2015	270	252	-18	-7%	
Beverly Hills	1502622713	2/26/2015	307	299	-8	-3%	
Homosassa	1589053915	2/27/2015	402	311	-91	-23%	
Inverness	1805004908	3/3/2015	313	259	-54	-17%	
Inverness	1805395900	3/3/2015	206	160	-46	-22%	
Inverness	1805634324	3/3/2015	217	189	-28	-13%	
Hernando	1805441803	3/3/2015	389	466	77	20%	
Inverness	1805567318	3/16/2015	333	280	-53	-16%	
Lecanto	1804112512	3/16/2015	270	212	-58	-21%	
Inverness	1803004504	3/16/2015	183	237	54	30%	
Inverness	1803341211	3/16/2015	355	429	74	21%	
Hernando	1804214805	3/23/2015	297	258	-39	-13%	
Lecanto	1804441226	3/28/2015	336	326	-10	-3%	
Beverly Hills	1502334426	3/30/2015	328	294	-34	-10%	
Beverly Hills	1502217845	3/27/2015	60	25	-35	-58%	
Hernando	1806031405	4/14/2015	351	367	16	5%	
Pine Ridge	1502413816	4/16/2015	287	300	13	5%	
Hernando	1805440516	4/20/2015	344	101	-243	-71%	
Lecanto	1804399101	4/27/2015	422	423	1	0%	
Inverness	1803183316	4/30/2015	225	305	80	36%	
Pine Ridge	1502654013	8/6/2015	391	289	-102	-26%	
County Subtotal			**14,979**	**13,189**	**-1,790**	**-12%**	
		Daily	**41**	**36**	**-4.904**	**-12%**	
		Per Account	**892.14**	**785.53**	**-106.61**		
		Per Capita	**405.52**	**357.06**	**-48.46**		
ndo County							
Brooksville	RK00017	2/10/2015	217,000	199,300	-17,700	-8%	
Hernando Beach	HB01735	5/4/2015	272,500	108,300	-164,200	-60%	
Spring Hill	AV00215	5/5/2015	418,950	339,300	-79,650	-19%	Comparing 8 months of data
Spring Hill	S103010	5/23/2015	512,700	442,100	-70,600	-14%	
Brooksville	DG00710-01	5/25/2015	373,200	352,667	-20,533	-6%	Customer moved, comparing 9 months of data
Weeki Wachee	RR00379	5/25/2015	518,100	151,700	-366,400	-71%	
Spring Hill	S600953	5/28/2015	355,700	189,900	-165,800	-47%	
Spring Hill	S100761	5/28/2015	355,500	247,500	-108,000	-30%	
Spring Hill	SL00298	5/28/2015	344,900	210,800	-134,100	-39%	
Weeki Wachee	GL01321	6/2/2015	366,800	257,300	-109,500	-30%	
Spring Hill	S903763	6/2/2015	310,300	221,900	-88,400	-28%	

City	ACCOUNT#	DATE EVALUATION COMPLETED AND DELIVERED	Adjusted for Partial Data				Notes
			12-Month Pre-Usage Totals	Year One 12-Month Post-Usage Totals	Change in Water Use	Percent Change in Water Use	
Brooksville	GL00006	6/2/2015	421,500	317,200	-104,300	-25%	
Spring Hill	S910711	6/3/2015					Customer moved, less than 5 months of data
Weeki Wachee	GL01068	6/4/2015	513,600	379,000	-134,600	-26%	
Spring Hill	S911713	6/16/2015	380,600	375,700	-4,900	-1%	
Spring Hill	S604648	6/19/2015	234,600	144,700	-89,900	-38%	
Spring Hill	TP01699	7/6/2015	311,880	218,280	-93,600	-30%	Comparing 10 months of data
Weeki Wachee	GL00525	7/6/2015	573,300	353,800	-219,500	-38%	
Spring Hill	SL0027	7/13/2015	385,300	132,300	-253,000	-66%	
Spring Hill	S902671	7/13/2015	356,880	156,960	-199,920	-56%	Comparing 10 months of data
Spring Hill	S807918	7/25/2015	350,200	191,400	-158,800	-45%	
Spring Hill	TP01171	7/25/2015	98,600	157,200	58,600	59%	Comparing 6 months of data
Spring Hill	TP01577	7/28/2015	407,280	209,280	-198,000	-49%	Customer moved, comparing 5 months of data
Brooksville	VR00040	7/17/2015	329,800	142,600	-187,200	-57%	Comparing 6 months of data
Spring Hill	PP00945	7/23/2015	367,600	304,300	-63,300	-17%	
Spring Hill	S804668	7/23/2015	379,100	306,800	-72,300	-19%	
Brooksville	BK00400-05	8/1/2015	389,600	209,800	-179,800	-46%	Comparing 6 months of data
Brooksville	BK01063	8/1/2015					Suspicious data
Spring Hill	TB00168	10/23/2015	265,700	203,300	-62,400	-23%	
Spring Hill	S601477	10/23/2015	325,400	355,200	29,800	9%	
Spring Hill	RO00373	10/27/2015	315,100	237,600	-77,500	-25%	
Spring Hill	S100407	10/27/2015	299,800	78,300	-221,500	-74%	
Spring Hill	TB00901	10/30/2015	200,800	217,000	16,200	8%	
Weeki Wachee	GL00530	11/6/2015	311,500	294,700	-16,800	-5%	
Spring Hill	TP01194-02	11/6/2015	217,700	219,900	2,200	1%	
Spring Hill	TP00142	1/26/2016					Suspicious data
Weeki Wachee	GL01168	3/11/2016	384,400	276,600	-107,800	-28%	
Weeki Wachee	GL01328	4/6/2016	324,200	266,300	-57,900	-18%	
Spring Hill	RO00551-01	4/6/2016	333,000	388,700	55,700	17%	
Weeki Wachee	GL02191	4/12/2016	511,200	252,000	-259,200	-51%	Customer moved 01/16, comparing 6 months of data
Weeki Wachee	GL01364	4/12/2016	331,091	333,600	2,509	1%	Comparing 11 months of data
Weeki Wachee	GL01208-02	4/14/2016	295,800	325,100	29,300	10%	
Weeki Wachee	GL01200	4/15/2016	286,100	318,300	32,200	11%	
ndo County Subtotal			**13,947,281**	**10,086,687**	**-3,860,594**	**-28%**	
			13,947	**10,087**	**-3,861**	**-28%**	
		Daily	**38**	**28**	**-10.577**	**-28%**	
		Per Account	**909.80**	**657.97**	**-251.83**		
		Per Capita	**434.22**	**314.03**	**-120.19**		
n County (1,000's)							
Ocala	033074-00	4/3/2015	157	123	-35	-22%	9 months of data
Ocala	033068-00	4/6/2015	299	219	-80	-27%	9 months of data
Ocala	023942-00	4/6/2015	204	131	-73	-36%	
Ocala	032631-00	4/6/2015	321	285	-36	-11%	9 months of data
Ocala	009686-01	4/17/2015	263	169	-94	-36%	
Ocala	031620-01	4/17/2015	415	231	-184	-44%	
Ocala	006079-00	6/4/2015					sold, delete from data
Ocala	005875-01	6/4/2015	351	349	-2	-1%	sold
Ocala	005880-04	7/28/2015					sold, delete from data
Ocala	030952-01	7/28/2015	361	255	-106	-29%	
Ocala	030954-01	9/1/2015	877	1,766	889	101%	
Ocala	032169-00	9/11/2015	329	195	-135	-41%	9 months of data
Ocala	010721-00	9/18/2015	271	164	-107	-39%	
Ocala	023076-00	9/18/2015	217	110	-107	-49%	
Ocala	010499-00	9/25/2015	248	141	-107	-43%	
Ocala	009543-01	9/25/2015	273	194	-79	-29%	7 months of data
Ocala	010781-01	9/28/2015	314	74	-240	-76%	6 months of data
Ocala	008928-00	9/28/2015	272	278	6	2%	
Ocala	032874-00	9/30/2015	283	253	-30	-11%	
Ocala	032960-00	9/30/2015	181	134	-47	-26%	
Ocala	006816-00	10/2/2015	267	379	112	42%	
Ocala	032583-00	10/2/2015	559	370	-189	-34%	
Ocala	032107-00	10/5/2015	220	490	270	123%	
Ocala	009987-00	10/5/2015	239	199	-40	-17%	

City	ACCOUNT#	DATE EVALUATION COMPLETED AND DELIVERED	Adjusted for Partial Data				Notes
			12-Month Pre-Usage Totals	Year One 12-Month Post-Usage Totals	Change in Water Use	Percent Change in Water Use	
Ocala	009892-00	10/5/2015	280	337	57	20%	
Ocala	011211-00	10/6/2015	265	238	-27	-10%	
Ocala	011448-00	10/8/2015	220	178	-42	-19%	
Ocala	032104-00	10/8/2015	209	222	13	6%	
Ocala	032834-00	10/12/2015	243	66	-177	-73%	
Ocala	010335-01	10/12/2015	204	289	85	42%	
Ocala	007448-00	10/14/2015	130	144	14	11%	
Ocala	028053-02	10/14/2015	302	399	97	32%	
Ocala	007603-03	10/20/2015	325	200	-125	-38%	sold
Ocala	013849-00	10/20/2015	264	211	-53	-20%	
Ocala	013849-00	10/21/2015	267	164	-103	-39%	
Ocala	007426-00	10/21/2015	357	211	-146	-41%	
Ocala	007492-01	10/28/2015	234	168	-66	-28%	
Ocala	033143-00	10/28/2015	243	288	45	19%	
Dunellon	018614-01	11/2/2015	213	173	-39	-19%	7 months of data
Ocala	031703-01	11/2/2015	177	139	-38	-21%	
Ocala	006807-01	12/1/2015	235	214	-21	-9%	
Ocala	005861-02	12/2/2015	451	276	-175	-39%	
Ocala	006148-01	12/2/2015	224	151	-73	-33%	sold, 10 months of data
Ocala	031746-01	12/7/2015	539	465	-74	-14%	
Ocala	005867-01	12/11/2015	818	627	-190	-23%	sold, 7 months of data
Ocala	032193-00	4/8/2016	283	312	29	10%	
Ocala	012095-00	4/8/2016	291	241	-50	-17%	
Ocala	010249-02	4/13/2016	359	249	-110	-31%	
Ocala	006204-00	4/13/2016	330	244	-86	-26%	
Ocala	014002-00	4/15/2016	243	212	-31	-13%	
Ocala	033113-00	4/15/2016	358	347	-11	-3%	
h County Subtotals			**14,985**	**13,274**	**-1,711**	**-11%**	
		Daily	**41**	**36**	**-4.688**	**-11%**	
		Per Account	**837.85**	**742.18**	**-95.67**		
		Per Capita	**380.84**	**337.35**	**-43.49**		
ram Total			**43,911**	**36,550**	**-7,362**	**-17%**	
		Daily	**120**	**100**	**-20.169**	**-17%**	

Appendix F

Summary of Follow-ups

Appendix E. Phase 3 N640 Follow-up Summary

County	Customer Number	Percent Implementation	Estimate of Existing Water Use (Gal/Year)	Estimate of Post Evaluation Water Use (Gal/Year)	Projected Annual Gallons Saved	Percent Saved
Citrus						
	1	40	654,160	476,320	177,840	27.2%
	2	50	491,920	429,486	62,434	12.7%
	3	60	286,260	270,400	15,860	5.5%
	4	40	330,720	248,040	82,680	25.0%
	5	50	370,240	260,000	110,240	29.8%
	6	30	754,000	235,560	518,440	68.8%
	7	70	358,800	382,200	-23,400	-6.5%
	8	50	178,880	218,400	-39,520	-22.1%
	9	80	196,820	272,272	-75,452	-38.3%
	10	40	553,280	594,880	-41,600	-7.5%
	11	10	387,400	450,216	-62,816	-16.2%
		47	4,562,480	3,837,774	724,706	15.9%
Hernando						
	1	40	236,392	255,788	-19,396	-8.2%
	2	50	245,024	217,256	27,768	11.3%
	3	30	303,472	298,480	4,992	1.6%
	4	40	282,776	260,832	21,944	7.8%
	5	10	298,896	198,328	100,568	33.6%
	6	90	361,088	341,380	19,708	5.5%
	7	50	291,720	238,160	53,560	18.4%
	8	10	465,920	472,472	-6,552	-1.4%
	9	10	124,488	98,592	25,896	20.8%
	10	50	538,356	74,932	463,424	86.1%
	11	20	82,316	101,972	-19,656	-23.9%
		36	3,230,448	2,558,192	672,256	20.8%
Marion						
	1	60	168,584	114,088	54,496	32.3%
	2	90	232,440	276,328	-43,888	-18.9%
	3	95	236,288	118,612	117,676	49.8%
	4	40	278,200	257,088	21,112	7.6%
	5	70	161,928	133,120	28,808	17.8%
	6	10	246,480	98,800	147,680	59.9%
	7	20	238,680	130,832	107,848	45.2%
	8	50	763,048	116,896	646,152	84.7%
	9	20	248,664	148,928	99,736	40.1%
	10	50	826,020	334,620	491,400	59.5%

	11	90	139,932	116,688	23,244	16.6%
	12	70	137,280	146,432	-9,152	-6.7%
	13	80	441,896	173,576	268,320	60.7%
		57	4,119,440	2,166,008	1,953,432	47.4%
		48	11,912,368	8,561,974	3,350,394	28.1%