Regional Irrigation System Evaluation Program
Phase IV Final Report
2016 – 2019

A Cooperative Funding Initiative
(N822)

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Prepared by
Withlacoochee Regional Water Supply Authority

WITHLACOOCHEE REGIONAL
WATER SUPPLY AUTHORITY

Southwest Florida
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Acknowledgements Page

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Irrigation System Audit and Education Phase III Project (N-640)

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Withlacoochee Regional Water Supply Authority
Irrigation System Evaluation and Education Program Phase IV (N822)
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 or SWFWMD) 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, as well as the North Sumter County Utility Dependent District (NSCUDD) and the Villages Community Center Development District (VCCDD) participated in the program. The utilities identified those single-family residential customers with the highest water use 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. In numerous cases the Authority's contractor, at the direction of the participating local utility, completed "Enhanced" evaluations.

2. Program Description

This project targeted existing high usage, fully operational single-family residential irrigation systems to increase water savings and water quality protection.

Participating utilities had the option of having "Core" or "Enhanced" evaluations performed. Core evaluations 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, recommendations for optimizing the use of water outdoors through Florida-Friendly Landscaping™ practices, and other efficient irrigation best management practices. 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).

Enhanced evaluations involved not only the core services described above, but in some cases installation of an advanced Water Sense labeled evapotranspiration (ET) controller and/or ET sensor device (instead of a standard rain sensor) and performing some or all of the irrigation system modifications that were recommended. The Enhanced audits also included, where

appropriate, performing catch-can audits by zone, adjusting the irrigation controller based on the catch-can test, replacing broken or mixed sprinkler heads, capping unnecessary heads, raising low irrigation heads, and straightening crooked irrigation.

Approximately one year after the initial evaluation, a sample of 25% of the participants were offered a follow-up inspection. For core evaluations, the reinspection determined how many changes were made by the homeowner. The contractor provided an estimate of changes made based on the original recommendations. For enhanced evaluations, the reinspection evaluated subsequent changes by the homeowner and recommendations not implemented by the contractor during the original evaluation. 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 can comprise 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 Phase IV Project Plan called for 320 core and 96 enhanced evaluations to be conducted, for a total of 416, with approximately 25% or 104 receiving a follow-up inspection. The actual results were 131 core evaluations, 190 enhanced evaluations, for a total of 321, with 82 follow-ups. These results are further explained below.

2.2 Methodology

The Phase IV program consisted of four major components:

a. Onsite investigations: 131 core irrigation evaluations and 190 enhanced evaluations;
b. Follow-up evaluations for up to 25 percent (82 participants) of the 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 February 21, 2017. The following paragraphs describe the implementation of the Phase IV 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 September 2016 in anticipation of entering into the Cooperative Funding Agreement with the District. 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 IV evaluations began in December 2016.

Process. Each participating utility, including Citrus, Hernando and Marion county utilities, the VCCDD and NSCUDD 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 to target the highest water users in each utility. In Marion County, only single-family residential customers located in the SWFWMD, or west of Interstate 75, were eligible to participate since the District was co-funding the program and required participants to be located within the District's boundaries. 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, as well as their average monthly water use and the water rates for that utility. The Authority created mail merge files specific to each utility, including potential savings in dollars per month for each customer by participation in the program. Invitation letters, associated application forms, a program description and a postage paid return envelope were mailed by the Authority (see Appendix A for sample materials). Initial response rates to these mailings ranged from a low of 16% in Marion County to a high of 66% in the VCCDD. Additional mailings to the highest use single-family residential customers who had not yet participated in the program were conducted during the project to garner sufficient participation.

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 IV 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 December 2, 2016. The on-site portion of the program extended through September 28, 2018 lasting a total of 22 months. A total of 321 irrigation system evaluations were completed within the five utilities out of a program goal of 416, or 77 percent. Table 3.1 summarizes the irrigation system evaluations completed by participating utility. Citrus, Hernando and Marion county utilities elected to have both core and enhanced audits conducted. As the project progressed, significantly more audits were performed as enhanced audits and fewer as core audits within these counties than was originally planned. In the VCCDD and NSCUDD only core audits were budgeted and performed.

Table 3.1 Irrigation System Evaluation Summary

Participating Utility	Core Audits		Enhanced Audits		Total Audits	
	Target Number of Evaluations	Completed Evaluations	Target Number of Evaluations	Completed Evaluations	Target Number of Evaluations	Completed Evaluations
Citrus	40	16	20	42	60	58
Hernando	58	2	31	64	89	66
Marion	90	7	45	59	135	66
VCCDD (LSSA)	44	43	0	0	44	43
NSCUDD (VWCA)	88	88	0	0	88	88
Total	320	156	96	165	416	321

3.2 Rain Sensors Installed

A total of 269 rain sensors were installed. Eighty-four 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 Rain Sensor Installation per Utility

Utility	Total Evaluations	Sensors Installed or Repaired		Functional Sensors	
		Number	Percent	Number	Percent
Citrus	58	53	91.4%	5	8.6%
Hernando	66	58	87.9%	8	12.1%
Marion	66	57	86.4%	9	13.6%
VCCDD	43	37	86.0%	6	14.0%
NSCUDD	88	64	72.7%	24	27.3%
Totals	**321**	**269**	**83.8%**	**52**	**16.2%**

3.3 Follow-up Evaluations

The 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. This 25% target was applied at the utility level, resulting in a total of 82 follow-up evaluations. 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 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 September 2019.

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

Table 3.3 Follow-up Evaluations by Utility

Utility	Number of Evaluations Completed	Target Number of Follow-Ups Based on Evaluations Completed	Actual Follow-Ups
Citrus	58	15	15
Hernando	66	17	17
Marion	66	17	17
VCCDD	43	11	11
NSCUDD	88	22	22
Totals	**321**	**82**	**82**

3.4. Total Water Savings

For this Phase IV program, 321 single-family residential irrigation systems were evaluated. For each of these participants, monthly water use data was collected by the utility for one year prior to the month in which the evaluation was performed and one year after the evaluation. This data is shown in Appendix E. These data show a number of participants had zero or near zero values for one or more months. These zero or near zero values were sometimes associated with a customer moving or having their water turned off while away. In addition, a few customers installed irrigation wells during the period that impacted five or more months during the study period. Since the purpose of the pre- and post-audit water use analysis is to evaluate the impact the audit and associated educational program have had on the customer's water use, the monthly water use of some customers was adjusted to reflect these other factors that would otherwise distort the analysis.

Accounts with 6 months or more of zero or near zero monthly water use values in either the pre- or post-evaluation period were excluded from the analysis. For those accounts with five months or less of missing, zero or near zero monthly values in either the pre- or post-evaluation period, the missing or low monthly values were adjusted. These data were adjusted by calculating the average of the remaining monthly values within the pre- or post-evaluation period and applying that average to the missing, zero or near zero monthly values. In addition, several customers had one or more months of abnormally high water use that was determined to be caused by the installation of new sod. These customers' water use was adjusted in a similar manner whereby the average monthly value of the remaining months in that period was applied to that month(s) of abnormal high use. Both the unadjusted and adjusted data are shown in Appendix E.

One exception to this adjustment process is in Marion County, where utility staff stated that zero values for a period of just one month are typically associated with when the account meter was read. So, if a meter is not read in one month, but read at the beginning of the subsequent month, that prior month's water use is being captured in the subsequent month's data.

A total of eight customers were removed from the analysis, leaving 313 customers for analysis. Thirty-seven customers' water use data were adjusted. There is only a minor change in the overall program results when the unadjusted and adjusted data are compared in terms of total water saved or percent savings.

Table 3.4 shows total amount of water used in the pre-evaluation and post-evaluation periods by these accounts and the water saved. The data is shown first for core audits and then enhanced audits that did not include a Water Sense controller, enhanced audits that did include a Water Sense controller, and finally for the total program. All enhanced evaluations included replacing broken or mixed sprinkler heads, capping unnecessary heads, raising low irrigation heads, and straightening crooked irrigation heads where appropriate. Additionally, some enhanced evaluations further received a Water Sense labeled controller upgrade. When possible, the controller upgrade meant adding a Water Sense labeled component, such as weather station to an existing controller. In other cases, the entire controller was replaced with a Water Sense labeled fixture. In Citrus, Hernando and Marion counties, core and enhanced evaluations were performed. In the VCCDD and NSCUDD only core evaluations were performed. Water savings for the 152 core evaluations was approximately 10 million gallons for the year, or 22.7%. This represents 27,401 gallons per day and 180 gallons per account per day. Water savings for the 123 enhanced evaluations that did not include a Water Sense controller was approximately 9.8 million gallons for the year, or 27%. This represents 26,743 gallons per day and 217 gallons per account per day. Water savings for the 38 enhanced evaluations that included a Water Sense controller was approximately 6.2 million gallons for the year, or 41%. This represents 16,979 gallons per day and 447 gallons per account per day. Total annual water savings for all 313 accounts was approximately 26 million gallons, or 71,123 gallons of water per day and 227 gallons per account per day, representing a 27% reduction in water use.

Table 3.4 Water Savings by Utility

Utility	*Evaluations with Pre/Post Use*	*One Year Pre-Evaluation Water Use (in millions of gallons)*	*One Year Post-Evaluation Water Use (in millions of gallons)*	*Water Saved (in millions of gallons)*	*Percent Water Saved*	*Gallons Per Day Saved*	*Gallons Per Account Per Day Saved*
Core Evaluations:							
Citrus	16	5.649	4.162	1.487	26.3%	4,074	255
Hernando	2	0.591	0.441	0.150	25.4%	410	205
Marion	7	1.266	1.336	-0.070	-5.53%	-192	-27
VCCDD	41	12.781	10.051	2.730	21.36%	7,479	182
NSCUDD	86	23.718	18.013	5.705	24.1%	15,630	182
Subtotal	152	44.004	34.003	10.001	22.7%	27,401	180
Enhanced Evaluations without Water Sense Controller:							
Citrus	22	10.448	6.599	3.850	36.8%	10,547	479
Hernando	46	15.270	11.167	4.102	26.9%	11,239	244
Marion	55	9.939	8.130	1.809	18.2%	4,957	90
Subtotal	123	35.657	25.896	9.761	27.4%	26,743	217
Enhanced Evaluations with Water Sense Controller:							
Citrus	17	8.423	4.311	4.112	48.8%	11,265	663
Hernando	18	6.164	4.111	2.053	33.3%	5,623	312
Marion	3	0.596	0.563	0.033	5.5%	90	30
Subtotal	38	15.183	8.985	6.197	40.8%	16,979	447
Enhanced Evaluations Subtotal:							
Citrus	39	18.871	10.910	7.962	42.2%	21,812	559
Hernando	64	21.434	15.279	6.155	28.7%	16,863	263
Marion	58	10.535	8.693	1.842	17.5%	5,047	87
Subtotal	161	50.840	34.881	15.959	31.4%	43,722	272
Core and Enhanced Evaluations Total:							
Citrus	55	24.520	15.072	9.449	38.5%	25,886	471
Hernando	66	22.024	15.720	6.305	28.6%	17,273	262
Marion	65	11.801	10.029	1.772	15.0%	4,855	75
VCCDD	41	12.781	10.051	2.730	21.4%	7,479	182
NSCUDD	86	23.718	18.013	5.705	24.1%	15,630	182
Total	313	94.844	68.884	25.960	27.4%	71,123	227

Comparing the core and enhanced evaluations average results, the enhanced evaluations saved 92 gallons more per account per day than the core evaluations (272 - 180). This represents an approximate 51% greater savings for the enhanced over the core evaluations. The increased savings of the enhanced evaluations over the core evaluations is likely attributable to the contractor implementing many if not all of the system modifications that were developed as a part of the evaluation. The District calculated cost effectiveness of the core audits is $1.65 $/Kgal, while enhanced audit calculations come in at $1.37 $/Kgal. Therefore, the enhanced audits appear to be worth the extra financial investment and provide a greater impact than core audits for each dollar spent.

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 for the four-county region (Marion County only within the SWFWMD) and are summarized in Table 3.5.

As can be seen, there is more rainfall in the post-audit period when compared to the pre-audit period. This would tend to cause outdoor water use to decrease, so some of the reduction seen in the pre- post-audit analysis may be attributable to this increase in rainfall. 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

Time Periods	Cumulative Rainfall
Pre: December 2015 – August 2018	149.33
Post: December 2016 – August 2019	163.49
Difference	14.15

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 program resulted in an overall savings of 106 gallons per person per day, a 27% reduction in per capita water use. The core evaluations resulted in an average reduction of 92 gallons per capita per day, or 23%. The enhanced evaluations resulted in an average reduction of 117 gallons per capita per day, or 31%.

Table 3.6 Water Saved Per Capita

Utilities	Number of Accounts	Persons Per Household [1]	Pre-Evaluation Per Capita Use	Post-Evaluation Per Capita Use	Water Saved Per Capita Per Day	Per Capita % Reduction
Core Evaluations						
Citrus County	16	2.2	440	324	116	26%
Hernando County	2	2.38	340	254	86	25%
Marion County	7	2.35	211	223	-12	-6%
VCCDD	41	1.9	449	353	96	21%
NSCUDD	86	1.9	398	302	96	24%
Subtotal	152		405	313	92	23%
Enhanced Evaluations						
Citrus County	39	2.2	603	348	254	42%
Hernando County	64	2.38	386	275	111	29%
Marion County	58	2.35	212	175	37	17%
Subtotal	161		372	255	117	31%
Total	313		387	281	106	27%

[1] For Citrus, Hernando and Marion counties, 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. For VCCDD and NSCUDD provided by Arnett Environmental, 2019.

3.6 Program Costs

The total program costs were budgeted for $200,000 pursuant to the Agreement. Total program expenditures were $152,919 or 76.5 percent of the original budget. The on-site evaluation expenses averaged $265 per core evaluation with a total cost of $34,703 and $480 per enhanced evaluation with a total cost of $91,233, for a combined cost of $125,936. The evaluation costs include costs associated with replacement of rain sensors when necessary. The project included an administrative fee at $50 per evaluation, for a total cost of $16,050. Marketing and outreach costs were $2,733. The cost for the follow-up inspections was $8,200. Pursuant to the District's methodology for estimating cost per thousand gallons saved, the project resulted in $1.47 per 1,000 gallons of water saved.

Pursuant to the Agreement, the District provided 50 percent of the total funding, not to exceed $100,000. 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. In addition, the participating utilities provided critical support by identifying high water users as potential participants, contacting customers, assisting with analyzing the data.

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 $38,230.

Table 3.7 Expenditures Per Utility

Irrigation Evaluation Program Costs								
		WRWSA						
Item	SWFWMD	Citrus	Hernando	Marion	VCCDD	NSCUDD	Subtotal	Total
Irrigation Evaluations	$62,968	$15,369	$17,804	$12,443	$5,614	$11,737	$62,968	$125,936
Administration	$8,025	$1,450	$1,650	$1,650	$1,075	$2,200	$8,025	$16,050
Marketing	$1,367	$247	$252	$428	$145	$294	$1,367	$2,733
Follow-up Inspections	$4,100	$750	$850	$850	$550	$1,100	$4,100	$8,200
Total	$76,460	$17,815	$20,557	$15,372	$7,384	$15,331	$76,460	$152,919
Final County Cost		$8,908	$10,278	$7,686	$3,692	$7,666	$38,230	

Table 3.8 shows the total cost by utility summarized for enhanced and core audits. The average cost for a core audit was $380, while the average cost for an enhanced audit was $589. Enhanced audits cost on average $209, or 55%, more than core audits.

Table 3.8 Costs for Enhanced and Core Audits

	Number of Audits	Total Cost	Audit Cost Only / Audit	Total Cost / Audit
Core Costs				
Citrus	33	$17,109.43	$434.10	$518.47
Hernando	2	$671.79	$252.49	$335.90
Marion	7	$2,533.53	$273.20	$361.93
VCCDD (LSSA)	43	$14,768.97	$261.14	$343.46
NSCUDD (VWCA)	88	$30,662.62	$266.75	$348.44
Total	173	$65,746.34	$297.37	$380.04
Enhanced Costs				
Citrus	25	$18,521.51	$656.50	$740.86
Hernando	64	$40,441.62	$548.50	$631.90
Marion	59	$28,210.00	$389.40	$478.14
VCCDD (LSSA)	0	$0.00		
NSCUDD (VWCA)	0	$0.00		
Total	148	$87,173.13	$503.32	$589.01
Combined Costs				
Citrus	58	$35,630.94	$529.96	$614.33
Hernando	66	$41,113.41	$539.53	$622.93
Marion	66	$30,743.53	$377.08	$465.81
VCCDD (LSSA)	43	$14,768.97	$261.14	$343.46
NSCUDD (VWCA)	88	$30,662.62	$266.75	$348.44
Total	321	$152,919.47	$392.32	$476.38

4. Customer Implementation

The program included the Authority's contractor revisiting approximately 25 percent of each utility's participating customers to inspect how recommendations have been implemented and other changes the homeowners may have made to their irrigation systems since the evaluation was performed. 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 and its recommendations, 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 enhanced, core and all follow-ups. Appendix F summarizes the follow-up inspections.

Table 4.1 Summary of Follow-up Findings

	Number of Follow-Up Inspections			Percent of Changes Implemented		
Utility	**Core**	**Enhanced**	**Total**	**Core**	**Enhanced**	**Total**
Citrus	9	6	15	73.3%	72.5%	73.0%
Hernando	0	17	17		78.2%	78.2%
Marion	3	14	17	56.7%	82.9%	78.2%
VCCDD (LSSA)	11	0	11	71.8%		71.8%
NSCUDD (VWCA)	22	0	22	70.0%		70.0%
Total	45	37	82	70.2%	79.1%	74.2%

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 100 percent. The overall program implementation rate was 74.2%.

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 51 responses were received. Respondents to the survey included customers who received either a core or enhanced irrigation system evaluation.

Eighty-four percent of respondents reported making at least some changes to their irrigation systems. Forty percent reported adjusting, repairing or replacing irrigation heads, followed by adjustments to irrigation system run times (31%). Forty-three 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, 92 percent selected “Pleased” or “Very Pleased” with the irrigation system evaluation.

5. Recommendations

It is recommended that this Irrigation System Audit program be continued for additional phases. The Phase 4 results show a positive outcome for both core and enhanced audits. This was the first time enhanced audits have been offered in the program and the results are positive. Core audits saved on average 92 gallons per person per day, a 23% reduction. Enhanced audits saved on average 117 gallons per person per day, a 31% reduction. The District calculated cost effectiveness of the core audits is $1.65 $/Kgal, while enhanced audit calculations come in at $1.37 $/Kgal. Therefore, the enhanced audits appear to be worth the extra financial investment and provide a greater impact than core audits for each dollar spent. Enhanced audits should continue to be offered as an option in future phases of the program.

To potentially increase customer participation, consideration should be given to sending follow-up letters to customers who have been invited to participate but who have not responded.

In addition, ways by which more audits can be conducted during the limited “snow-bird” season, when more people are in state and available to be home for an audit to be conducted, should be investigated. Training of contractors so more qualified contractors are available to perform the work should be considered as well.

Appendices

A. Marketing Materials

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Appendix A

Marketing Materials

(Municipality Logo)

(Date)

(Name)
(Address)
(City/State/Zip)

Subject: Potential Water Bill Savings

Dear (Name),

We noticed your water usage has averaged about __,000 **gallons per month** at your home located at (Address) in (Municipality), Florida. This usage is higher than the average user. The average residential customer of the _____ Utilities Department is between 8,000-10,000 gallons per month, which includes both indoor and outdoor water consumption. So, we are trying to find ways to help you reduce your water use.

Based on past performance, I believe our Irrigation Evaluation program could reduce your water use by 20% or more. Using Hernando County Utilities 2018 water rates that went into effect this October, I estimate participation in this program could save you an average of **$__** a month! There are other things Hernando County does to help customers save water, but I think the Irrigation Evaluation program will offer the greatest savings – and, it's **FREE** to you. See the enclosed brochure which further describes our program.

If you choose to participate, our contractor will run each of your irrigation system zones to identify ways to improve water efficiency, create a map of the irrigation system for you to keep, and provide written recommendations of improvements. With your permission, he can even do some minor fixes and adjustments at no cost to you. All you must do is complete the enclosed application and return it to:

LuAnne Stout, Administrative Assistant
Withlacoochee Regional Water Supply Authority
3600 W Sovereign Path, Suite 228
Lecanto, FL 34461

The contractor will contact you to schedule a convenient time to visit your home. This is a by 'invitation only' offer available on a first-come, first-served basis. Space is limited. I hope you will consider participating. If you have any questions, please give me a call. I look forward to working with you.

Sincerely,

(Municipality Coordinator)

Enclosures

Irrigation Evaluation Program (N822) Application Form

Residential Water Customer Information:

Complete Name:	Account Number:	Day-Time Telephone Number: Best Time to Call:
Street Address with Zip Code:	Email Address:	
Does your water account serve more than one home? _____No _____Yes If Yes, how many?_____		
Is your irrigation system operational and without any known or major breaks, leaks or other damage? _____Yes _____No **If the system is not functioning, the irrigation system must be repaired before an evaluation can be scheduled.**	Do you have a rain sensor installed on your automatic in-ground sprinkler system? _____Yes _____No _____Don't Know	
Please indicate the number of zones your sprinkler system contains: 1 - 4 zones _____ 5 - 8 zones _____ More than 8 zones _____ Don't know_____		

(Please Turn Page Over for Program Guidelines)

By signing below, I certify that I have read and will abide by the program guidelines as outlined. IN ADDITION, I certify that my entire irrigation system is in good operating condition. In the event my irrigation system or major parts of my irrigation system are inoperable when the System Evaluator arrives to conduct the irrigation system evaluation, I understand that I will be ineligible to receive the requested evaluation.

_____ _____

Signature Name (Please Print)

_____

Date

This program is cooperatively funded by the Withlacoochee Regional Water Supply Authority, participating local governments, and the Southwest Florida Water Management District.

- **This program applies only to single-family residential users using public-supply, metered water for their operable in-ground irrigation or sprinkler system.**

How to Participate:

1. Complete and sign this application form.

2. Return the application in the stamped, self-addressed envelope that is included with this application; OR, if filling out the online form, return to: lstout@wrwsa.org

3. The Program's contractor will contact you to arrange an appointment to perform an evaluation of your irrigation system. You will need to provide access to your property and your sprinkler system's time clock.

What to Expect from the Irrigation Evaluation Program:

1. ***At no cost to you***, an irrigation system evaluation, including suggested changes to improve the operation and efficiency of your irrigation system**.**
2. Installation of a rain sensor where a rain sensor is not present or is inoperable. Acceptance of a functioning rain sensor is a requirement to participate in this program. ***There is no cost to you.***
3. Educational materials on water conservation, ***at no cost to you*.**
4. Reduction in water use and lower water bills.
5. Possible improvement in the health and appearance of your lawn and landscape over time.

Program Terms and Conditions – What is expected of Participants:

1. The irrigation system must be fully functional without any major breaks, leaks or other damage, as far as you know.
2. The application form must be completed and signed.
3. The Irrigation System Evaluator will need access to the property, including the area where the time clock is installed. The participant or an adult representative will need to be available.
4. The Irrigation System Evaluator is on-site to evaluate the system and to recommend modifications. They are **not** authorized to make recommended modifications or repairs.
5. Any licensed irrigation professional can make the recommended modifications, if the participant chooses to hire someone.
6. Any costs incurred in making recommended modifications will be at the participant's expense.
7. The participant or adult representative agrees to participate in a follow-up evaluation regarding the suggested sprinkler system modifications. If the participant is chosen to participate in a Follow-up Evaluation, this visit will be scheduled approximately 10 to 12 months after the initial visit.
8. A customer satisfaction survey will be completed and returned at the end of the program.

If you have further questions related to this program, please call

LuAnne Stout at 352-527-5795 or email lstout@wrwsa.org

Irrigation Evaluation Program (N822) Application Form

Residential Water Customer Information:

Printed Name:	Water Account Number:	Phone Number(s):
Street Address with Zip Code:		Email Address:

If the irrigation system is not functioning, it must be repaired before an evaluation can be scheduled. Is your irrigation system operational and without any major breaks or leaks? _____Yes _____No

The Irrigation System water must be purchased from Citrus County Utilities to participate in this program. Those connected to a private well are NOT eligible.

Do you have a rain sensor installed on your automatic in-ground sprinkler system?

_____Yes _____No _____Don't Know

How many zones does your sprinkler system contain?

___1-4 zones ___5-8 zones ___If more than 8, indicate how many.

How old is your controller?

____1-5 years ____6-10 years ____11-15 years ____16+ years ____Don't Know

Irrigation Controller:

Brand:_____ Model:_____

Does the controller have pins that are pushed or pulled to schedule the system?

_____Yes _____No

On a scale of 1-10, 10 being the most knowledgeable, how would you rate your understanding of your irrigation controller? ____

On a scale of 1-10, 10 being the most capable, how would you rate your ability to modify the irrigation schedule (day of week, time of day) using the controller? ____

Does a hired professional adjust your controller for you? ____Yes ____No

Wireless internet connection (WiFi) is used for some smart controllers. Do you have WiFi at your home? ____Yes ____No

If you could upgrade your existing controller, which feature would you find most desirable?

____ Irrigation schedule able to be modified from anywhere in the world via Smart Phone

____ Irrigation schedule modified on the irrigation control panel

____ Both of the above are desired

____ I'm not interested in an updated controller

On average, how many gallons of water do you think your household uses a day (while bathing/showering, cooking, washing clothes, watering the lawn, etc.)?

___0-50 gallons ___50-100 gallons ___100-150 gallons ___150-200 gallons ___200+ gallons

(Please Turn Page Over for Program Guidelines)

By signing below, I certify that I have read and will abide by the program guidelines as outlined. In addition, I certify that my entire irrigation system is in good operating condition. In the event my irrigation system or major parts of my irrigation system are inoperable when the System Evaluator arrives to conduct the irrigation system evaluation, I understand that I will be ineligible to receive the requested evaluation.

Name (Please Print) _____ Signature _____ Date _____

This program is cooperatively funded by the Withlacoochee Regional Water Supply Authority, Citrus County Utilities, and the Southwest Florida Water Management District.

FREE

IRRIGATION SYSTEM EVALUATION

This program is for Citrus County Utilities single-family residential customers that have an in-ground irrigation / sprinkler system connected to the utility's water supply.

How to Participate:

1. Complete and sign the application on the back of this page.
2. Return the application via mail, email, fax or hand deliver. We have provided a self-addressed, stamped envelope for your convenience. Other delivery options below:
    - Email to: lstout@wrwsa.org
    - Fax: 352-527-5797
    - Deliver to: WRWSA, 3600 W. Sovereign Path, Ste 228, Lecanto FL 34461
3. The Program's contractor, Jack Overdorff, will contact you to arrange an appointment to perform an evaluation of your irrigation system. You must be present at the time of the evaluation and will need to provide access to your property and sprinkler system's time clock.

What to Expect from the Irrigation Evaluation Program:

1. ***At no cost to you***, an irrigation system evaluation, including suggested changes to improve the operation and efficiency of your irrigation system**.**
2. Installation of a rain sensor where a rain sensor is not present or is inoperable. Acceptance of a functioning rain sensor is a requirement to participate in this program. ***There is no cost to you.***
3. Educational materials on water conservation, ***at no cost to you*****.**
4. Likely, reduction in water use and lower water bills.
5. Possible improvement in the health and appearance of your lawn and landscape over time.

Program Terms and Conditions – What is expected of Participants:

1. The irrigation system must be fully functional without any major breaks, leaks or other damage.
2. The application form must be completed and signed.
3. The Irrigation System Evaluator will need access to the property, including the area where the time clock is installed. The participant or an adult representative will need to be available.
4. The Irrigation System Evaluator is on-site to evaluate the system and to recommend modifications. The evaluator is **only** authorized to make minor modifications or repairs necessary to improve system efficiency. The evaluator may also replace the irrigation controller under special circumstances.
5. Recommended modifications not carried out by the evaluator can be done by any licensed irrigation professional, should the participant choose to hire someone.
6. The irrigation system must be connected to Citrus County Utilities water supply. Systems connected to a private well do not qualify for this program.
7. Any costs incurred by hiring a licensed professional to make modifications are the participant's responsibility.
8. The participant or adult representative agrees to participate in a follow-up evaluation regarding the suggested sprinkler system modifications. If the participant is chosen to participate in a Follow-up Evaluation, this visit will be scheduled approximately 10 to 12 months after the initial visit.
9. Participant agrees to complete and return a customer satisfaction survey at the end of the program.

If you have further questions related to this program, please call LuAnne Stout
352-527-5795 or lstout@wrwsa.org

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

NSCUDD North Sumter County UTILITY Dependent District

VCDD UTILITIES

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, _____ 20__, 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.

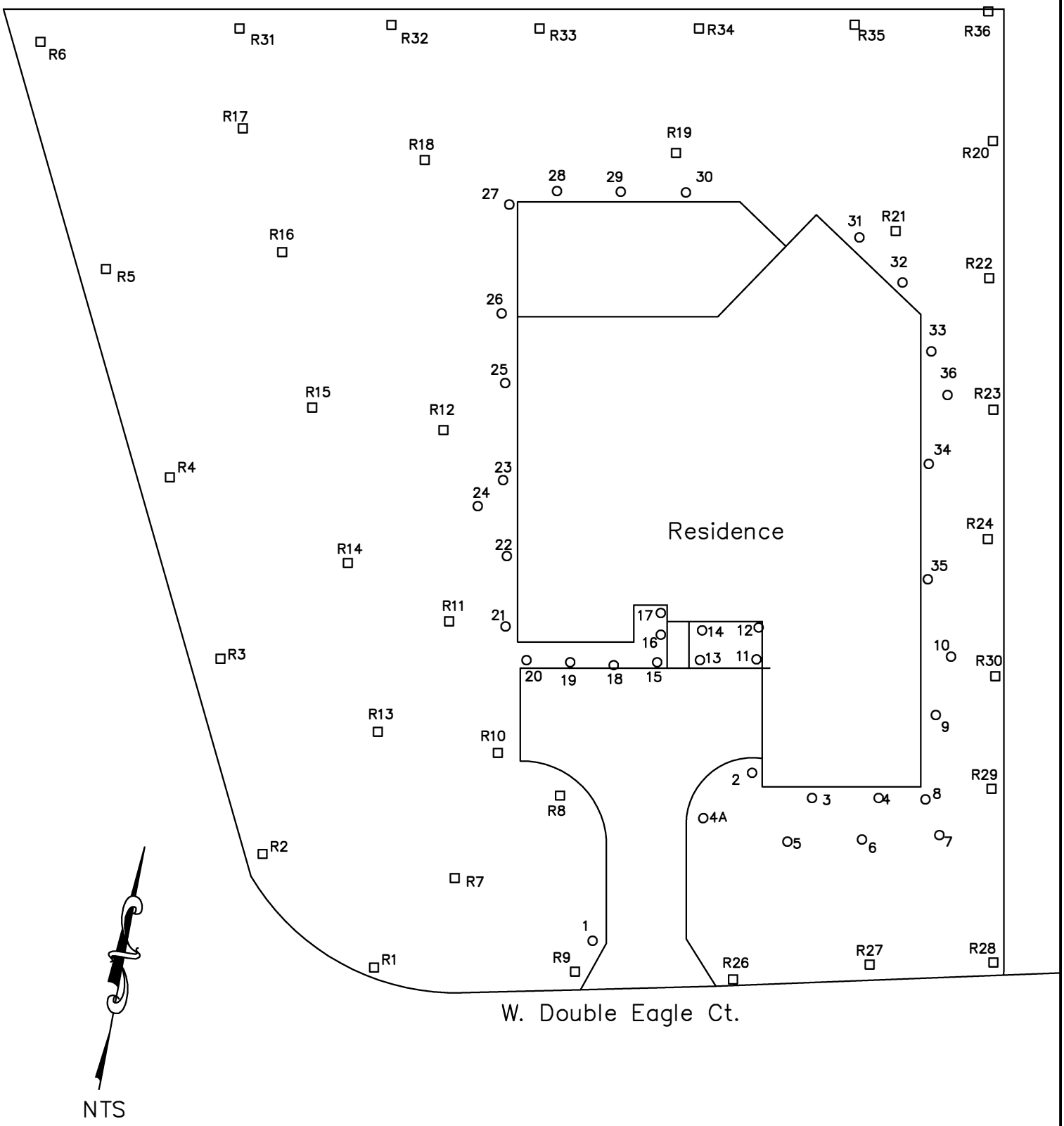
Approximately once per month inspect the irrigation system. Turn on each irrigation zone and visually examine all sprinkler heads. (Are they broken, spraying in the wrong direction or not rotating?) Take notes for later reference. Ten minutes of operation time is allowed for this inspection.

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 Material

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

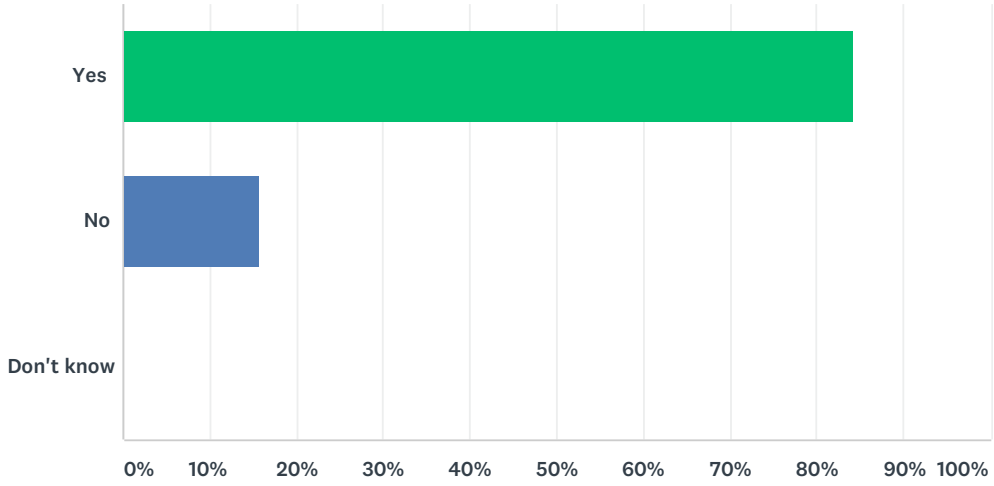
The educational materials were ordered by Jack Overdorff, the irrigation evaluation contractor, and distributed during the onsite irrigation system evaluation.

Appendix D

Customer Satisfaction Survey

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

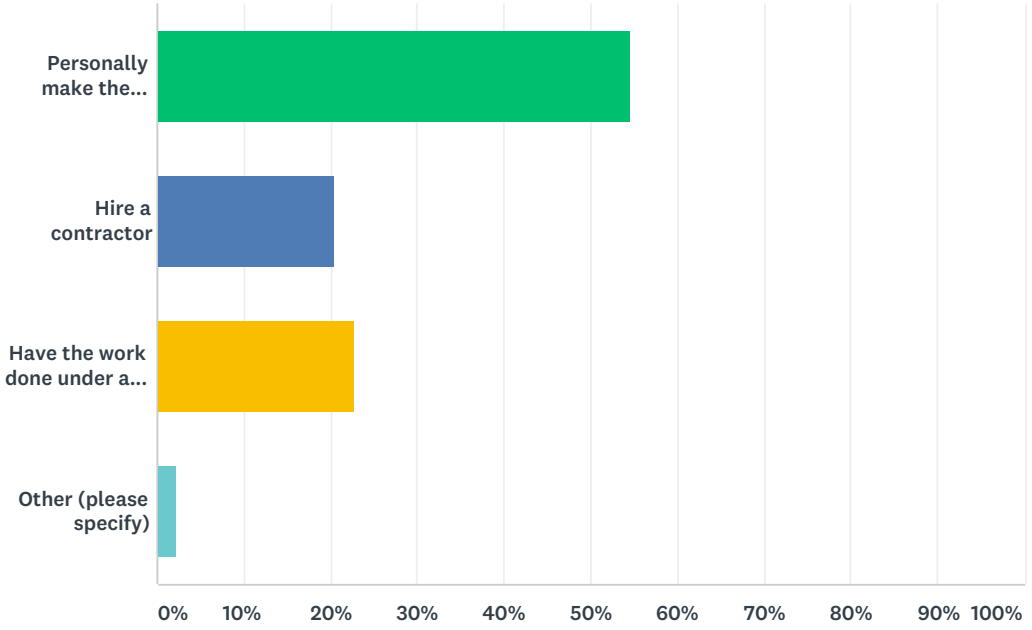
Answered: 51 Skipped: 0



ANSWER CHOICES	RESPONSES	
Yes	84.31%	43
No	15.69%	8
Don't know	0.00%	0
TOTAL		51

Q2 If you made changes to your system, did you

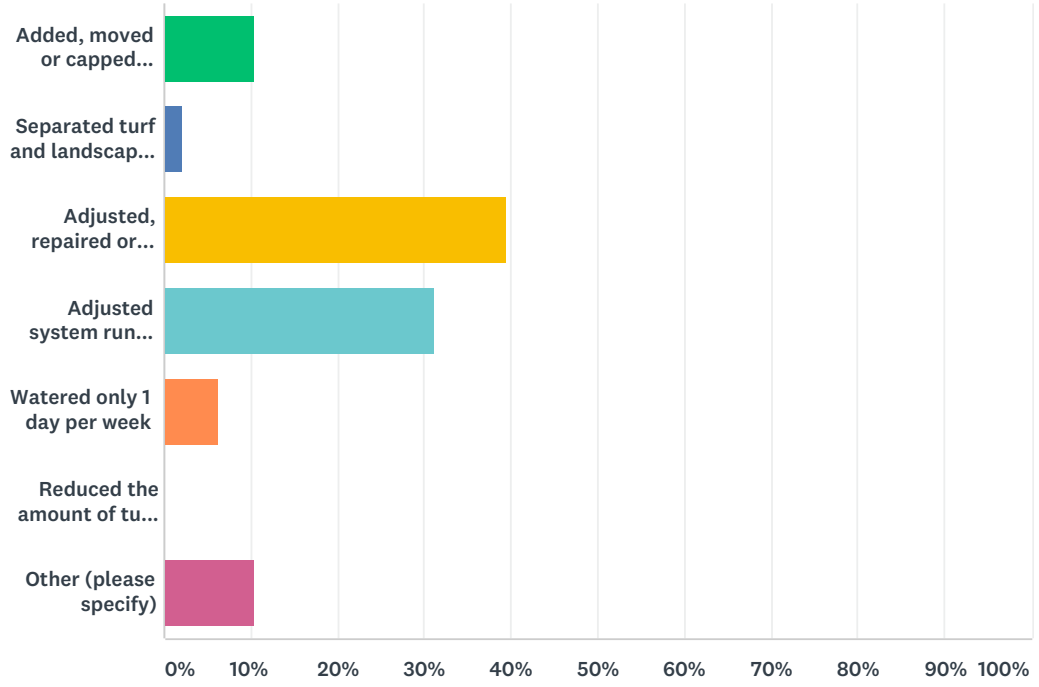
Answered: 44 Skipped: 7



ANSWER CHOICES	RESPONSES	
Personally make the changes	54.55%	24
Hire a contractor	20.45%	9
Have the work done under an existing irrigation maintenance contract	22.73%	10
Other (please specify)	2.27%	1
TOTAL		44

Q3 What changes did you make to your irrigation system?

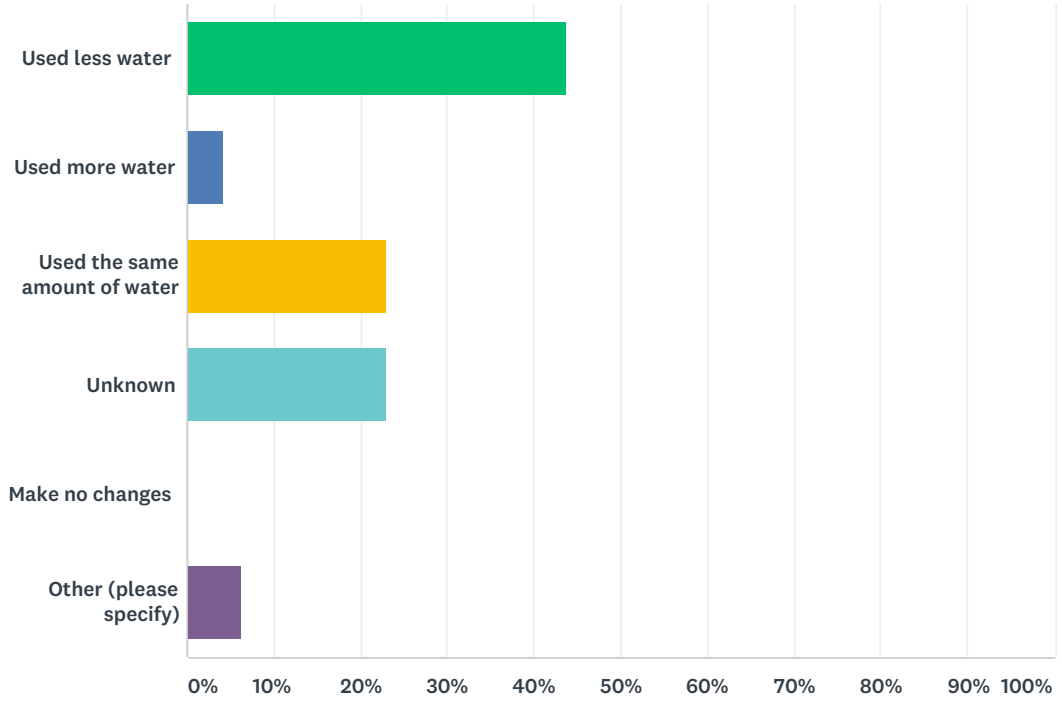
Answered: 48 Skipped: 3



ANSWER CHOICES	RESPONSES	
Added, moved or capped sprinkler heads	10.42%	5
Separated turf and landscape zones	2.08%	1
Adjusted, repaired or replaced sprinkler heads	39.58%	19
Adjusted system run times	31.25%	15
Watered only 1 day per week	6.25%	3
Reduced the amount of turf grass	0.00%	0
Other (please specify)	10.42%	5
TOTAL		48

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

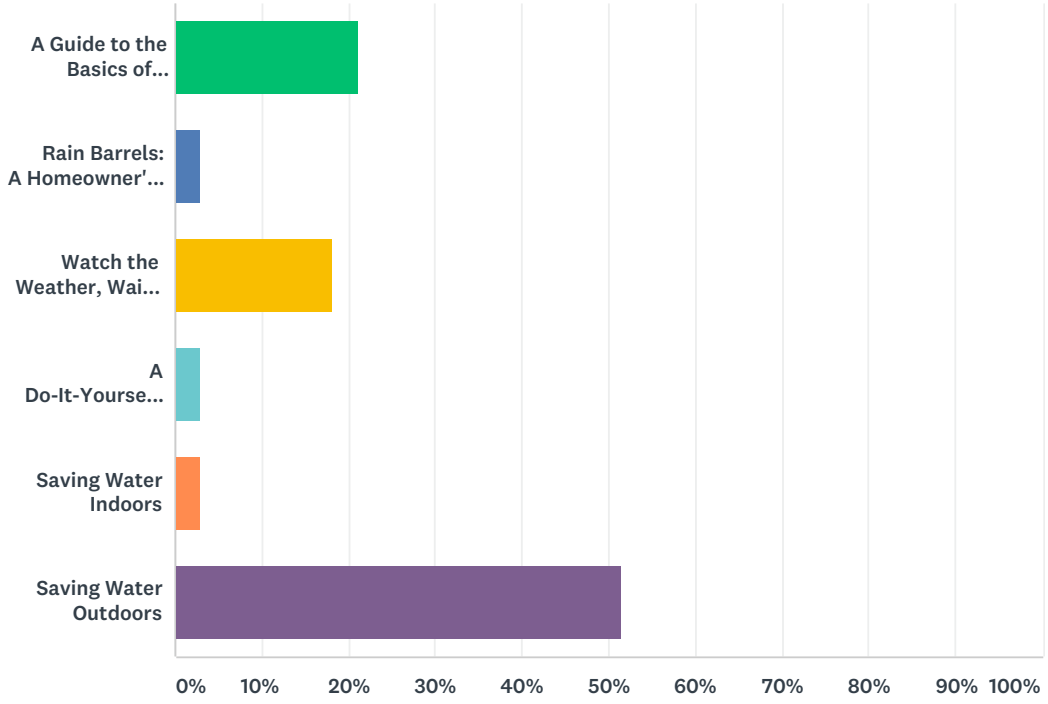
Answered: 48 Skipped: 3



ANSWER CHOICES	RESPONSES	
Used less water	43.75%	21
Used more water	4.17%	2
Used the same amount of water	22.92%	11
Unknown	22.92%	11
Make no changes	0.00%	0
Other (please specify)	6.25%	3
TOTAL		48

Q5 Which educational information provided was most helpful?

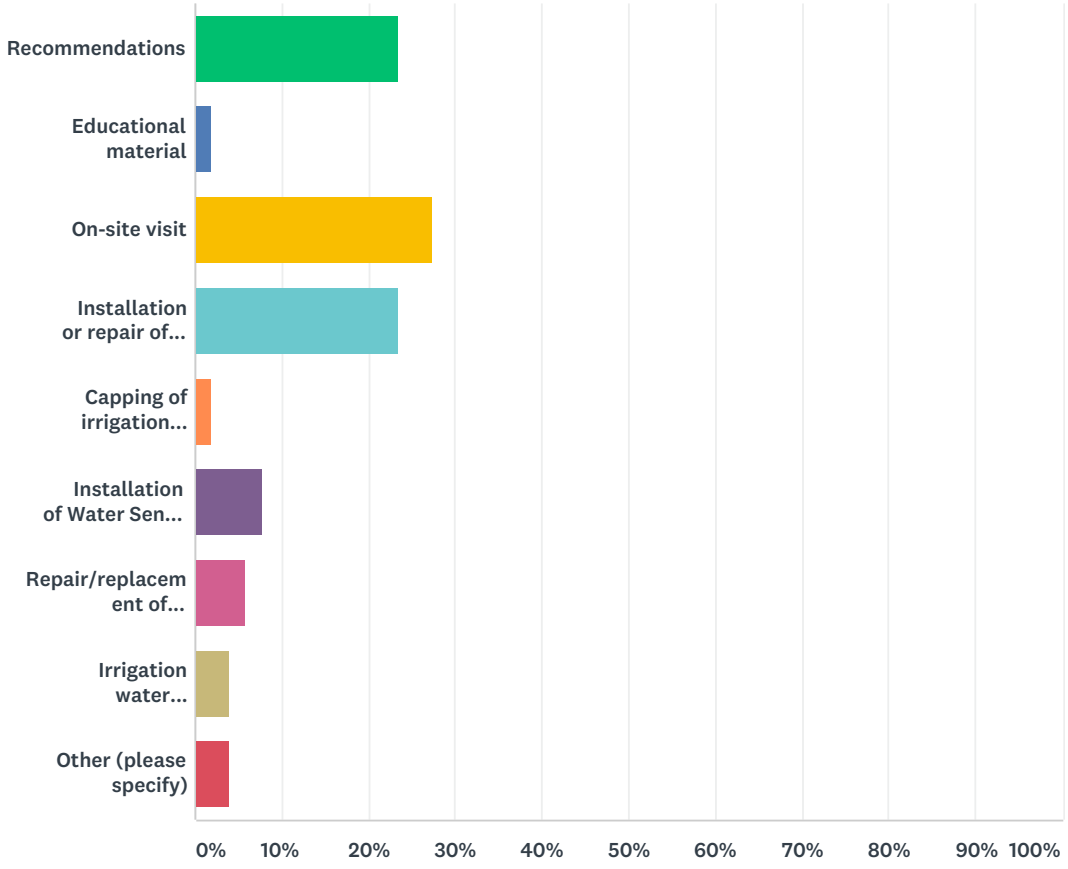
Answered: 33 Skipped: 18



ANSWER CHOICES	RESPONSES	
A Guide to the Basics of Micro-Irrigation	21.21%	7
Rain Barrels: A Homeowner's Guide	3.03%	1
Watch the Weather, Wait to Water!	18.18%	6
A Do-It-Yourself Guide to Florida Friendly Fertilizing	3.03%	1
Saving Water Indoors	3.03%	1
Saving Water Outdoors	51.52%	17
TOTAL		33

Q6 What was the most helpful part of the evaluation?

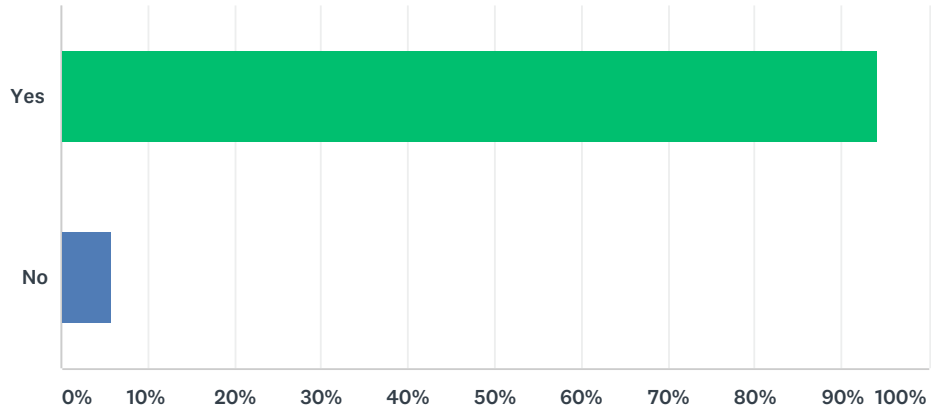
Answered: 51 Skipped: 0



ANSWER CHOICES	RESPONSES	
Recommendations	23.53%	12
Educational material	1.96%	1
On-site visit	27.45%	14
Installation or repair of rain-sensor	23.53%	12
Capping of irrigation heads	1.96%	1
Installation of Water Sense Controller	7.84%	4
Repair/replacement of irrigation heads	5.88%	3
Irrigation water consumption/application calculations	3.92%	2
Other (please specify)	3.92%	2
TOTAL		51

Q7 Would you recommend this program to a neighbor?

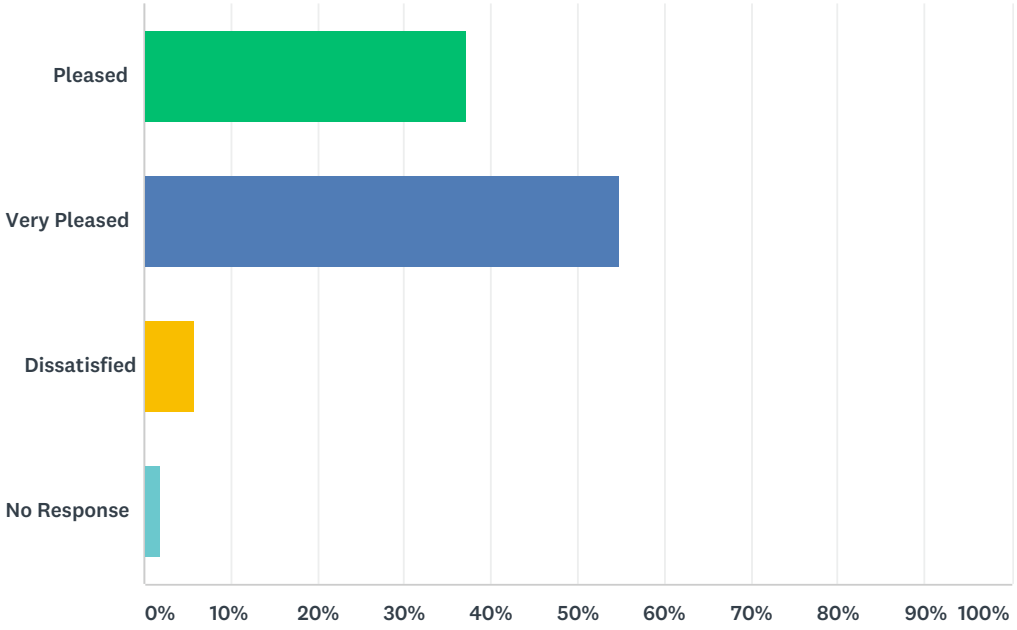
Answered: 51 Skipped: 0



ANSWER CHOICES	RESPONSES	
Yes	94.12%	48
No	5.88%	3
TOTAL		51

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

Answered: 51 Skipped: 0



ANSWER CHOICES	RESPONSES	
Pleased	37.25%	19
Very Pleased	54.90%	28
Dissatisfied	5.88%	3
No Response	1.96%	1
TOTAL		51

Q9 Other comments:

Answered: 9 Skipped: 42

Responses

1	After he left noticed that 2 of my sprinkler were leaking after he adjusted them.
2	Wish I could have made multiple selections to what I did. It was very helpful.
3	This was a great thing to do because we found out that there were to many sprinkler heads installed when the house was built. We also watch the weather and if it rains we will shut the system off even though the rain gauge was replaced. Thank You!!
4	The technician was thorough and knowledgeable. Made the changes necessary to insure my turf and shrubs were getting the right amount of water.
5	Very pleased to have this wonderful evaluation completed
6	Thank you so much. The gentleman you sent to my home was very professional and very educated.
7	Received no educational materials; instructed irrigation contractor to make all recommendations which cost $750 and no noticeable difference in water bill.
8	Next thing we are going to tackle is the sprinklers in the bushes hopefully this fall. Thank you for your help.

Appendix E

Water Use Data by Utility

Count	City	EVALUATION DATE	Unadjusted Data				Adjusted for Partial Data*			
			12-Month Pre-Usage	12-Month Post Usage	Year One Gallons Saved (in thousands)	Year One % Saved	12-Month Pre-Usage	12-Month Post Usage	Year One Gallons Saved (in thousands)	Year One % Saved
Citrus County										
1	Homosassa	12/2/2016	495,000	258,000	237,000	48%	495,000	258,000	237,000	48%
2	Homosassa	12/7/2016	443,000	302,000	141,000	32%	443,000	302,000	141,000	32%
3	Homosassa	12/15/2016	472,000	226,000	246,000	52%	472,000	226,000	246,000	52%
4	Homosassa	12/16/2016	439,000	225,000	214,000	49%	439,000	245,455	193,545	44%
5	Homosassa	12/21/2016	393,000	224,000	169,000	43%	393,000	224,000	169,000	43%
6	Homosassa	12/21/2016	478,000	623,000	-145,000	-30%				
7	Homosassa	12/29/2016	495,000	84,000	411,000	83%				
8	Homosassa	1/3/2017	524,000	175,000	349,000	67%	524,000	175,000	349,000	67%
9	Homosassa	1/4/2017	437,000	336,000	101,000	23%	437,000	336,000	101,000	23%
10	Homosassa	1/18/2017	489,000	349,000	140,000	29%	489,000	349,000	140,000	29%
11	Homosassa	1/19/2017	426,000	237,000	189,000	44%	426,000	237,000	189,000	44%
12	Homosassa	1/23/2017	333,000	150,000	183,000	55%	363,273	163,636	199,636	55%
13	Homosassa	1/26/2017	306,000	239,000	67,000	22%	306,000	239,000	67,000	22%
14	Homosassa	1/30/2017	601,000	176,000	425,000	71%	601,000	176,000	425,000	71%
15	Homosassa	2/1/2017	739,000	119,000	620,000	84%				
16	Homosassa	2/7/2017	442,000	175,000	267,000	60%	442,000	175,000	267,000	60%
17	Homosassa	2/15/2017	449,000	550,000	-101,000	-22%	449,000	325,200	123,800	28%
18	Homosassa	2/21/2017	295,000	185,000	110,000	37%	295,000	185,000	110,000	37%
19	Homosassa	2/24/2017	507,000	352,000	155,000	31%	507,000	352,000	155,000	31%
20	Lecanto	2/27/2017	383,000	206,000	177,000	46%	383,000	206,000	177,000	46%
21	Hernando	3/10/2017	334,000	246,000	88,000	26%	334,000	246,000	88,000	26%
22	Hernando	3/22/2017	550,000	222,000	328,000	60%	550,000	222,000	328,000	60%
23	Lecanto	3/24/2017	281,000	188,000	93,000	33%	281,000	188,000	93,000	33%
24	Hernando	3/24/2017	628,000	426,000	202,000	32%	628,000	426,000	202,000	32%
25	Lecanto	3/28/2017	546,000	523,000	23,000	4%	546,000	523,000	23,000	4%
26	Hernando	3/30/2017	575,000	367,000	208,000	36%	575,000	367,000	208,000	36%
27	Lecanto	4/3/2017	500,000	258,000	242,000	48%	500,000	258,000	242,000	48%
28	Lecanto	4/4/2017	481,000	237,000	244,000	51%	481,000	237,000	244,000	51%
29	Hernando	4/6/2017	501,000	314,000	187,000	37%	501,000	314,000	187,000	37%
30	Hernando	4/18/2017	451,000	240,000	211,000	47%	451,000	240,000	211,000	47%
31	Lecanto	4/24/2017	521,000	171,000	350,000	67%	521,000	171,000	350,000	67%
32	Hernando	4/25/2017	635,000	433,000	202,000	32%	635,000	433,000	202,000	32%
33	Lecanto	5/12/2017	700,000	466,000	234,000	33%	700,000	466,000	234,000	33%
34	Inverness	5/19/2017	521,000	332,000	189,000	36%	521,000	332,000	189,000	36%
35	Inverness	6/27/2017	525,000	295,000	230,000	44%	525,000	295,000	230,000	44%
36	Hernando	6/28/2017	385,000	232,000	153,000	40%	420,000	179,000	241,000	57%
37	Lecanto	7/7/2017	567,000	203,000	364,000	64%	567,000	221,455	345,545	61%
38	Homosassa	7/28/2017	349,000	203,000	146,000	42%	349,000	203,000	146,000	42%
39	Lecanto	8/4/2017	648,000	442,000	206,000	32%	648,000	442,000	206,000	32%
40	Homosassa	12/22/2017	375,000	262,000	113,000	30%	375,000	262,000	113,000	30%
41	Homosassa	12/22/2017	431,000	273,000	158,000	37%	431,000	273,000	158,000	37%
42	Homosassa	1/11/2018	346,000	365,000	-19,000	-5%	346,000	365,000	-19,000	-5%
43	Homosassa	1/11/2018	340,000	217,000	123,000	36%	340,000	217,000	123,000	36%
44	Hernando	1/17/2018	323,000	157,000	166,000	51%	323,000	157,000	166,000	51%
45	Hernando	1/17/2018	316,000	286,000	30,000	9%	316,000	286,000	30,000	9%
46	Hernando	1/17/2018	338,000	291,000	47,000	14%	338,000	291,000	47,000	14%
47	Hernando	1/23/2018	339,000	198,000	141,000	42%	339,000	198,000	141,000	42%
48	Lecanto	1/24/2018	456,000	393,000	63,000	14%	456,000	393,000	63,000	14%
49	Lecanto	1/31/2018	343,000	248,000	95,000	28%	343,000	248,000	95,000	28%
50	Hernando	1/31/2018	322,000	383,000	-61,000	-19%	322,000	383,000	-61,000	-19%
51	Hernando	2/12/2018	324,000	337,000	-13,000	-4%	324,000	337,000	-13,000	-4%
52	Lecanto	2/12/2018	400,000	250,000	150,000	38%	400,000	250,000	150,000	38%
53	Lecanto	2/12/2018	300,000	185,000	115,000	38%	300,000	185,000	115,000	38%
54	Lecanto	4/3/2018	488,000	239,000	249,000	51%	488,000	239,000	249,000	51%
55	Lecanto	4/10/2018	333,000	141,000	192,000	58%	333,000	141,000	192,000	58%
56	Lecanto	4/10/2018	852,000	449,000	403,000	47%	852,000	449,000	403,000	47%
57	Hernando	4/10/2018	334,000	284,000	50,000	15%	334,000	284,000	50,000	15%
58	Hernando	7/30/2018	363,000	176,000	187,000	52%	363,000	176,000	187,000	52%
Citrus County Subtotals			26,167,000	16,123,000	10,044,000	38%	24,520,273	15,071,745	9,448,527	39%

Count	City	EVALUATION DATE	Unadjusted Data				Adjusted for Partial Data*			
			12-Month Pre-Usage	12-Month Post Usage	Year One Gallons Saved (in thousands)	Year One % Saved	12-Month Pre-Usage	12-Month Post Usage	Year One Gallons Saved (in thousands)	Year One % Saved
Hernando County										
1	Brooksville	5/9/2017	314,100	232,100	82,000	26%	314,100	232,100	82,000	26.11%
2	Spring Hill	5/15/2017	393,500	187,600	205,900	52%	393,500	187,600	205,900	52.33%
3	Spring Hill	6/2/2017	443,500	346,900	96,600	22%	443,500	346,900	96,600	21.78%
4	Spring Hill	8/15/2017	347,200	155,900	191,300	55%	347,200	155,900	191,300	55.10%
5	Spring Hill	8/16/2017	214,800	230,300	-15,500	-7%	257,760	276,360	-18,600	-7%
6	Spring Hill	8/22/2017	434,400	227,400	207,000	48%	434,400	227,400	207,000	47.65%
7	Spring Hill	8/23/2017	398,600	99,700	298,900	75%	398,600	99,700	298,900	74.99%
8	Spring Hill	8/29/2017	311,000	133,300	177,700	57%	311,000	133,300	177,700	57.14%
9	Spring Hill	9/1/2017	370,400	295,400	75,000	20%	370,400	295,400	75,000	20.25%
10	Spring Hill	9/5/2017	411,700	381,200	30,500	7%	411,700	381,200	30,500	7.41%
11	Spring Hill	9/15/2017	452,700	108,300	344,400	76%	452,700	108,300	344,400	76.08%
12	Spring Hill	9/18/2017	408,100	442,800	-34,700	-9%	408,100	442,800	-34,700	-8.50%
13	Spring Hill	9/19/2017	430,600	138,100	292,500	68%	430,600	138,100	292,500	67.93%
14	Spring Hill	9/21/2017	344,100	296,500	47,600	14%	344,100	296,500	47,600	13.83%
15	Spring Hill	9/25/2017	466,900	261,500	205,400	44%	466,900	261,500	205,400	43.99%
16	Spring Hill	9/27/2017	306,700	203,100	103,600	34%	306,700	203,100	103,600	33.78%
17	Spring Hill	10/6/2017	185,000	146,100	38,900	21%	185,000	146,100	38,900	21.03%
18	Spring Hill	10/6/2017	319,200	181,500	137,700	43%	319,200	181,500	137,700	43.14%
19	Spring Hill	10/10/2017	183,400	1,606,400	-1,423,000	-776%	183,400	204,436	-21,036	-11%
20	Spring Hill	10/19/2017	300,700	223,800	76,900	26%	300,700	223,800	76,900	25.57%
21	Spring Hill	10/26/2017	243,400	172,600	70,800	29%	243,400	172,600	70,800	29.09%
22	Spring Hill	11/2/2017	314,800	202,300	112,500	36%	314,800	202,300	112,500	35.74%
23	Spring Hill	11/7/2017	414,500	393,600	20,900	5%	414,500	393,600	20,900	5.04%
24	Spring Hill	11/8/2017	387,300	194,300	193,000	50%	387,300	194,300	193,000	49.83%
25	Weeki Wachee	11/17/2011	283,900	230,800	53,100	19%	283,900	230,800	53,100	18.70%
26	Weeki Wachee	11/29/2017	315,500	124,200	191,300	61%	315,500	336,620	-21,120	-7%
27	Weeki Wachee	11/29/2017	303,500	85,600	217,900	72%	110,520	128,400	-17,880	-16%
28	Weeki Wachee	11/30/2017	321,800	207,100	114,700	36%	321,800	207,100	114,700	35.64%
29	Weeki Wachee	12/4/2017	302,700	201,900	100,800	33%	302,700	201,900	100,800	33.30%
30	Weeki Wachee	12/6/2017	436,500	339,200	97,300	22%	436,500	339,200	97,300	22.29%
31	Weeki Wachee	12/8/2017	283,600	236,600	47,000	17%	283,600	236,600	47,000	16.57%
32	Weeki Wachee	12/8/2017	268,200	154,100	114,100	43%	268,200	154,100	114,100	42.54%
33	Weeki Wachee	1/25/2018	295,800	161,200	134,600	46%	295,800	161,200	134,600	45.50%
34	Weeki Wachee	1/25/2018	358,500	326,200	32,300	9%	358,500	326,200	32,300	9.01%
35	Weeki Wachee	1/29/2018	294,400	249,700	44,700	15%	294,400	249,700	44,700	15.18%
36	Weeki Wachee	1/29/2018	384,700	311,400	73,300	19%	461,640	311,400	150,240	33%
37	Weeki Wachee	2/7/2018	385,200	159,200	226,000	59%	385,200	212,233	172,967	45%
38	Weeki Wachee	2/7/2018	369,000	222,300	146,700	40%	369,000	222,300	146,700	39.76%
39	Weeki Wachee	2/20/2018	628,700	338,800	289,900	46%	628,700	338,800	289,900	46.11%
40	Weeki Wachee	2/20/2018	353,600	237,900	115,700	33%	353,600	237,900	115,700	32.72%
41	Weeki Wachee	3/8/2018	327,500	250,800	76,700	23%	327,500	250,800	76,700	23.42%
42	Weeki Wachee	3/8/2018	238,300	142,200	96,100	40%	238,300	142,200	96,100	40.33%
43	Weeki Wachee	3/22/2018	316,800	308,000	8,800	3%	316,800	308,000	8,800	2.78%
44	Weeki Wachee	3/22/2018	326,800	173,700	153,100	47%	326,800	173,700	153,100	46.85%
45	Weeki Wachee	3/22/2018	291,900	344,800	-52,900	-18%	291,900	344,800	-52,900	-18.12%
46	Weeki Wachee	4/5/2018	489,900	384,700	105,200	21%	489,900	384,700	105,200	21.47%
47	Weeki Wachee	4/5/2018	340,400	336,600	3,800	1%	340,400	336,600	3,800	1.12%
48	Weeki Wachee	5/8/2018	242,600	152,600	90,000	37%	242,600	152,600	90,000	37.10%
49	Weeki Wachee	5/8/2018	404,600	159,000	245,600	61%	404,600	159,000	245,600	60.70%
50	Weeki Wachee	5/15/2018	306,400	213,000	93,400	30%	306,400	213,000	93,400	30.48%
51	Weeki Wachee	5/15/2018	402,300	307,400	94,900	24%	402,300	307,400	94,900	23.59%
52	Weeki Wachee	5/22/2018	239,500	97,600	141,900	59%	239,500	224,663	14,838	6%
53	Weeki Wachee	5/22/2018	270,600	208,700	61,900	23%	270,600	208,700	61,900	22.88%
54	Weeki Wachee	5/22/2018	255,800	216,400	39,400	15%	255,800	216,400	39,400	15.40%
55	Weeki Wachee	5/31/2018	349,200	251,500	97,700	28%	349,200	335,333	13,867	4%
56	Weeki Wachee	5/31/2018	124,200	193,200	-69,000	-56%	124,200	193,200	-69,000	-55.56%
57	Weeki Wachee	7/2/2018	284,700	229,400	55,300	19%	284,700	229,400	55,300	19.42%
58	Weeki Wachee	7/2/2018	421,200	250,500	170,700	41%	421,200	250,500	170,700	40.53%
59	Weeki Wachee	7/6/2018	300,800	116,200	184,600	61%	300,800	116,200	184,600	61.37%
60	Weeki Wachee	7/6/2018	335,000	224,600	110,400	33%	335,000	224,600	110,400	32.96%
61	Spring Hill	8/3/2018	195,400	226,800	-31,400	-16%	195,400	226,800	-31,400	-16.07%

Count	City	EVALUATION DATE	Unadjusted Data				Adjusted for Partial Data*			
			12-Month Pre-Usage	12-Month Post Usage	Year One Gallons Saved (in thousands)	Year One % Saved	12-Month Pre-Usage	12-Month Post Usage	Year One Gallons Saved (in thousands)	Year One % Saved
62	Spring Hill	8/3/2018	423,400	288,700	134,700	32%	423,400	288,700	134,700	31.81%
63	Spring Hill	8/3/2018	382,800	337,600	45,200	12%	382,800	337,600	45,200	11.81%
64	Spring Hill	8/20/2018	373,500	296,900	76,600	21%	373,500	296,900	76,600	20.51%
65	Spring Hill	8/20/2018	235,700	213,000	22,700	10%	235,700	213,000	22,700	9.63%
66	Spring Hill	8/24/2018	235,900	123,700	112,200	48%	235,900	185,550	50,350	21%
Hernando County Subtotals			22,097,400	16,494,500	5,602,900	25%	22,024,320	15,719,596	6,304,724	29%
Marion County										
1	Ocala	5/11/2017	246,000	293,000	-47,000	-19%	246,000	293,000	-47,000	-19%
2	Ocala	8/8/2017	245,000	320,000	-75,000	-31%	420,000	320,000	100,000	24%
3	Ocala	8/10/2017	159,000	124,000	35,000	22%	159,000	124,000	35,000	22%
4	Ocala	8/18/2017	324,000	161,000	163,000	50%	324,000	161,000	163,000	50%
5	Ocala	8/18/2017	237,000	199,000	38,000	16%	237,000	199,000	38,000	16%
6	Ocala	9/6/2017	255,000	230,000	25,000	10%	255,000	230,000	25,000	10%
7	Ocala	10/20/2017	115,000	89,000	26,000	23%	115,000	89,000	26,000	23%
8	Ocala	11/10/2017	155,000	123,000	32,000	21%	155,000	123,000	32,000	21%
9	Ocala	4/13/2018	189,000	116,000	73,000	39%	189,000	116,000	73,000	39%
10	Ocala	4/13/2016	96,000	68,000	28,000	29%	96,000	68,000	28,000	29%
11	Ocala	4/13/2018	95,000	87,000	8,000	8%	95,000	87,000	8,000	8%
12	Ocala	4/17/2018	286,000	161,000	125,000	44%	286,000	161,000	125,000	44%
13	Ocala	4/17/2018	113,000	109,000	4,000	4%	113,000	109,000	4,000	4%
14	Ocala	4/17/2018	156,000	135,000	21,000	13%	156,000	135,000	21,000	13%
15	Ocala	4/17/2018	186,000	220,000	-34,000	-18%	186,000	220,000	-34,000	-18%
16	Dunellon	4/20/2018	203,000	180,000	23,000	11%	203,000	180,000	23,000	11%
17	Dunellon	4/20/2018	183,000	157,000	26,000	14%	183,000	157,000	26,000	14%
18	Dunellon	4/20/2018	187,000	152,000	35,000	19%	187,000	152,000	35,000	19%
19	Ocala	4/23/2018	155,000	76,000	79,000	51%	155,000	76,000	79,000	51%
20	Ocala	4/23/2018	148,000	162,000	-14,000	-9%	148,000	162,000	-14,000	-9%
21	Ocala	4/23/2018	189,000	82,000	107,000	57%				
22	Ocala	4/25/2018	149,000	98,000	51,000	34%	149,000	98,000	51,000	34%
23	Ocala	4/25/2018	178,000	137,000	41,000	23%	178,000	137,000	41,000	23%
24	Ocala	4/25/2018	211,000	192,000	19,000	9%	211,000	192,000	19,000	9%
25	Ocala	5/10/2018	104,000	53,000	51,000	49%	104,000	53,000	51,000	49%
26	Ocala	5/10/2018	111,000	105,000	6,000	5%	111,000	105,000	6,000	5%
27	Ocala	5/10/2018	143,000	83,000	60,000	42%	143,000	83,000	60,000	42%
28	Ocala	5/18/2018	132,000	151,000	-19,000	-14%	132,000	151,000	-19,000	-14%
29	Ocala	5/18/2018	270,000	185,000	85,000	31%	270,000	185,000	85,000	31%
30	Ocala	5/18/2018	314,000	227,000	87,000	28%	314,000	227,000	87,000	28%
31	Ocala	6/26/2018	265,000	337,000	-72,000	-27%	265,000	337,000	-72,000	-27%
32	Ocala	6/26/2018	241,000	201,000	40,000	17%	241,000	201,000	40,000	17%
33	Ocala	6/26/2018	68,000	53,000	15,000	22%	68,000	53,000	15,000	22%
34	Ocala	6/26/2018	116,000	44,000	72,000	62%	116,000	44,000	72,000	62%
35	Ocala	6/28/2018	41,000	38,000	3,000	7%	41,000	38,000	3,000	7%
36	Ocala	6/28/2018	173,000	121,000	52,000	30%	173,000	121,000	52,000	30%
37	Ocala	6/28/2018	97,000	113,000	-16,000	-16%	97,000	113,000	-16,000	-16%
38	Ocala	6/26/2018	100,000	85,000	15,000	15%	100,000	85,000	15,000	15%
39	Ocala	7/5/2018	328,000	319,000	9,000	3%	328,000	319,000	9,000	3%
40	Ocala	7/5/2018	152,000	140,000	12,000	8%	152,000	140,000	12,000	8%
41	Ocala	7/8/2018	264,000	271,000	-7,000	-3%	264,000	271,000	-7,000	-3%
42	Ocala	7/5/2018	194,000	181,000	13,000	7%	194,000	181,000	13,000	7%
43	Ocala	7/27/2018	196,000	172,000	24,000	12%	196,000	172,000	24,000	12%
44	Ocala	7/27/2018	216,000	282,000	-66,000	-31%	216,000	282,000	-66,000	-31%
45	Ocala	7/27/2018	302,000	195,000	107,000	35%	302,000	195,000	107,000	35%
46	Ocala	8/1/2018	153,000	188,000	-35,000	-23%	153,000	188,000	-35,000	-23%
47	Ocala	8/1/2018	115,000	87,000	28,000	24%	115,000	87,000	28,000	24%
48	Ocala	8/1/2018	172,000	82,000	90,000	52%	172,000	82,000	90,000	52%
49	Ocala	8/21/2018	294,000	253,000	41,000	14%	294,000	253,000	41,000	14%
50	Ocala	8/21/2018	246,000	264,000	-18,000	-7%	246,000	264,000	-18,000	-7%
51	Ocala	8/21/2018	113,000	113,000	0	0%	113,000	113,000	0	0%
52	Ocala	8/21/2018	228,000	211,000	17,000	7%	228,000	211,000	17,000	7%
53	Ocala	8/23/2018	111,000	109,000	2,000	2%	111,000	109,000	2,000	2%

			Unadjusted Data				Adjusted for Partial Data*			
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54	Ocala	8/23/2018	105,000	95,000	10,000	10%	105,000	95,000	10,000	10%
55	Ocala	8/23/2018	113,000	101,000	12,000	11%	113,000	101,000	12,000	11%
56	Dunellon	8/31/2018	120,000	89,000	31,000	26%	120,000	89,000	31,000	26%
57	Dunellon	8/31/2018	147,000	103,000	44,000	30%	147,000	103,000	44,000	30%
58	Ocala	9/11/2018	18,000	21,000	-3,000	-17%	18,000	21,000	-3,000	-17%
59	Dunellon	9/11/2018	97,000	35,000	62,000	64%	105,818	46,667	59,152	56%
60	Ocala	9/11/2018	102,000	201,000	-99,000	-97%	102,000	201,000	-99,000	-97%
61	Ocala	9/13/2018	563,000	378,000	185,000	33%	563,000	378,000	185,000	33%
62	Ocala	9/13/2018	353,000	224,000	129,000	37%	353,000	224,000	129,000	37%
63	Dunellon	9/19/2018	200,000	240,000	-40,000	-20%	200,000	240,000	-40,000	-20%
64	Ocala	9/28/2018	87,000	26,000	61,000	70%	87,000	26,000	61,000	70%
65	Ocala	9/28/2018	99,000	124,000	-25,000	-25%	99,000	124,000	-25,000	-25%
66	Ocala	9/28/2018	83,000	128,000	-45,000	-54%	83,000	128,000	-45,000	-54%
Marion County Subtotals			11,806,000	10,099,000	1,707,000	14%	11,800,818	10,028,667	1,772,152	15%
VCCDD - LSSA										
1	The Villages	3/3/2017	378,420	155,220	223,200	59%	378,420	155,220	223,200	59%
2	The Villages	3/8/2017	435,390	191,800	243,590	56%	435,390	191,800	243,590	56%
3	The Villages	3/8/2017	410,130	325,750	84,380	21%	410,130	325,750	84,380	21%
4	The Villages	4/12/2017	372,390	167,710	204,680	55%	372,390	167,710	204,680	55%
5	The Villages	4/13/2017	507,110	235,900	271,210	53%	507,110	235,900	271,210	53%
6	The Villages	4/13/2017	320,150	177,760	142,390	44%	320,150	177,760	142,390	44%
7	The Villages	5/1/2017	245,950	136,640	109,310	44%	245,950	136,640	109,310	44%
8	The Villages	5/1/2017	413,170	252,410	160,760	39%	550,893	252,410	298,483	54%
9	The Villages	1/19/2018	284,070	348,570	-64,500	-23%	284,070	348,570	-64,500	-23%
10	The Villages	1/19/2018	316,990	313,650	3,340	1%	316,990	313,650	3,340	1%
11	The Villages	1/19/2018	423,820	110,970	312,850	74%	423,820	110,970	312,850	74%
12	The Villages	1/26/2018	323,170	282,050	41,120	13%	323,170	282,050	41,120	13%
13	The Villages	1/26/2018	265,580	144,380	121,200	46%	265,580	144,380	121,200	46%
14	The Villages	1/26/2018	314,800	155,290	159,510	51%	314,800	155,290	159,510	51%
15	The Villages	1/30/2018	365,320	302,370	62,950	17%	365,320	302,370	62,950	17%
16	The Villages	1/30/2018	239,920	96,960	142,960	60%	239,920	96,960	142,960	60%
17	The Villages	1/30/2018	345,600	229,750	115,850	34%	345,600	229,750	115,850	34%
18	The Villages	4/6/2018	346,540	319,390	27,150	8%	346,540	319,390	27,150	8%
19	The Villages	4/6/2018	259,790	222,410	37,380	14%	259,790	222,410	37,380	14%
20	The Villages	4/27/2018	340,240	260,530	79,710	23%	340,240	260,530	79,710	23%
21	The Villages	4/27/2018	147,950	161,190	-13,240	-9%	147,950	161,190	-13,240	-9%
22	The Villages	4/27/2018	272,720	210,780	61,940	23%	272,720	210,780	61,940	23%
23	The Villages	7/10/2018	238,050	202,390	35,660	15%	238,050	202,390	35,660	15%
24	The Villages	8/15/2018	311,410	360,580	-49,170	-16%	311,410	360,580	-49,170	-16%
25	The Villages	8/15/2018	230,550	234,210	-3,660	-2%	230,550	234,210	-3,660	-2%
26	The Villages	8/22/2018	180,450	203,460	-23,010	-13%	180,450	203,460	-23,010	-13%
27	The Villages	8/22/2018	199,670	200,730	-1,060	-1%	199,670	200,730	-1,060	-1%
28	The Villages	8/22/2018	320,260	276,440	43,820	14%	320,260	276,440	43,820	14%
29	The Villages	8/22/2018	211,630	248,260	-36,630	-17%	211,630	248,260	-36,630	-17%
30	The Villages	8/22/2018	255,110	206,220	48,890	19%	255,110	206,220	48,890	19%
31	The Villages	8/22/2018	118,510	203,850	-85,340	-72%				
32	The Villages	8/25/2018	393,900	376,880	17,020	4%	393,900	376,880	17,020	4%
33	The Villages	8/25/2018	292,690	312,990	-20,300	-7%	292,690	312,990	-20,300	-7%
34	The Villages	8/29/2018	220,520	287,890	-67,370	-31%	220,520	287,890	-67,370	-31%
35	The Villages	8/29/2018	305,340	289,120	16,220	5%	305,340	289,120	16,220	5%
36	The Villages	9/5/2018	402,720	334,000	68,720	17%	402,720	334,000	68,720	17%
37	The Villages	9/5/2018	275,510	111,180	164,330	60%				
38	The Villages	9/5/2018	442,070	336,650	105,420	24%	442,070	336,650	105,420	24%
39	The Villages	9/5/2018	259,890	240,150	19,740	8%	259,890	240,150	19,740	8%
40	The Villages	9/25/2018	280,370	350,130	-69,760	-25%	280,370	350,130	-69,760	-25%
41	The Villages	9/25/2018	278,410	267,740	10,670	4%	278,410	267,740	10,670	4%
42	The Villages	9/25/2018	214,840	267,990	-53,150	-25%	214,840	267,990	-53,150	-25%
43	The Villages	9/25/2018	275,790	190,230	85,560	31%	275,790	253,640	22,150	8%
VCCDD - LSSA Subtotals			13,036,910	10,302,570	2,734,340	21%	12,780,613	10,050,950	2,729,663	21%

Count	City	EVALUATION DATE	Unadjusted Data				Adjusted for Partial Data*			
			12-Month Pre-Usage	12-Month Post Usage	Year One Gallons Saved (in thousands)	Year One % Saved	12-Month Pre-Usage	12-Month Post Usage	Year One Gallons Saved (in thousands)	Year One % Saved
NSCUDD - VWCA										
1	The Villages	3/3/2017	389,550	168,240	221,310	57%	389,550	168,240	221,310	57%
2	The Villages	3/3/2017	342,800	288,800	54,000	16%	342,800	315,055	27,745	8%
3	The Villages	3/8/2017	376,680	198,830	177,850	47%	376,680	198,830	177,850	47%
4	The Villages	3/31/2017	608,770	438,420	170,350	28%	608,770	478,276	130,494	21%
5	The Villages	4/7/2017	407,230	111,040	296,190	73%	407,230	136,514	270,716	66%
6	The Villages	4/13/2017	605,360	427,120	178,240	29%	605,360	427,120	178,240	29%
7	The Villages	4/21/2017	373,120	295,360	77,760	21%	373,120	295,360	77,760	21%
8	The Villages	2/1/2018	281,400	267,670	13,730	5%	306,982	267,670	39,312	13%
9	The Villages	2/1/2018	342,160	239,880	102,280	30%	342,160	239,880	102,280	30%
10	The Villages	2/1/2018	344,290	226,280	118,010	34%	344,290	226,280	118,010	34%
11	The Villages	2/9/2018	466,210	65,070	401,140	86%				
12	The Villages	2/9/2018	301,500	185,580	115,920	38%	301,500	185,580	115,920	38%
13	The Villages	2/9/2018	269,890	86,130	183,760	68%	269,890	86,130	183,760	68%
14	The Villages	2/13/2018	321,200	95,880	225,320	70%	321,200	95,880	225,320	70%
15	The Villages	2/13/2018	287,930	262,410	25,520	9%	287,930	262,410	25,520	9%
16	The Villages	3/23/2018	298,240	178,730	119,510	40%	298,240	178,730	119,510	40%
17	The Villages	3/23/2018	344,540	218,550	125,990	37%	344,540	218,550	125,990	37%
18	The Villages	3/23/2018	278,690	219,100	59,590	21%	278,690	219,100	59,590	21%
19	The Villages	4/4/2018	417,100	207,510	209,590	50%	500,520	207,510	293,010	59%
20	The Villages	4/4/2018	344,850	229,580	115,270	33%	344,850	229,580	115,270	33%
21	The Villages	4/4/2018	261,720	200,990	60,730	23%	261,720	200,990	60,730	23%
22	The Villages	4/6/2018	231,290	166,690	64,600	28%	252,316	166,690	85,626	34%
23	The Villages	4/9/2018	282,260	340,860	-58,600	-21%	282,260	340,860	-58,600	-21%
24	The Villages	4/9/2018	299,990	224,030	75,960	25%	327,262	244,396	82,865	25%
25	The Villages	4/12/2018	200,730	97,520	103,210	51%				
26	The Villages	4/12/2018	283,700	227,080	56,620	20%	283,700	227,080	56,620	20%
27	The Villages	4/12/2018	318,150	263,330	54,820	17%	318,150	263,330	54,820	17%
28	The Villages	4/18/2018	297,710	242,140	55,570	19%	297,710	242,140	55,570	19%
29	The Villages	4/18/2018	245,930	182,380	63,550	26%	245,930	182,380	63,550	26%
30	The Villages	4/18/2018	285,700	166,780	118,920	42%	285,700	166,780	118,920	42%
31	The Villages	4/24/2018	265,070	149,730	115,340	44%	265,070	149,730	115,340	44%
32	The Villages	4/24/2018	271,000	219,770	51,230	19%	295,636	219,770	75,866	26%
33	The Villages	4/24/2018	204,510	254,150	-49,640	-24%	204,510	254,150	-49,640	-24%
34	The Villages	4/27/2018	329,660	191,860	137,800	42%	329,660	191,860	137,800	42%
35	The Villages	5/2/2018	210,730	166,380	44,350	21%	229,887	181,505	48,382	21%
36	The Villages	5/2/2018	274,610	196,560	78,050	28%	274,610	196,560	78,050	28%
37	The Villages	5/2/2018	255,910	157,150	98,760	39%	255,910	157,150	98,760	39%
38	The Villages	5/2/2018	168,900	26,040	142,860	85%	168,900	26,040	142,860	85%
39	The Villages	5/7/2018	234,580	271,800	-37,220	-16%	255,905	271,800	-15,895	-6%
40	The Villages	5/7/2018	238,950	223,400	15,550	7%	238,950	223,400	15,550	7%
41	The Villages	5/7/2018	230,440	212,470	17,970	8%	251,389	212,470	38,919	15%
42	The Villages	5/7/2018	299,990	336,480	-36,490	-12%	327,262	507,750	-180,488	-55%
43	The Villages	5/9/2018	300,570	317,780	-17,210	-6%	300,570	317,780	-17,210	-6%
44	The Villages	5/9/2018	263,340	197,830	65,510	25%	428,263	146,430	281,833	66%
45	The Villages	5/9/2018	172,680	40,710	131,970	76%	172,680	40,710	131,970	76%
46	The Villages	5/14/2018	257,440	145,080	112,360	44%	257,440	145,080	112,360	44%
47	The Villages	5/14/2018	228,730	125,720	103,010	45%	228,730	125,720	103,010	45%
48	The Villages	5/14/2018	245,100	165,410	79,690	33%	245,100	165,410	79,690	33%
49	The Villages	5/17/2018	230,260	258,060	-27,800	-12%	230,260	301,596	-71,336	-31%
50	The Villages	5/17/2018	240,310	143,500	96,810	40%	240,310	143,500	96,810	40%
51	The Villages	5/17/2018	206,120	19,210	186,910	91%	206,120	19,210	186,910	91%
52	The Villages	5/17/2018	282,980	301,490	-18,510	-7%	282,980	301,490	-18,510	-7%
53	The Villages	5/23/2018	177,130	198,390	-21,260	-12%	212,556	198,390	14,166	7%
54	The Villages	5/23/2018	266,320	83,080	183,240	69%	266,320	83,080	183,240	69%
55	The Villages	5/23/2018	251,470	134,610	116,860	46%	251,470	134,610	116,860	46%
56	The Villages	6/19/2018	249,560	191,210	58,350	23%	272,247	191,210	81,037	30%
57	The Villages	6/19/2018	290,270	235,280	54,990	19%	290,270	235,280	54,990	19%
58	The Villages	6/19/2018	293,820	168,430	125,390	43%	293,820	168,430	125,390	43%
59	The Villages	6/19/2018	213,730	202,800	10,930	5%	233,160	202,800	30,360	13%
60	The Villages	6/20/2018	294,660	262,480	32,180	11%	294,660	262,480	32,180	11%

Count	City	EVALUATION DATE	Unadjusted Data				Adjusted for Partial Data*			
			12-Month Pre-Usage	12-Month Post Usage	Year One Gallons Saved (in thousands)	Year One % Saved	12-Month Pre-Usage	12-Month Post Usage	Year One Gallons Saved (in thousands)	Year One % Saved
61	The Villages	6/20/2018	261,300	263,600	-2,300	-1%	285,055	263,600	21,455	8%
62	The Villages	6/27/2018	331,870	222,440	109,430	33%	331,870	222,440	109,430	33%
63	The Villages	6/27/2018	327,860	217,120	110,740	34%	327,860	217,120	110,740	34%
64	The Villages	7/2/2018	253,530	292,660	-39,130	-15%	276,578	292,660	-16,082	-6%
65	The Villages	7/2/2018	205,010	38,180	166,830	81%				
66	The Villages	7/3/2018	227,230	342,300	-115,070	-51%	227,230	342,300	-115,070	-51%
67	The Villages	7/3/2018	206,810	212,160	-5,350	-3%	206,810	212,160	-5,350	-3%
68	The Villages	7/10/2018	127,520	77,330	50,190	39%	127,520	77,330	50,190	39%
69	The Villages	7/10/2018	211,850	167,060	44,790	21%	211,850	167,060	44,790	21%
70	The Villages	7/10/2018	237,890	140,950	96,940	41%				
71	The Villages	7/11/2018	303,250	301,080	2,170	1%	303,250	301,080	2,170	1%
72	The Villages	7/11/2018	265,080	172,760	92,320	35%	265,080	172,760	92,320	35%
73	The Villages	7/11/2018	277,000	222,520	54,480	20%	277,000	222,520	54,480	20%
74	The Villages	7/11/2018	156,050	112,720	43,330	28%	156,050	112,720	43,330	28%
75	The Villages	7/11/2018	168,010	144,070	23,940	14%	183,284	144,070	39,214	21%
76	The Villages	7/18/2018	236,700	342,730	-106,030	-45%	236,700	342,730	-106,030	-45%
77	The Villages	7/18/2018	305,440	241,420	64,020	21%	305,440	241,420	64,020	21%
78	The Villages	7/18/2018	226,700	277,260	-50,560	-22%	226,700	277,260	-50,560	-22%
79	The Villages	7/18/2018	253,490	213,500	39,990	16%	253,490	213,500	39,990	16%
80	The Villages	7/18/2018	334,170	221,070	113,100	34%	334,170	221,070	113,100	34%
81	The Villages	7/24/2018	204,180	160,760	43,420	21%	204,180	160,760	43,420	21%
82	The Villages	7/24/2018	231,900	220,010	11,890	5%	231,900	220,010	11,890	5%
83	The Villages	7/24/2018	158,540	311,790	-153,250	-97%	158,540	311,790	-153,250	-97%
84	The Villages	7/24/2018	284,520	268,100	16,420	6%	284,520	268,100	16,420	6%
85	The Villages	7/24/2018	210,750	150,850	59,900	28%	210,750	150,850	59,900	28%
86	The Villages	8/7/2018	213,550	241,850	-28,300	-13%	213,550	241,850	-28,300	-13%
87	The Villages	8/7/2018	261,550	230,700	30,850	12%	261,550	230,700	30,850	12%
88	The Villages	8/7/2018	195,420	138,220	57,200	29%	213,185	138,220	74,965	35%
NSCUDD - VWCA Subtotals			24,234,700	18,064,050	6,170,650	25%	23,717,808	18,012,813	5,704,995	24%
Program Total			**97,342,010**	**71,083,120**	**26,258,890**	**27%**	**94,843,832**	**68,883,770**	**25,960,062**	**27%**

* Accounts adjusted for partial data highlighted in yellow

Appendix F

Summary of Followup Evaluations

Appendix F. Phase 4 N822 Follow-Up Summary

Utility / Count	Evaluation Number	Percent of Changes Implemented
Citrus		
1	11	75
2	14	90
3	19	60
4	20	80
5	21	90
6	22	70
7	24	90
8	28	90
9	30	70
10	33	95
11	43	70
12	45	50
13	47	65
14	48	80
15	54	20
Subtotal		73.0
Hernando		
1	2	80
2	3	95
3	4	85
4	8	50
5	12	80
6	13	90
7	14	75
8	16	75
9	20	55
10	21	50
11	24	90
12	28	80
13	29	95
14	58	70
15	62	75
16	65	95
17	66	90
Subtotal		78.2
Marion		
1	1	85
2	3	80
3	5	90

Utility / Count	Evaluation Number	Percent of Changes Implemented
4	6	90
5	7	90
6	11	60
7	13	60
8	15	10
9	16	100
10	25	90
11	28	85
12	29	90
13	30	70
14	46	90
15	55	90
16	57	90
17	63	60
Subtotal		78.2
VCCDD		
1	12	80
2	13	80
3	14	70
4	15	90
5	16	85
6	18	60
7	20	100
8	23	60
9	24	30
10	33	60
11	39	75
Subtotal		71.8
NSCUDD		
1	1	90
2	2	40
3	3	30
4	4	80
5	5	95
6	8	80
7	9	90
8	10	50
9	12	50
10	13	60
11	17	50
12	18	50
13	26	90

Utility / Count	Evaluation Number	Percent of Changes Implemented
14	29	85
15	43	90
16	44	80
17	58	60
18	59	40
19	60	80
20	63	80
21	86	90
22	88	80
Subtotal		70.0
	Program Total	74.2
	Enhanced Evaluations	76.6
	Core Evaluations	70.6