



Energy Services Guarantee
City of Oakland Park

Oakland Park, Florida
Year 1 - Annual Report
May 2019—April 2020



energysystemsgroup.com

Performance Guarantee Savings Report City of Oakland Park

Year 1

May 2019 – April 2020

April 9, 2020

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Executive Summary

This comprehensive report shows measured and non-measured project benefits for the Automated Water Metering system and related upgrades associated with the performance contract signed November 15, 2017 with a final acceptance signed in April 2019. The purpose of this report is to verify the achieved results of the guaranteed performance based contract.

The “performance” aspect of performance contracting is affected by how benefits are determined. This Measurement and Verification (M&V) report documents the detailed benefits’ calculations and verifies the level of achievement for the benefits as guaranteed by contract.

The Improvement Measures implemented for this project included:

- Installation of cellular based Automated Water Metering system throughout the City to improve accuracy of the system and provide real time meter use data for billing and water leak detection purposes.
- Software Engagement for hosted solution via Badger’s Beacon system.
- Network data collection – Interface with the City’s Tyler Munis system for electronic billing data interface and validation. Meter reading for the new meters will be collected via the Badger’s Beacon System via the cellular transmission, and transmitted to the City’s Tyler Munis system.

These measures enabled the City of Oakland Park to enhance customer service, provide earlier leak detection, increase billable revenue, and reduce operating costs.

ESG began the installation of improvement measures in December 2017 and completed in April 2019. After the first year of operation, ESG verified that the achieved operational cost savings and increased billable revenue for the first year were **\$1,122,151**. The process of demonstrating the results is called the Measurement & Verification (M&V) procedure as is defined in Exhibit B of the signed contract, included in the Appendix of this report.

The Year 1 achieved benefits are **\$295,031** more than the guaranteed benefits. The table on the following page provides a detailed breakdown of the benefits for each measure.

City of Oakland Park Year 1 Annual Report

Table 1-Summary of Benefits

City of Oakland Park, Florida Savings Summary Year 1 - May 2019-April 2020			
Type of Project Benefits	Guaranteed Savings	Year 1 Actual Savings	Excess/Shortfall (\$)
Meter Accuracy Benefits			
Measured Meter Accuracy Benefits (Increased Billable Revenue for 5/8" x 3/4", 1" 1.5" and 2" meters)	\$ 615,221	\$ 901,106	\$ 285,885
Non-Measured Meter Accuracy Benefits (Increased Billable Revenue for 3", 4" and 6" meters)	\$ 19,682	\$ 28,828	\$ 9,146
Non-Measured Agreed Upon Project Benefits			
Operations Efficiencies (Meter Reading)	\$ 114,433	\$ 114,433	\$ -
Capital Cost Avoidance	\$ 77,784	\$ 77,784	\$ -
Totals	\$ 827,120	\$ 1,122,151	\$ 295,031

Utility Rates

The baseline utility rates used to calculate the estimated guaranteed annual benefits are defined in Exhibit B, the Performance Guarantee and Measurement and Verification Plan of the Contract. As defined in Table 4B of Exhibit B, the baseline utility rate escalated 3% annually shall be used throughout the project savings guarantee term to calculate the benefit from the new more efficient meters. The table below outlines the baseline and escalated utility rates used for Guarantee Year 1.

Table 2 –Utility Rates

	Utility Rates		
	Contractual Rate Escalation	Water Usage Rate (\$/1000 Gal)	Sewer Usage Rate (\$/1000 Gal)
Baseline		\$ 7.22	\$ 5.14
Year 1	3%	\$ 7.43	\$ 5.29
Year 2	3%	\$ 7.66	\$ 5.45
Year 3	3%	\$ 7.89	\$ 5.62
Year 4	3%	\$ 8.12	\$ 5.79
Year 5	3%	\$ 8.37	\$ 5.96
Year 6	3%	\$ 8.62	\$ 6.14
Year 7	3%	\$ 8.88	\$ 6.32
Year 8	3%	\$ 9.14	\$ 6.51
Year 9	3%	\$ 9.42	\$ 6.71
Year 10	3%	\$ 9.70	\$ 6.91
Year 11	3%	\$ 9.99	\$ 7.11
Year 12	3%	\$ 10.29	\$ 7.33
Year 13	3%	\$ 10.60	\$ 7.55
Year 14	3%	\$ 10.92	\$ 7.77
Year 15	3%	\$ 11.25	\$ 8.01

Note: Rates shown for Year 1 in bold font were used for the Year 1 savings calculations.

Measurement and Verification Methods

The measurement and verification (M&V) methods discussed in this report are based on the signed contract (November 2017) and specifically as discussed in Exhibit B, Measurement and Verification Plan, included in the Appendix of this report.

Water Meter Accuracy Testing

ESG conducted pre-construction accuracy testing on a randomly selected sample set of water meters within the City. The average accuracy readings for each meter type measured in the City were used to establish the baseline water consumption values for the meters. As shown in Tables 4E and 4F of Exhibit B in the Appendix of this report, the Year 1 Baseline Weighted Average Accuracy based on pre-construction water meter test results was established as 93.9%.

Post-Construction water meter accuracy testing was completed at the end of Year 1. All water meters were tested to AWWA standards and procedures. The Summary of the post measurements taken at the end of Guarantee Year 1 is presented on the following page in Table 4. Exhibit B in the Appendix of this report indicates the calculation methodology for the Weighted Average Accuracy. Table 3 below illustrates the Year 1 Weighted Average Accuracy based on the Year 1 measured accuracies for each meter size.

The Year 1 Weighted Average Accuracy for all meter sizes is 100.6% as shown from the test results and exceeds the 98.5% minimum threshold as noted in Exhibit B. Therefore, the Year 1 Weighted Average Accuracy has exceeded the Guaranteed Accuracy.

Table 3 –Year 1 Weighted Average Accuracy

Oakland Park Florida Year 1 Weighted Average Accuracy			
Meter Size	Quantity Tested	% Water of Baseline Annual Total that flows via this size (Baseline % established in the Table 4G in the contract)	Year 1 Measured Average Accuracy % based on Flow Rate (from Table 4)
5/8" x 3/4"	9	35.2%	100.2%
1"	9	16.0%	101.2%
1.5"	3	11.0%	99.4%
2"	4	34.7%	101.1%
Year 1 Measured Weighted Average Accuracy (all meter sizes)			100.6%
Guaranteed Year 1 Weighted Average Accuracy (all meter sizes)			98.5%

As outlined in Exhibit B, the Year 1 Weighted Average Accuracy is calculated using the percentages shown in the third and fourth columns of Table 3, as follows:

Weighted Average Accuracy = Sumproduct(% Water of Baseline Annual Total and Year 1 Measured Average Accuracy %)/(Sum (% Water of Baseline Annual Total))

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Table 4 – Summary of Year 1 Water Meter Measurements

Oakland Park Florida Year 1 Water Meter Accuracy Test Results												
Test Number	Meter Brand	Meter Type	Meter Number	Final Meter Reading	Meter Size	Min	Low Flow	Low Flow	Inter.	Medium	High	Measured
						15.00%	Rate	Accuracy	70%	Flow Rate	Flow Accuracy	Average Accuracy based on flow rate
1	Badger	E-Series	18567500	190469.8	5/8 x 3/4	0.25	100.60%	2	99.50%	15	99.45%	99.66%
2	Badger	E-Series	18564428	83751.47	5/8 x 3/4	0.25	100.30%	2	100.00%	15	100.65%	100.14%
3	Badger	E-Series	18404908	126681.4	5/8 x 3/4	0.25	98.50%	2	100.90%	15	99.14%	100.28%
4	Badger	E-Series	18567793	43116.6	5/8 x 3/4	0.25	101.90%	2	100.10%	15	100.55%	100.44%
5	Badger	E-Series	18568521	110871.6	5/8 x 3/4	0.25	99.80%	2	100.70%	15	100.91%	100.60%
6	Badger	E-Series	18567371	195278.8	5/8 x 3/4	0.25	100.30%	2	101.40%	15	101.37%	101.23%
7	Badger	E-Series	18566712	111151	5/8 x 3/4	0.25	100.00%	2	100.20%	15	100.29%	100.18%
8	Badger	E-Series	18566491	75312.45	5/8 x 3/4	0.25	99.20%	2	99.40%	15	100.51%	99.54%
9	Badger	E-Series	18567673	60031.02	5/8 x 3/4	0.25	99.60%	2	99.80%	15	100.96%	99.94%
Average												100.22%

Test Number	Meter Brand	Meter Type	Meter Number	Final Meter Reading	Meter Size	Low Flow Rate	Low Flow Accuracy	Medium Flow Rate	Medium Flow Accuracy	High Flow Rate	High Flow Accuracy	Measured Average Accuracy based on flow rate
1	Badger	E-Series	18569370	4355.43	1	0.75	98.60%	4	97.69%	40	99.25%	98.06%
2	Badger	E-Series	18569262	72648.1	1	0.75	98.80%	4	100.10%	40	100.65%	99.99%
3	Badger	E-Series	18565640	60658.28	1	0.75	102.10%	4	103.29%	40	105.12%	103.39%
4	Badger	E-Series	180158897	450062.6	1	0.75	98.70%	4	101.99%	40	101.78%	101.47%
5	Badger	E-Series	18405987	62502.96	1	0.75	98.20%	4	101.50%	40	102.26%	101.12%
6	Badger	E-Series	18568135	458.13	1	0.75	99.60%	4	102.39%	40	103.30%	102.11%
7	Badger	E-Series	18568208	230079.6	1	0.75	98.40%	4	101.79%	40	102.22%	101.35%
8	Badger	E-Series	18569434	715641.3	1	0.75	100.40%	4	102.00%	40	102.93%	101.90%
9	Badger	E-Series	18568205	593575.5	1	0.75	100.10%	4	101.40%	40	101.59%	101.23%
Average												101.18%

Test Number	Meter Brand	Meter Type	Meter Number	Final Meter Reading	Meter Size	Low Flow Rate	Low Flow Accuracy	Medium Flow Rate	Medium Flow Accuracy	High Flow Rate	High Flow Accuracy	Measured Average Accuracy based on flow rate
1	Badger	E-Series	18335106	341628.1	1.5	1.5	98.33%	8	99.14%	50	99.42%	99.06%
2	Badger	E-Series	18406142	3192032	1.5	1.5	99.33%	8	99.74%	50	99.62%	99.66%
3	Badger	E-Series	18406120	34105.6	1.5	1.5	97.93%	8	99.64%	50	100.22%	99.47%
Average												99.40%

Test Number	Meter Brand	Meter Type	Meter Number	Final Meter Reading	Meter Size	Low Flow Rate	Low Flow Accuracy	Medium Flow Rate	Medium Flow Accuracy	High Flow Rate	High Flow Accuracy	Measured Average Accuracy based on flow rate
1	Badger	E-Series	18335306	269524.9	2	2	100.24%	15	100.81%	100	100.77%	100.72%
2	Badger	E-Series	18335337	1244691	2	2	101.44%	15	102.00%	100	101.96%	101.91%
3	Badger	E-Series	18430251	930246.2	2	2	99.94%	15	100.61%	100	100.27%	100.46%
4	Badger	E-Series	18335441	1159075	2	2	101.24%	15	101.30%	100	101.76%	101.36%
Average												101.11%

Table 5 – Summary of Year 1 Increased Billable Volume and Revenue

Oakland Park Florida Year 1 Increased Billable Volume and Revenue						
Meter Size	% Water of Baseline Annual Total that flows via this size (Baseline % established in the Table 4G in the contract)	Year 1 Increased Billable Volume		Year 1 Increased Revenue		
		Increased Billable Volume Water (kGal)	Increased Billable Volume Sewer (kGal)	Increased Water Revenue \$	Increased Sewer Revenue \$	Total Increased Revenue \$
5/8" x 3/4"	35.2%	27,659	23,030	\$ 205,506	\$ 121,831	\$ 901,106
1"	16.0%	12,572	10,468	\$ 93,412	\$ 55,378	
1.5"	11.0%	8,643	7,197	\$ 64,221	\$ 38,072	
2"	34.7%	27,266	22,703	\$ 202,587	\$ 120,100	
3", 4", 6"	3.1%	2,436	2,028	\$ 18,099	\$ 10,729	\$ 28,828
All	100.0%	78,577	65,427	\$ 583,825	\$ 346,109	\$ 929,934

Table 5 above summarizes the Year 1 Increased Billable Volume and Revenue based on the Year 1 water meter test results and Baseline Billable Water and Sewer Usage. As outlined in Exhibit B, the post-retrofit measured weighted average accuracy of the 2" and smaller meters will be utilized to calculate savings associated with the 3", 4" and 6" meters during the Guarantee Term.

Table 6 below outlines the Baseline Billable Water and Sewer Usage, as established in Exhibit B, and as used in the calculation of Increased Billable Volume.

Table 6 – Baseline Billable Water and Sewer Usage

Baseline Billable Water and Sewer Usage	
Water (kGal billed)	1,101,246
Sewer (kGal billed)	916,956

As outlined in Exhibit B, the water and sewer billable volume increase and revenue increase are calculated as follows:

Increased Billable Volume (Water kGal) = Baseline Water Billed (kGal) x (Actual Post-Retrofit Measured Weighted Average Accuracy / Baseline Water Meter Accuracy) – Baseline Water Billed (kGal)

$$78,577 \text{ kGal} = 1,101,246 \text{ kGal} \times (100.6\% / 93.9\%) - 1,101,246 \text{ kGal}$$

Increased Billable Volume (Sewer kGal) = Baseline Sewer Billed (kGal) x (Actual Post-Retrofit Measured Weighted Average Accuracy / Baseline Water Meter Accuracy) – Baseline Sewer Billed (kGal)

$$65,427 \text{ kGal} = 916,956 \text{ kGal} \times (100.6\% / 93.9\%) - 916,956 \text{ kGal}$$

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Increased Water Revenue \$ = Increased Billable Volume (Water kGal) x Baseline Escalated Water Usage Rate (\$/kGal)

$$\$583,825 = 78,577 \text{ kGal} \times \$7.43 / \text{kGal}$$

Increased Sewer Revenue \$ = Increased Billable Volume (Sewer kGal) x Baseline Escalated Sewer Usage Rate (\$/kGal)

$$\$346,109 = 65,427 \text{ kGal} \times \$5.29 / \text{kGal}$$

Operational Savings

The Operational Avoided Future and Replacement Cost Savings presented in the savings report have been reviewed and agreed by both parties in the contract and are deemed satisfied. For additional details on the Agreed Upon Operational Savings, refer to Table 5B of Exhibit B shown below, and Appendix B1 of the contract included in the Appendix of this report.

	Existing Meter Readers Cost Avoidance			Meter Repair & Replacement Cost Reduction	New Handheld Devices	
Contract Year	Labor Efficiency (Operations Efficiency)	Vehicle Maintenance (Operations Efficiency)	Truck Replacement (Operations Efficiency)	Material (Capital Cost Avoidance)	New / Replacement Cost (Operations Efficiency)	Total Operational Savings
Install	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1	\$ 98,056	\$ 16,377	\$ -	\$ 77,784	\$ -	\$ 192,217
2	\$ 100,998	\$ 16,868	\$ -	\$ 80,118	\$ 10,234	\$ 208,218
3	\$ 104,028	\$ 17,374	\$ 40,000	\$ 82,521	\$ -	\$ 243,923
4	\$ 107,148	\$ 17,896	\$ -	\$ 84,997	\$ -	\$ 210,041
5	\$ 110,363	\$ 18,432	\$ -	\$ 87,547	\$ -	\$ 216,342
6	\$ 113,674	\$ 18,985	\$ -	\$ 90,173	\$ -	\$ 222,832
7	\$ 117,084	\$ 19,555	\$ -	\$ 92,878	\$ -	\$ 229,517
8	\$ 120,597	\$ 20,142	\$ -	\$ 95,665	\$ 12,587	\$ 248,989
9	\$ 124,214	\$ 20,746	\$ 47,762	\$ 98,534	\$ -	\$ 291,257
10	\$ 127,941	\$ 21,368	\$ -	\$ 101,490	\$ -	\$ 250,800
11	\$ 131,779	\$ 22,009	\$ -	\$ 94,082	\$ -	\$ 247,870
12	\$ 135,732	\$ 22,670	\$ -	\$ 87,214	\$ -	\$ 245,616
13	\$ 139,804	\$ 23,350	\$ -	\$ 80,847	\$ -	\$ 244,001
14	\$ 143,999	\$ 24,050	\$ -	\$ 74,945	\$ -	\$ 242,994
15	\$ 148,318	\$ 24,772	\$ 57,030	\$ 69,474	\$ 15,480	\$ 315,075
TOTAL	\$ 1,823,735	\$ 304,594	\$ 144,793	\$ 1,298,268	\$ 38,301	\$ 3,609,691

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Energy Systems Group verifies the accuracy of this report and City of Oakland Park accepts the findings of this report. Both parties consider the matter of Year 1 Measurement & Verification requirements met and complete.

Accepted

Kishore S Prabhu

Kishore Prabhu, PE
Performance Engineer

4/9/2020

Date

Mary Joy

Mary Joy, CMVP, EMIT
Measurement & Verification Analyst

April 9, 2020

Date

Certificate of Acceptance

Your signature below acknowledges receipt of, and acceptance of Energy Systems Group's Year 1 – Annual Energy Guarantee Report for the performance contract between the City of Oakland Park and Energy Systems Group, LLC signed November 2017 and satisfactorily completed in April 2019. Please sign and return a copy to Energy Systems Group to be kept with the original copy. The fax number is (833) 834-0321. Customer's acceptance becomes automatic if signed Certificate of Acceptance is not returned within 30 days of receipt of the report.

City of Oakland Park Representative:

Name

Title

Signature

Date

Savings Guarantee

Sum of the Project Benefits

	METER ACCURACY BENEFITS		NON MEASURED PROJECT BENEFITS		
PERIOD	MEASURED (a)	NON- MEASURED (b)	OPERATIONS EFFICIENCIES (c)	CAPITAL COST AVOIDANCE (d)	TOTAL
CONSTRUCTION	\$ -		\$ -	\$ -	\$ -
1	\$ 615,221	\$ 19,682	\$ 114,433	\$ 77,784	\$ 827,120
2	\$ 635,215	\$ 20,322	\$ 128,100	\$ 80,118	\$ 863,755
3	\$ 655,860	\$ 20,982	\$ 161,402	\$ 82,521	\$ 920,765
4	\$ 677,175	\$ 21,664	\$ 125,044	\$ 84,997	\$ 908,880
5	\$ 699,184	\$ 22,368	\$ 128,795	\$ 87,547	\$ 937,894
6	\$ 720,159	\$ 23,039	\$ 132,659	\$ 90,173	\$ 966,030
7	\$ 741,764	\$ 23,730	\$ 136,639	\$ 92,878	\$ 995,011
8	\$ 764,017	\$ 24,442	\$ 153,325	\$ 95,665	\$ 1,037,448
9	\$ 786,937	\$ 25,175	\$ 192,722	\$ 98,534	\$ 1,103,370
10	\$ 810,545	\$ 25,931	\$ 149,309	\$ 101,490	\$ 1,087,276
11	\$ 834,862	\$ 26,709	\$ 153,788	\$ 94,082	\$ 1,109,441
12	\$ 859,908	\$ 27,510	\$ 158,402	\$ 87,214	\$ 1,133,033
13	\$ 885,705	\$ 28,335	\$ 163,154	\$ 80,847	\$ 1,158,041
14	\$ 912,276	\$ 29,185	\$ 168,049	\$ 74,945	\$ 1,184,455
15	\$ 939,644	\$ 30,061	\$ 245,601	\$ 69,474	\$ 1,284,780
TOTALS	\$ 11,538,473	\$ 369,136	\$ 2,311,423	\$ 1,298,268	\$ 15,517,300

Appendix

Exhibit B- Measurement and Verification Plan

EXHIBIT B
PERFORMANCE GUARANTEE AND MEASUREMENT AND VERIFICATION PLAN

Measurement and Verification (M&V) is required to verify the achievement of energy savings and meter accuracy benefits as required for the project. Properly applied M&V accurately assesses energy savings, allocates risks to the appropriate parties, reduces uncertainties to reasonable levels, monitors equipment performance, finds additional savings, improves operations and maintenance, verifies that the savings are met, and allows for future adjustments as needed.

This M&V plan is prepared by ESG to help both parties agree on the methodologies to justify savings for energy conservation measures covered in the project. This M&V plan specifies the approach to monitor the actual energy savings associated with the project, provides sample energy savings calculation documents, and describes the methodology, measurement, and monitoring format of actual energy savings.

1.0 DEFINITIONS

When used in this Agreement, the following words in bold font shall have the meanings ascribed to them below:

"Acceptance of Installation" means an authorized representative of the CITY has inspected and accepted that ESG installed Improvement Measures are operational and comply with contract performance requirements and specifications. The CITY'S acceptance shall not relieve ESG from responsibility for continued compliance with contract requirements during the contract term. The Acceptance of Installation shall occur after Substantial Completion.

"Annual Project Benefits" is defined as the portion of the Guaranteed Measured Project Benefits to be achieved in any one Guarantee Year of the performance Guarantee Term.

"Annual Project Benefits Realized" are the Project Benefits actually realized for any one year of the Performance Guarantee Term.

"Annual Project Benefits Shortfall" are the amount by which the Annual Project Benefits exceed the Annual Project Benefits Realized in any one year of the Performance Guarantee Term.

"Annual Project Benefits Surplus" are the amount by which the Annual Project Benefits Realized exceed the Annual Project Benefits in any one year of the Performance Guarantee Term.

"Approval" means the CITY has completed review of submittals, deliverables or administrative documents (e.g., insurance certificates, installation schedules, planned CITY interruptions, etc.) and has determined that the documents conform to contract requirements. The CITY's approval shall not relieve ESG from responsibility for complying with contract requirements.

"Baseline" is the mutually agreed upon data and/or water usage amounts that reflect conditions prior to the installation of the Improvement Measures comprising the Project as detailed in this contract.

"Baseline Period" The Baseline for the Water Meter portion of the project is the calendar year 2016.

"Construction Period" is the period of time beginning with commencement of ESG's performance of the Work and ending the day prior to the first day of the First Guarantee Year.

"Energy Baseline" shall be the energy consumption and costs prior to the installation of the energy conservation measures at the facilities. The baseline will consist of all base year energy bills applicable to the meters in the project. It may also consist of any estimated usage for unmetered energy consumption.

"Energy Conservation Measure (ECM)" is defined as the installation of new equipment/facilities, modification and/or alteration of existing equipment/facilities or rate structures or revised operations and maintenance procedures intended to reduce energy consumption of facilities/energy systems, improve equipment efficiency or provide equipment that complies with existing standards.

"Energy and Operational Savings" or "Energy and Operational Cost Savings" is the sum of the Energy Savings and Operational Savings as defined herein. Such term(s) shall be read consistently with the term "Energy, water, or wastewater cost savings," as defined within FLA ST § 489.145(3)(c).

"Energy Costs" shall mean charges for fuel adjustments, base services, transmission, tariffs, and distributions. The Energy Costs will normally be derived or imputed from the facility's utility bills. This method allows for updating savings calculations with changing rate schedules. In the event of a utility rate decrease, the utility rate(s) used to assign dollar cost will not drop below that of the escalated Baseline Period.

"Energy Savings" means a measurable reduction in Energy Costs and includes, but is not limited to, water meter accuracy benefits.

"Facilities" shall mean those buildings, utility systems, and mechanical equipment from which the water meter accuracy and other savings will be realized.

"Final Acceptance Date" shall mean the date all Improvement Measures comprising the Project (as defined in the Agreement) have been delivered, installed, and accepted by the CITY.

"First Guarantee Year" is defined as the period beginning on the first (1st) day of the month following the Final Acceptance Date and ending on the day prior to the first (1st) anniversary thereof.

"Guarantee Period" or "Guarantee Term" is defined as the period beginning on the first (1st) day of the First Guarantee Year and ending on the last day of the Term.

"Guarantee Year" is defined as each of the successive twelve (12) month periods commencing on the anniversary of the commencement of the First Guarantee Year throughout the Term of this Agreement.

"Guaranteed Savings" or ESG's "Performance Guarantee" is defined as the sum of all Energy and Operational Cost Savings.

"Improvement Measure" is defined as the installation of new equipment/facilities/water meters/technology, modification and/or alteration of existing equipment, facilities or rate structures or revised operations and maintenance procedures intended to improve water meter accuracy, or provide new equipment that complies with existing standards.

"Measured Project Benefits" are certain water meter accuracy benefits calculated in accordance with the methodologies detailed in the Performance Guarantee sections 4.0.

"Non-Measured Project Benefits" have been "mutually agreed to" by City and will be deemed achieved in accordance with the Sum of Project Benefits Table 3A. The City and ESG agree that the Non-Measured Project

Benefits may include, but are not limited to large water meter accuracy benefits, operational savings, and avoided future capital costs as a result of the project implementation. The Non-Measured Project Benefits shall not be measured by ESG at any time during the Support Services and Guarantee Term, but rather ESG's duty to deliver such benefits shall be considered fully satisfied upon the City's Final Acceptance of the Project.

"Operational Costs" shall include the "mutually agreed to" costs associated with operating and maintaining the facilities or servicing water meters. Operational Cost Savings shall not be measured or monitored by ESG at any time during the Support Services and Guarantee Term, but rather shall be considered fully satisfied upon the City's Final Acceptance of the Project. Examples include the cost of inside and outside labor to repair and maintain systems and equipment, the cost of replacement parts, the cost of deferred maintenance, the cost of lamp and ballast disposal, and the cost of new capital equipment.

"Operational Savings" means a measurable reduction in Operational Costs, including identified capital savings. Operational Savings are stipulated based upon information supplied by the City and/or its utility service provider and parties' discussions with respect to reasonable predictions of future costs during the Guarantee Term.

"Project Benefits" are the Measured Project Benefits plus the Non-Measured Project Benefits to be achieved during the term of this agreement.

"Performance Guarantee Term" or **"Guarantee Term"** shall commence on the first day of the first month following the Final Acceptance Date and continue for fifteen (15) years.

"Retrofit Isolation Method" (if applicable to this Project) refers to energy audit methodologies that require pre-retrofit and post-retrofit measurements to isolate energy consumption and costs of specific facility equipment and systems impacted exclusively by this Agreement.

"Support Services Agreement Term" shall commence on the one-year anniversary of the Final Acceptance Date and continue annually until terminated by the City as outlined in the Support Services Agreement (Exhibit C).

"Term" shall be 15 years.

"Total Guarantee Year Savings" is defined as the amount of Energy and Operational Savings realized by Facilities in each Guarantee Year as a result of the Work.

"Total Project Benefits" is defined as the total amount of Measured Project Benefits (Meter Accuracy Benefits) plus the Non-Measured Project Benefits (Operational Savings and Avoided Future Cost Savings) realized over the 15-year term by the City as a result of the project implementation.

"Water Meter Accuracy Baseline" has been initially established by physical removal and certified independent testing of existing water meters, and incorporates normal wear and tear criteria. City and ESG stipulate and agree the test results provided by a third party are accurate and were in accordance with AWWA water meter testing standards and further agree to the baseline used to calculate increased billable water usage to be achieved by City.

"Water Meter Accuracy Benefits" are defined as the increased billable water usage/volume attributable to the implementation of the new, more accurate, water meters.

Water Meter Upgrade Section

SECTIONS 2 THROUGH 5 PERTAIN TO MEASURE - EF-1 – Water Meter Upgrade

2.0 PERFORMANCE GUARANTEE TERM AND TERMINATION

The Term of this Performance Guarantee shall commence on the first (1st) day of the first month following the Final Acceptance Date of the Work installed pursuant to this Agreement. The Performance Guarantee Term is fifteen (15) years, with support services provided annually unless terminated by the City as outlined in the Support Services Agreement (Exhibit C).

3.0 PERFORMANCE GUARANTEE

ESG guarantees to the City Measured Project Benefits will be realized in each Guarantee Year as shown in Table 3A - Sum of Project Benefits. Non-Measured Project Benefits will be considered fully satisfied at Final Acceptance of the Project.

Table 3A - Sum of the Project Benefits

PERIOD	METER ACCURACY BENEFITS		NON MEASURED PROJECT BENEFITS		TOTAL
	MEASURED (a)	NON-MEASURED (b)	OPERATIONS EFFICIENCIES (c)	CAPITAL COST AVOIDANCE (d)	
CONSTRUCTION	\$ -		\$ -	\$ -	\$ -
1	\$ 615,221	\$ 19,682	\$ 114,433	\$ 77,784	\$ 827,120
2	\$ 635,215	\$ 20,322	\$ 128,100	\$ 80,118	\$ 863,755
3	\$ 655,860	\$ 20,982	\$ 161,402	\$ 82,521	\$ 920,765
4	\$ 677,175	\$ 21,664	\$ 125,044	\$ 84,997	\$ 908,880
5	\$ 699,184	\$ 22,368	\$ 128,795	\$ 87,547	\$ 937,894
6	\$ 720,159	\$ 23,039	\$ 132,659	\$ 90,173	\$ 966,030
7	\$ 741,764	\$ 23,730	\$ 136,639	\$ 92,878	\$ 995,011
8	\$ 764,017	\$ 24,442	\$ 153,325	\$ 95,665	\$ 1,037,448
9	\$ 786,937	\$ 25,175	\$ 192,722	\$ 98,534	\$ 1,103,370
10	\$ 810,545	\$ 25,931	\$ 149,309	\$ 101,490	\$ 1,087,276
11	\$ 834,862	\$ 26,709	\$ 153,788	\$ 94,082	\$ 1,109,441
12	\$ 859,908	\$ 27,510	\$ 158,402	\$ 87,214	\$ 1,133,033
13	\$ 885,705	\$ 28,335	\$ 163,154	\$ 80,847	\$ 1,158,041
14	\$ 912,276	\$ 29,185	\$ 168,049	\$ 74,945	\$ 1,184,455
15	\$ 939,644	\$ 30,061	\$ 245,601	\$ 69,474	\$ 1,284,780
TOTALS	\$11,538,473	\$ 369,136	\$ 2,311,423	\$1,298,268	\$15,517,300

- (a) Column A: These values are calculated utilizing the mutually agreed upon Measured Water Meter Accuracy Baseline for the 5/8", 3/4", 1", 1.5", and 2" meters. See Section 4.0. Additional explanation found below.
- (b) Column B: These values are calculated utilizing the mutually agreed upon Water Meter Accuracy Baseline for the 3", 4", and 6" meters. See Section 4.0. Additional explanation found below.
- (c) Column C: These Operational Cost Savings values are based on additional Non-Measured Project Benefits associated with Meter Reading fully discussed and agreed upon between City and ESG. See Section 5.2.
- (d) Column D: These Operational Cost Savings values (specifically, stipulated capital savings) are based on additional Non-Measured Project Benefits fully discussed and agreed upon between City and ESG. See Section 5.2.

* Columns A and B assume an annualized inflation escalation rate of 3%, plus meter degradation factored in as described in section 4.1.3 and table 4F . Column C includes an annual inflation escalation rate of 3%, with a 10% decrease year over year for Guarantee Years 11 through 15. Inflation escalation rates were discussed by and between the parties and are based their mutual agreement.

** Water Meter Accuracy benefits will result in increased billable water usage/volume which logically yields some level of additional billable water revenue. There are many variables beyond ESG's control which may impact the results. Many of these variables are under the control of the City. Others, such as weather and demographics, are mutually uncontrollable variables. Within the context of the benefits projection, any variables not expressly assumed herein may warrant an adjustment to the Baseline.

3.1 Additional Project Savings and Benefits.

ESG may identify additional Project Benefits or Savings opportunities during the Construction Period or during any Performance Guarantee Year. Additional Savings and Benefits that can be demonstrated as a result of ESG efforts that result in no additional costs to the City beyond the costs identified in this Agreement may be credited towards achievement of the Performance Guarantee.

3.2 Project Savings and Benefits Prior during Construction Period

All Additional Savings and Benefits realized by the City that result from activities undertaken by ESG during the Construction Period as a direct result of the installed improvement Measures provided by ESG will be applied toward the overall Performance Guarantee.

3.3 Performance Guarantee.

The performance guarantee will be provided per the descriptions found in the following sections:

4.0 WATER METER ACCURACY BENEFITS

Support Services for Water Meter Accuracy Benefits will be provided as a component of the Support Services Agreement (Refer to Exhibit C). These Support Services will include:

- Executive Overview of the Project's Performance and Measured Project Benefits achieved to date.
- Testing of a Mutually Agreed Upon Representative Sample of Water Meters.
- Summary of the Measured Project Benefits accounting and calculations.

Within ninety (90) days following the anniversary of beginning of the First Guarantee Year, ESG will conduct Support Services for the post-retrofit Water Meter Accuracy Benefits associated with this Project. Such services shall continue on an annual basis throughout Guarantee Term unless terminated by the City as outlined in the Support Services Agreement (Exhibit C).

Water Meter Accuracy Benefits will begin to accrue following Final Acceptance of the water meter replacement portion of the performance based project. There is no expected substantial meter accuracy degradation of new meters installed by ESG for the first twenty (20) years the meters are in service. The meter manufacturer, however, only provides a 98.5% accuracy guarantee of new meters. The 5/8", 3/4" and 1" meters have an accuracy guarantee by the City's selected manufacturer for 20 years. The 1.5" and 2" meters have accuracy guarantee for 5 years. As a result, ESG bases its Measured Water Meter Accuracy Benefits and guarantee calculations on the new meter accuracy based on these conditions.

The City will cooperate with ESG in providing Support Services by authorizing ESG access to the City's relevant accounting records and facilities to monitor any installed equipment relating to such Measured Water Meter Accuracy Benefits pertaining to the Performance Guarantee. In the event that ESG is not provided immediate access to the relevant data from the City, ESG will contact a representative from the City to obtain this information. If there is a delay in receiving the information the ninety (90) day period will be reasonably extended to gain necessary access.

4.1 Water Meter Accuracy Benefits Methodology.

Water/sewer revenue is billed by metered water usage. Any applicable sewer charges are based on water consumption. If a water meter is not 100% accurate, all of the delivered water is not billed to the consumer by the City. As meters age over time, they become less accurate, thus creating an increasing percentage of unbilled water volume. By replacing the meters with new, more accurate models, the volume of water is more precisely measured, and consequently, billing is more precise. Additional operational savings and enhanced customer service capabilities are realized by utilizing automated reading features.

Based upon ESG's and City's investigation of the existing condition of certain City's water meters, City has concluded that a significant percentage of such water meters do not accurately measure billable consumption, and the City is losing potential billable consumption revenue due to this inaccuracy. By replacing inaccurate water meters with more accurate meters, it is expected that City will increase the volume of water registered by such meters and thereby increase measured billable consumption, assuming the same consumption levels prior to and after the Work has been performed. City recognizes, however, that actual revenues may differ from billable

revenues and that the amount of actual revenues achieved in future periods will depend on other factors besides improved meter accuracy such as, by way of example, collections ratio, consumption, and utility rates, among others.

The pre-retrofit accuracy of the 5/8" X 3/4", 1", 1.5", and 2" meter sizes has been calculated by testing a representative sample of the population and establishing the average accuracy of the meter population set forth in the Scope of Work. This calculated pre-retrofit accuracy has been applied to the larger meters (3", 4", and 6").

- 4.1.1 Baseline. The rates used for calculating increased billable water volume are the established Baseline Water/Sewer Rates, shown below in Table 4B-A, plus the agreed upon escalation rate of 3% annually. This rate will be used throughout the project savings guarantee term to calculate the benefit from the new more efficient meters.

Table 4B - Baseline Water / Sewer Usage Rates

Rate	\$/kGal (1000 Gal) (Weighted Average over all Service Sizes)
Water	\$7.2182
Sewer	\$5.14

Table 4B-A Water/Sewer Usage Rates over the term of the Guarantee

Rates Used in Benefits Calculation/Baseline Usage Rate	
Usage Rate Water (\$/1000 Gal)	\$ 7.22
Usage Rate Sewer (\$/1000 Gal)	\$ 5.14

Usage Rates during Measurement and Verification Gaurantee Term			
	Projected Rate Increase	\$/1000 Gal - Water	\$/1000 Gal - Sewer
Implementation Phase	NA	\$ 7.22	\$ 5.14
Yr-1	3%	\$ 7.43	\$ 5.29
Yr-2	3%	\$ 7.66	\$ 5.45
Yr-3	3%	\$ 7.89	\$ 5.62
Yr-4	3%	\$ 8.12	\$ 5.79
Yr-5	3%	\$ 8.37	\$ 5.96
Yr-6	3%	\$ 8.62	\$ 6.14
Yr-7	3%	\$ 8.88	\$ 6.32
Yr-8	3%	\$ 9.14	\$ 6.51
Yr-9	3%	\$ 9.42	\$ 6.71
Yr-10	3%	\$ 9.70	\$ 6.91
Yr-11	3%	\$ 9.99	\$ 7.11
Yr-12	3%	\$ 10.29	\$ 7.33
Yr-13	3%	\$ 10.60	\$ 7.55
Yr-14	3%	\$ 10.92	\$ 7.77
Yr-15	3%	\$ 11.25	\$ 8.01

The following baseline of billable water usage was established based on information provided by the City to ESG. The City and ESG fully discussed and agreed to the following baseline of billable water usage. This data is shown below in Tables 4C - Baseline of Billable Water and Sewer Usage.

Table 4C - Baseline of Billable Water and Sewer Usage

	2016
Water (kGal Billed)	1,101,246
Sewer (kGal Billed)	916,956

- 4.1.2 Adjustments. Many factors determine actual water usage, such as; weather, local economy, population shifts, etc. ESG and the City have agreed on a Baseline Water Usage to calculate the financial benefit to the City.
- 4.1.3 Water Meter Test Results: The water accuracy model includes pre-replacement accuracy results for 5/8" x 3/4", 1", 1.5", and 2" size meters and is applied to the entire meter replacement population. Larger meters (3", 4" and 6") have not been included in testing due to the small number of larger size meters (16 total) that are present in the meter population, and also since these meters represent a very small percentage of the total water billed in the system.

The following table reflects the individual meter accuracy test results of our randomly selected and customer approved test batch.

Table 4D - AWWA Standard Test Results

0.625" x 0.75" Positive Displacement Meter

Ref #	Manufacturer	Serial #	Reading (kgal)	Minimum Flow		Intermediate Flow		High Flow		Weighted Average Accuracy (%)
				Rate (gpm)	Accuracy (%)	Rate (gpm)	Accuracy (%)	Rate (gpm)	Accuracy (%)	
1	Badger	16273759	399223.9	0.25	99.40%	2	100.50%	15	99.23%	100.1%
2	Badger	35610180	1020355	0.25	99.40%	2	101.49%	15	100.23%	101.0%
3	Badger	36404279	600350.6	0.25	97.39%	2	101.49%	15	99.83%	100.6%
4	Badger	32717905	105256.1	0.25	97.39%	2	100.50%	15	99.73%	99.9%
5	Badger	35842725	524626.7	0.25	99.40%	2	99.50%	15	99.63%	99.5%
6	Badger	36217153	352328.7	0.25	99.40%	2	100.50%	15	99.93%	100.2%
7	Badger	29012895	1488339.9	0.25	93.37%	2	98.51%	15	96.63%	97.5%
8	Badger	19176341	739815.2	0.25	99.40%	2	100.50%	15	99.63%	100.2%
9	Badger	16630316	1000506.5	0.25	99.40%	2	100.50%	15	99.33%	100.2%
10	Badger	99849965	1844051.1	0.25	99.40%	2	100.50%	15	99.53%	100.2%
11	Badger	16225945	637347.7	0.25	98.39%	2	100.50%	15	99.39%	100.0%
12	Badger	15932834	1.2	0.25	0.00%	2	0.00%	15	0.00%	0.0%
13	Badger	32717863	454059.8	0.25	99.40%	2	100.50%	15	99.79%	100.2%
14	Badger	14691757	61456.8	0.25	0.00%	2	100.50%	15	99.79%	85.3%
15	Badger	15676638	1079284.2	0.25	98.39%	2	100.50%	15	99.59%	100.0%
16	Badger	32074280	1010040.9	0.25	98.39%	2	101.49%	15	99.69%	100.8%
17	Badger	32762253	1002359.4	0.25	90.36%	2	100.50%	15	100.09%	98.9%
18	Badger	16630376	1009780.8	0.25	99.40%	2	101.49%	15	100.09%	101.0%
19	Badger	16479388	1004877.2	0.25	1.00%	2	1.99%	15	99.99%	16.5%
20	Badger	99143639	1004979.3	0.25	1.00%	2	100.50%	15	98.89%	85.3%
21	Badger	15676705	2631601	0.25	0.00%	2	0.00%	15	3.90%	0.6%
22	Badger	10417741	311805.7	0.25	96.58%	2	100.60%	15	99.33%	99.8%
23	Badger	32718095	481382.4	0.25	97.59%	2	101.59%	15	100.13%	100.8%
24	Badger	97553371	999434.2	0.25	99.60%	2	100.60%	15	100.53%	100.4%
25	Badger	32385571	1159812.2	0.25	95.57%	2	99.60%	15	98.93%	98.9%
26	Badger	40413999	442189.2	0.25	97.59%	2	100.60%	15	99.53%	100.0%
27	Badger	32213812	1021747.1	0.25	96.58%	2	99.60%	15	99.33%	99.1%
28	Badger	18807805	999407.4	0.25	97.59%	2	100.60%	15	99.63%	100.0%
29	Badger	29426217	660583.9	0.25	0.00%	2	100.60%	15	99.93%	85.4%
30	Badger	12539202	217857.2	0.25	96.58%	2	100.60%	15	99.93%	99.9%
31	Badger	13685362	246828.3	0.25	100.50%	2	101.49%	15	99.60%	101.1%
32	Badger	18052898	680614.6	0.25	95.48%	2	98.51%	15	97.20%	97.9%
33	Badger	36626031	326808.9	0.25	99.50%	2	100.50%	15	100.00%	100.3%
34	Badger	29699379	561577.4	0.25	99.50%	2	101.49%	15	100.30%	101.0%
35	Badger	1274658	310954.2	0.25	97.49%	2	99.50%	15	98.60%	99.1%
36	Badger	1251881	1518690.7	0.25	100.50%	2	100.50%	15	100.20%	100.5%
37	Badger	201702161	3630468	0.25	0.00%	2	1.00%	15	88.60%	14.0%
38	Badger	201702162	5764467.3	0.25	59.30%	2	94.53%	15	96.70%	89.6%

1" Positive Displacement Meter

1	Badger	35844500	1475485.7	0.75	98.00%	4	101.09%	40	99.49%	100.4%
2	Badger	32719482	739770.9	0.75	96.00%	4	101.09%	40	99.89%	100.1%
3	Badger	98094392	1478143.6	0.75	94.00%	4	101.09%	40	99.69%	99.8%
4	Badger	35844498	355888.6	0.75	99.00%	4	100.10%	40	99.49%	99.8%
5	Badger	19043543	1662141.2	0.75	99.00%	4	100.10%	40	99.49%	99.8%
6	Badger	19263102	1530562.2	0.75	85.00%	4	99.11%	40	99.49%	97.1%
7	Badger	32362411	1109817.5	0.75	99.00%	4	99.11%	40	99.89%	99.2%
8	Badger	99865001	1467062	0.75	95.10%	4	100.60%	40	99.33%	99.6%
9	Badger	17358383	1492304.4	0.75	10.01%	4	100.60%	40	100.33%	87.0%
10	Badger	201702171	2779959	0.75	0.00%	4	97.61%	40	99.73%	83.3%
11	Badger	35726870	868885.4	0.75	92.09%	4	100.60%	40	99.03%	99.1%
12	Badger	16787661	21405.6	0.75	97.10%	4	100.60%	40	99.73%	99.9%
13	Badger	36217114	266063.2	0.75	96.10%	4	100.60%	40	99.63%	99.8%
14	Neptune	35855093	2687756.6	0.75	100.10%	4	101.59%	40	100.83%	101.3%
15	Badger	15170734	60434.8	0.75	98.90%	4	99.90%	40	99.83%	99.7%
16	Badger	19263113	1319157.4	0.75	99.90%	4	100.90%	40	99.23%	100.5%
17	Badger	17104713	1521743.7	0.75	98.90%	4	101.90%	40	99.93%	101.2%
18	Badger	19535956	2027654.1	0.75	98.90%	4	100.90%	40	99.23%	100.3%
19	Badger	15170708	227283.7	0.75	98.90%	4	99.90%	40	99.73%	99.7%
20	Badger	12085964	1572535.9	0.75	96.90%	4	99.90%	40	99.63%	99.4%
21	Neptune	31440132	4608528	0.75	96.90%	4	99.90%	40	97.13%	99.0%
22	Badger	15170716	480737.1	0.75	99.00%	4	100.00%	40	99.73%	99.8%
23	Badger	16307133	12888.7	0.75	99.00%	4	101.00%	40	99.53%	100.5%
24	Badger	18807950	3803615.4	0.75	96.00%	4	101.00%	40	99.43%	100.0%
25	Badger	15771442	114858.4	0.75	99.00%	4	101.00%	40	99.83%	100.5%
26	Badger	32719535	75533.1	0.75	97.00%	4	101.00%	40	100.03%	100.3%
27	Badger	10580131	531189.8	0.75	97.00%	4	100.00%	40	99.53%	99.5%
28	Badger	32719515	1969225.7	0.75	96.00%	4	101.00%	40	99.93%	100.1%
29	Badger	29431342	1488239.4	0.75	95.90%	4	102.00%	40	100.00%	100.8%
30	Badger	29431347	2222797.5	0.75	98.90%	4	102.00%	40	99.70%	101.2%
31	Badger	29113380	1456845.2	0.75	96.90%	4	101.00%	40	99.10%	100.1%
32	Badger	10560145	454935.8	0.75	99.90%	4	101.00%	40	99.30%	100.6%
33	Badger	19240211	2388280.1	0.75	93.91%	4	101.00%	40	99.50%	99.7%
34	Badger	19263083	928956.8	0.75	95.90%	4	103.00%	40	99.30%	101.4%
35	Neptune	30536810	1763521.8	0.75	94.91%	4	102.00%	40	99.50%	100.6%
36	Badger	97195835	6399998.9	0.75	0.00%	4	0.00%	40	0.00%	0.0%
37	Badger	83488906	1481561.8	0.75	97.00%	4	100.90%	40	99.26%	100.1%
38	Badger	32763232	1489118.9	0.75	96.00%	4	101.90%	40	99.56%	100.7%
39	Badger	32362070	224334	0.75	96.00%	4	100.90%	40	99.96%	100.0%
40	Badger	32214135	5906684.6	0.75	94.00%	4	99.90%	40	99.66%	99.0%
41	Badger	15377055	31140.2	0.75	99.00%	4	100.90%	40	99.56%	100.4%

1.5" Positive Displacement Meter

1	Badger	35736072	9527989	1.5	100.10%	8	101.06%	50	101.30%	101.0%
2	Badger	14901640	340660	1.5	100.10%	8	101.56%	50	100.80%	101.2%
3	Badger	34054517	3886709	1.5	101.05%	8	102.36%	50	99.69%	101.8%
4	Badger	43060847	2251752	1.5	100.05%	8	101.35%	50	100.69%	101.1%
5	Badger	89431508	28840722	1.5	81.06%	8	95.28%	50	96.78%	93.4%
6	Badger	89431517	24219630	1.5	86.06%	8	98.29%	50	97.78%	96.4%
7	Badger	34051790	2346969	1.5	98.99%	8	101.29%	50	101.68%	101.0%
8	Badger	35756123	574170	1.5	100.99%	8	101.80%	50	101.19%	101.6%
9	Neptune	31807993	1206682	1.5	101.02%	8	99.31%	50	100.71%	99.8%
10	Badger	30062084	4192494	1.5	100.02%	8	100.31%	50	100.71%	100.3%
11	Neptune	31589559	6685250	1.5	93.01%	8	99.30%	50	96.72%	98.0%
12	Badger	14496695	241606	1.5	100.01%	8	100.70%	50	100.71%	100.6%
13	Badger	34057569	4846585	1.5	103.99%	8	101.31%	50	100.72%	101.6%
14	Badger	34060202	1869920	1.5	102.99%	8	101.31%	50	100.72%	101.5%
15	Neptune	20472464	12531652	1.5	93.37%	8	102.81%	50	100.96%	101.1%
16	Badger	97334777	26031066	1.5	99.40%	8	100.80%	50	98.96%	100.3%
17	Badger	17843819	27978311	1.5	0.00%	8	0.00%	50	0.00%	0.0%

2" Positive Displacement Meter

1	Badger	19089559	25367489	2	97.01%	15	99.60%	100	98.50%	99.0%
2	Badger	35726537	66564	2	0.00%	15	88.65%	100	89.54%	75.5%
3	Badger	29116278	1370651	2	98.01%	15	99.79%	100	99.73%	99.5%
4	Badger	14901709	1168790	2	99.01%	15	100.79%	100	100.73%	100.5%
5	Badger	14287681	469441	2	100.01%	15	100.79%	100	100.73%	100.7%
6	Badger	35747287	9372944	2	100.01%	15	99.79%	100	100.73%	100.0%
7	Badger	18896696	41182928	2	95.02%	15	99.92%	100	98.86%	99.0%
8	Badger	97223147	64190793	2	93.02%	15	99.92%	100	98.86%	98.7%
9	Badger	14814438	5513074	2	99.02%	15	100.92%	100	99.86%	100.5%
10	Badger	94194650	39083379	2	95.02%	15	99.92%	100	99.86%	99.2%
11	Badger	34060191	43158174	2	79.88%	15	98.93%	100	96.90%	95.8%
12	Badger	32344157	13632543	2	100.98%	15	100.93%	100	99.90%	100.8%
13	Badger	99676202	8695239	2	102.98%	15	101.93%	100	101.90%	102.1%
14	Badger	29116277	1703106	2	99.98%	15	100.93%	100	99.90%	100.6%
15	Neptune	31591933	9079815	2	20.00%	15	92.96%	100	98.95%	82.9%
16	Badger	13040577	6302577	2	98.00%	15	100.96%	100	99.95%	100.4%
17	Badger	35728679	9594048	2	99.00%	15	100.96%	100	100.95%	100.7%
18	Badger	19091435	9111701	2	98.00%	15	100.96%	100	99.95%	100.1%
19	Neptune	26117329	44764165	2	99.01%	15	99.99%	100	99.99%	99.8%

The Water Meter Accuracy Benefits have been calculated utilizing the accuracy analysis data provided by an independent 3rd party firm using AWWA (American Water Works Association) recommended testing procedures.

A first year baseline is mutually agreed upon and was established following the analysis of existing meters. That data is shown below in Table 4E - Summary of AWWA Standard Test Results. For the meters identified in Table 4E, the pre-retrofit water meter tests were performed on meters selected at random by ESG and approved by the City.

Table 4E - Summary of AWWA Standard Test Results

Meter Quantity by Size			
A	B	C	D
Meter Size	Quantity Tested	% Water of Annual Total that Flows via this size	First Year Accuracy %
5/8" and 3/4"	38	35.2%	88.80%
1"	41	16.0%	96.90%
1.5"	17	11.0%	94.10%
2"	19	34.7%	97.70%
Weighted Average Accuracy			93.93%

For each meter size, the measured accuracies indicated in Table 4D have been averaged and included under column D.

The Weighted Average Accuracy has been calculated as follows from Table 4E:

$$\text{Weighted Average Accuracy} = \text{Sumproduct (column C and column D)} / \text{Sum (column C)}$$

The first year baseline accuracy for 5/8" x 3/4", 1", 1.5", and 2" size meters can be seen in Table 4E above. At subsequent years of operation, the baseline meter accuracy is assumed to degrade at a rate of 0.25% annually. For the proposed system meter accuracy, the accuracy remains at 98.5% for the first five years and then degrades by 0.25% annually to take into account manufacturer accuracy warranty of five years on the 1.5" and 2" meters. The 5/8", 3/4" and 1" meters have accuracy guarantee from the manufacturer for 20 years. This is indicated in Table 4F - Baseline System Water Meter Accuracy Degradation and Table 4G - Post-Retrofit Guaranteed Weighted Average Meter Accuracy

Table 4F - Baseline System Water Meter Accuracy Degradation

Year	Baseline Accuracy
	All Sizes
1	93.9%
2	93.7%
3	93.4%
4	93.2%
5	92.9%
6	92.7%
7	92.4%
8	92.2%
9	91.9%
10	91.7%
11	91.4%
12	91.2%
13	90.9%
14	90.7%
15	90.4%

4.2 Performance Guarantee Approach

4.2.1 Water Meter Accuracy Benefits.

Increased Water Meter Accuracy Benefits do not include water being conserved or saved in a physical sense. The meter accuracy benefit is "Increased Billable Water Volume/Usage" as a result of the water meter replacement.

Post-retrofit water meter accuracy will be determined by an independent, third-party firm using American Water Works Association (AWWA) recommended analysis. The testing will be performed in accordance with AWWA

guidelines and will include a mutually agreed upon representative sample of water meters. This sample size will be a minimum 25 meters comprising of a combination of 5/8", 3/4", 1", 1.5", and 2" meters. Testing of larger meters (3", 4" and 6") is not included, and accuracy measurement from the sample of smaller meters tested will be applied on the larger meters.

- City will be responsible with supplying ESG with replacement meters for the meters that are pulled for sampling, and safe storage of meters tested and subsequently returned to the City and kept in safe storage annually to be used as the replacement meters for the next year's performance verification testing.

Only the actual accuracy of the water meter is guaranteed as outlined in Table 4G – Post-Retrofit Guaranteed Weighted Average Meter Accuracy below, as all other relevant factors are variables outside of the control of ESG. This testing will be performed once per year following the Final Acceptance Date of the project, unless terminated by the City as outlined in the Support Services Agreement (Exhibit C).

Table 4G – Post-Retrofit Guaranteed Weighted Average Meter Accuracy

Year	Guaranteed Accuracy
	All Sizes
1	98.5%
2	98.5%
3	98.5%
4	98.5%
5	98.5%
6	98.3%
7	98.0%
8	97.8%
9	97.5%
10	97.3%
11	97.0%
12	96.8%
13	96.5%
14	96.3%
15	96.0%

The following table indicates the accuracy testing sample size and the calculation methodology, for post retrofit water meter accuracy:

Table 4G – A Meter Testing

Meter Testing Quantity by Size			
A	B	C	D
Meter Size	Quantity Tested	% Water of Annual Total that Flows via this size	First Year Accuracy %
5/8" and 3/4"	9	35.2%	x
1"	9	16.0%	x
1.5"	3	11.0%	x
2"	4	34.7%	x
Weighted Average Accuracy			x

For each meter size, the measured accuracies will be averaged and included under column D.

The Weighted Average Accuracy has been calculated as follows:

Weighted Average Accuracy = Sumproduct (column C and column D)/Sum (column C)

This accuracy applies to the following baseline consumption and increased revenue as detailed in Table 4H below.

Table 4H - Year 1 Increased Volume and Revenue

Meter Size	Qty	Increased Billable Volume Water kGal	Increased Billable Volume Sewer kGal	Increased Water Revenue (\$)	Increased Sewer Revenue (\$)
All	8,878	53,610	44,639	\$398,577	\$236,326

The water and sewer billable volume increase and revenue increase are calculated as follows:

Increased Billable Volume (Water kGal) = Baseline Water Billed (kGal) x (Actual Post-Retrofit Measured Weighted Average Accuracy / Baseline Water Meter Accuracy)- Baseline Water Billed (kGal)

Increased Billable Volume (Sewer kGal) = Baseline Sewer Billed (kGal) x (Actual Post-Retrofit Measured Weighted Average Accuracy / Baseline Water Meter Accuracy)- Baseline Sewer Billed (kGal)

Increased Water Revenue = Increased Billable Volume (Water kGal) x Baseline Water Usage Rate (\$/kGal)

Increased Sewer Revenue = Increased Billable Volume (Sewer kGal) x Baseline Sewer Usage Rate (\$/kGal)

During the term of the contract, if the meter accuracy measurements (based on annual testing) fall below the guaranteed meter accuracy as indicated in table 4G, losses will be calculated for both water and sewer as follows, and this will be the amount of shortfall that ESG will owe the City :

*Losses (Water) = (Expected Increased Billable Volume
- Actual Increased Billable Volume) * Usage Rate (\$/kGal)*

*Losses (Sewer) = (Expected Increased Billable Volume
- Actual Increased Billable Volume) * Usage Rate (\$/kGal)*

Total Losses = Losses (Water) + Losses (Sewer)

Throughout the Term the Usage Rate will be the rate defined in Table 4B-A both water and sewer.

ESG's performance guarantee relating to water meters is limited solely to the accuracy of the meters as listed in Table 4G, operating under normal conditions, which have been replaced pursuant to this Contract. No guarantee, expressed or implied, is provided with respect to any other matters, including and without limitation to the following items (and the effects thereof that are outside ESG's reasonable control):

- Water system revenue
- Water usage/consumption trends
- Water rationing programs
- Demographic and/or population shifts
- Changes in the industrial or commercial base
- Regulatory changes
- Droughts, floods, rainfall, or other weather or climactic conditions
- Water system pressure variations
- Non-metered water usage
- Failure to collect amounts due for billable consumption
- Changes to water and sewer rate schedules
- Water quality
- Failure of the water system to meet governmental requirements
- Improper maintenance or unsound or neglectful usage of any equipment.
- Battery life of equipment or water meters
- Performance of new water meters and associated automatic meter reading equipment (warranty provided by manufacture).

4.2.2 Performance Guarantee • Project Benefits Shortfalls or Surpluses.

1. **Project Benefits Shortfalls.** If an Annual Project Benefits Shortfall occurs for any one Guarantee Year of the Performance Guarantee Term, ESG shall, at its discretion and in any combination, (1) offset the amount of such shortfall against any unpaid balance City then owes to ESG, (2) consistent with Section

3.2, above, offset the amount of such shortfall against documented Construction Period savings identified by ESG, (3) pay to City the amount of such shortfall or, with the consent of the City, or (4) increase the next year's amount of Annual Project Benefits Guarantee Amount by the amount of such current shortfall.

2. **Additional Project Improvement Measures**. When an Annual Benefits Shortfall has occurred, ESG may, subject to City's approval (which approval shall not be unreasonably withheld, conditioned, or delayed), implement additional Improvement Measures, at no cost to City, which may generate additional Project Benefits in future years of the Performance Guarantee Term.
3. **Rate Schedules** – City agrees to the rates used for the accuracy benefits, and to the rates escalated over the term of the guarantee. City further agrees that changes to the actual rates which are different from an equivalent rate schedule as indicated in this exhibit, will produce meter accuracy benefits that are different from those stated in this exhibit. Any reduction in monthly base charges, monthly allowable minimum base consumption, or monthly volume charges may reduce the anticipated project benefits to be recovered from improving meter accuracy. ESG understands that the City purchases water from sends sewer to neighboring Utilities (located in neighboring City/County), and there are factors outside of City's control that can affect the usage rates. Meter accuracy benefits calculations are based on rates indicated in Table 4B-A. Losses calculations are based on rates indicated in Table 4B-A, and not on actual future usage rates.

4.2.3 City Responsibilities with Respect to Water Meter Accuracy Benefits.

The City acknowledges and agrees to the following responsibilities in order for full Water Meter Accuracy Benefits and associated project benefits to be realized. ESG assumes no liability, and Water Meter Accuracy Benefits Guarantee is void, if the following items are not strictly adhered to.

1. **Systems Maintenance** - Ongoing care and maintenance of the utility system, including all meters, AMR equipment and systems, meter boxes, and meter vaults at or above manufacturers' specifications and recommendations beginning at route acceptance.
2. **Credits** - Any credits to water bills are the full responsibility of the City. Should the City choose to provide credits in the form of forgiveness or reduction of water bills as a service to its citizens, the City accepts responsibility for the decreased billable water volume. ESG will not be responsible for any type of monetary payment to the City based on credits.
3. **Rationing Programs** - The City acknowledges that the implementation of any water rationing programs will serve to decrease consumption and therefore decrease water revenue.
4. **Access** - The City is responsible for providing access to designated ESG employees for the purpose of verifying, adjusting and/or maintaining the facility improvement measures employed at the various Facilities.
5. **Damage** - The City assumes responsibility for any damage to the water meters by foreign objects as well as any intentional damage to the water meters by parties other than ESG personnel or their subcontractors.
6. **Non-metered Usage** - The City assumes responsibility for authorizing any non-metered water usage.

7. **Water Quality** - The City assumes responsibility for maintaining water quality. Any water quality issues that affect the water meter manufacturers' warranty are the responsibility of the City.
8. **System Pressure** - The City assumes responsibility for maintaining the average system pressure that was present during the baseline consumption period. A decrease in system pressure may cause subsequent decreases in both billed consumption and water revenue.
9. **Weather** - The City acknowledges that weather may effect water consumption. Changes in the number of degree-days and/or annual rainfall amounts may serve to either increase or decrease billed consumption and its associated water revenue.
10. **Demographics** - The City acknowledges that demographic shifts (population growth or shrinkage) and changes in commercial business, industrial business and wholesale accounts may affect water consumption and its associated water revenue.
11. **Vandalism** - The City assumes responsibility for any damage resulting from acts of vandalism.

5.0 OTHER PROJECT BENEFITS (NON-MEASURED)

Additional Non-Measured Meter Accuracy Savings identified in Section 3, Table 3A, have been identified and have been reviewed thoroughly with the City and are incorporated in the 15 year financial "modeling" of the overall project. These additional meter accuracy benefits have been identified, are agreed on by the parties and shall be considered fully satisfied upon Final Acceptance of the Project.

5.1 Large Commercial and Industrial Water Meter Savings

Large commercial and industrial water meters 3" or greater in size were not tested for accuracy during project engineering & development as there are too few meters to determine and establish an average aggregate accuracy of the large water meter population. Additionally, the meters would have to be tested in-ground which would have significantly increased the development costs incurred by the City. Subsequently, the City and ESG have agreed to assign a baseline accuracy for the larger meters of 93.93% accuracy to be used in calculating large water meter accuracy savings in year 1, and calculation methodology similar as stated in Section 4.1.3 and Table 4F, for the term of the project. This accuracy figure is equivalent to the average accuracy of the meters smaller than 3" that were tested. By applying accuracy increases to the agreed on consumption usage for the larger water meters, it is expected that the impact of increased billable water usage will result in significant meter accuracy benefits.

Table 5A - Large Water Meter Accuracy Benefits shows non-measured meter accuracy benefits for the larger commercial and industrial water meters that will be replaced as part of the performance based contract.

Table 5A - Large Water Meter Accuracy Benefits

Large Water Meter Accuracy Benefits (Non-Measured)		
Meter Size	"Agreed Upon" Baseline Accuracy %	Guaranteed Weighted Average Accuracy %
3", 4", 6"	93.93%	98.5%

It must be noted that the post-retrofit measured weighted average accuracy of the 2" and smaller meters will be utilized to calculate savings associated with the 3", 4", and 6" meters during the Guarantee Term. For purposes of clarity, the 3", 4" and 6" meters will not be measured specific, and, therefore, are considered Non-Measured Benefits for purposes of ESG's Performance Guarantee.

5.2 Operational & Avoided Future Cost Savings

Operational and Avoided Future Meter Cost Project Savings have been identified throughout project and scope development, have been reviewed thoroughly with the City, have been vetted and accepted by the City, and have been incorporated in the financial "modeling" of the overall project.

The total Operational Savings values are included in Table 3A -Sum of Project Benefits. A 3% inflation escalation rate is applied to each Performance Guarantee Year for all columns, and a 10% decrease year over year for years 11 thru year 15 for Material column, in Table 5B below. A breakout of these benefits is shown below in Table 5B - Operational & Avoided Future Cost Avoidance Savings.

The City and ESG stipulate and agree that all Operational Savings and Future Cost Avoidance Savings, shall be considered fully satisfied upon Final Acceptance of the Project.

Table 5B - Operational Avoided Future and Replacement Cost Savings

	Existing Meter Readers Cost Avoidance			Meter Repair & Replacement Cost Reduction	New Handheld Devices	Total Operational Savings
Contract Year	Labor Efficiency (Operations Efficiency)	Vehicle Maintenance (Operations Efficiency)	Truck Replacement (Operations Efficiency)	Material (Capital Cost Avoidance)	New / Replacement Cost (Operations Efficiency)	
Install	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1	\$ 98,056	\$ 16,377	\$ -	\$ 77,784	\$ -	\$ 192,217
2	\$ 100,998	\$ 16,868	\$ -	\$ 80,118	\$ 10,234	\$ 208,218
3	\$ 104,028	\$ 17,374	\$ 40,000	\$ 82,521	\$ -	\$ 243,923
4	\$ 107,148	\$ 17,896	\$ -	\$ 84,997	\$ -	\$ 210,041
5	\$ 110,363	\$ 18,432	\$ -	\$ 87,547	\$ -	\$ 216,342
6	\$ 113,674	\$ 18,985	\$ -	\$ 90,173	\$ -	\$ 222,832
7	\$ 117,084	\$ 19,555	\$ -	\$ 92,878	\$ -	\$ 229,517
8	\$ 120,597	\$ 20,142	\$ -	\$ 95,665	\$ 12,587	\$ 248,989
9	\$ 124,214	\$ 20,746	\$ 47,762	\$ 98,534	\$ -	\$ 291,257
10	\$ 127,941	\$ 21,368	\$ -	\$ 101,490	\$ -	\$ 250,800
11	\$ 131,779	\$ 22,009	\$ -	\$ 94,082	\$ -	\$ 247,870
12	\$ 135,732	\$ 22,670	\$ -	\$ 87,214	\$ -	\$ 245,616
13	\$ 139,804	\$ 23,350	\$ -	\$ 80,847	\$ -	\$ 244,001
14	\$ 143,999	\$ 24,050	\$ -	\$ 74,945	\$ -	\$ 242,994
15	\$ 148,318	\$ 24,772	\$ 57,030	\$ 69,474	\$ 15,480	\$ 315,075
TOTAL	\$ 1,823,735	\$ 304,594	\$ 144,793	\$ 1,298,268	\$ 38,301	\$3,609,691

Note: Basis for values in Table 5B: Please refer to the information in Appendix B2

End of Water Meter Accuracy Benefits Section

6.0 GLOBAL ASSUMPTIONS

6.1. Schedule of Verification Reporting Activities.

Item	Time for Submission	Owner's Review & Acceptance Period
Annual Report	Annual Report 90 days following the end of the First Guarantee Year	* 30 days

* Owner's Acceptance becomes automatic if not provided by the end of the Owner's Review & Acceptance Period.

7.0 DOCUMENTATION FOR SECTION 179D TAX DEDUCTION

As a result of ESG's design and implementation of this Project, a federal income tax deduction under Section 179D of the Internal Revenue Code ("IRC 179D") may become available to ESG as the party primarily responsible for designing energy efficiency improvements implemented at Customer's Facilities. Congress provided in IRC 179D(d)(4) for government owners, which do not pay income tax and are thus ineligible to use this deduction, to allocate the deduction to the party primarily responsible for designing the energy efficiency improvements, here ESG. Owner hereby agrees to allocate to ESG such deduction and any similar deduction enacted by Congress to replace IRC 179D. Owner agrees to cooperate with ESG by executing annually during the construction of the Measures, and promptly returning to ESG, a written allocation and declaration required by IRC 179D. ESG will prepare and is responsible for the accuracy of any allocation documents and all accompanying documentation supplied for Customer's signature. Notwithstanding anything to the contrary herein, Customer makes no representation concerning the availability or applicability of any such tax deduction benefits or of their ability to be allocated to or claimed by ESG. ESG assumes all risk related to such allocation and deduction.

8.0 ASSIGNMENT OF ENVIRONMENTAL ATTRIBUTES

As a result of the implementation of this Project, certain Environmental Attributes may be available, either now or in the future. This section specifies the process whereby the Owner will assign such Environmental Attributes to ESG.

"Environmental Attributes" means any and all credits, deductions, benefits, emission reductions, incentives, offsets, and allowances, howsoever entitled, attributable to and arising from the implementation of this Project, whether such Environmental Attributes now exist or are developed in the future. Environmental Attributes include but are not limited to: (1) Any avoided emissions of pollutants to the air, soil, or water; (2) Any avoided emissions of carbon dioxide (CO₂), methane (CH₄) and other greenhouse gases (GHGs); (3) Section 45 credits; (4) green tags; (5) renewable energy credits; and (6) The reporting rights to these avoided emissions such as White Tag Reporting Rights. Environmental Attributes also include any energy, capacity, reliability, or other energy reduction attributes that result from the implementation of this Project.

All Environmental Attributes arising from the implementation of this Project shall be owned by ESG. Owner agrees to execute all required documentation to assign all Environmental Attributes to ESG. If any filings are required with the Internal Revenue Service or some other governmental entity to obtain the benefits of the Environmental Attributes, Owner hereby instructs ESG to prepare and file such documents.

9.0 PROJECT INFORMATION:

ESCO Name: Energy Systems Group (ESG)
ESG Contact Person for M&V: Donna Wicks

Street Address: 4655 Rosebud Lane, Newburgh, IN 47630

Phone: (812) 492-3714 Fax: (812) 492-8461
E-mail: DWicks@EnergySystemsGroup.com

Customer Contact for M&V:

Customer Name: City of Oakland Park, FL
Customer Contact for M&V: Albert Carbon, Public Works Director

Address of Customer: 3801 NE 5th Ave., Oakland Park, FL -33334

Phone: (954-630-4458) Fax: () E-mail: albertc@oaklandparkfl.gov

10.0 DISPUTE RESOLUTION

The M&V plan has been reviewed and accepted by Owner. It is the primary document for the M&V process. If a dispute arises under this M&V agreement, the parties shall promptly attempt in good faith to resolve the dispute by negotiation. If not settled by negotiation, this M&V plan will be referred to as the means to solve related disputes.

11.0 POST-INSTALLATION DATA COLLECTED

Owner will provide access to site locations at reasonable times to perform on-site tests to verify performance, changes in use, and to verify modification of facilities as necessary. ESG will not unreasonably interfere with Owner's operation at the Facilities.

ESG will collect the appropriate utility billing data from Customer or appropriate Utility Providers for all ECMs being measured.

12.0 COST OF M&V ACTIVITIES

For Customer's project, the M&V plan is intended to continue throughout the term of financing. Customer, at its discretion may choose to discontinue the M&V plan. Proper notification procedures must be followed if such action is considered. Please refer to Exhibit C details regarding Owner's cancellation option.

Customer acknowledges and agrees that if, for any reason, it (i) cancels or terminates receipt of M&V Services, (ii) fails to pay for M&V Services, (iii) fails to fulfill any of its responsibilities necessary to enable ESG to complete the Work and provide the M&V Services, or (iv) otherwise cancels, terminates or materially breaches this Agreement, the Guarantee shall automatically terminate and ESG shall have no liability hereunder.

The amount to be paid annually by Customer for the M&V services provided by ESG is outlined in the Support Services Exhibit C of this contract. Please refer to Support Services exhibit for details on invoicing and payment procedures.

CITY OF OAKLAND PARK, FLORIDA

By 
Tim Loneragan

Its City Mayor

ENERGY SYSTEMS GROUP, LLC

By 
Gregory F. Collins

Its President

Appendix B1 – Automated Water Meter Operational Savings

Labor Efficiency and Vehicle Maintenance

Current Operations Costs		Description	Notes
Total Number of Meters	3	City employees	Provided by City
Cost Per Meter Read	\$0.00	City employees	
Total Cost of Meter Reads Per Month	\$0	Monthly cost	Provided by City
Total Cost of Meter Reads Per Year	\$142,800	Yearly Cost	Provided by City
Meter Reading Contract Escalation	3%	Annual Meter Reading Service cost increase	Assumed
Efficiency Generation via Project in Labor Costs	\$95,200.00	Meter reading wont be required	One reader to remain in current position for maintenance
Efficiency Generation in Meter Reader Vehicle (annual maintenance cost) Miles	\$15,900.00	Gas and Maintenance costs included in contract	\$0.53/mile (IRS Rate)

Truck Replacement

Trucks replaced every six years – Year 3 at \$40,000 for two trucks, and escalated at 3% every year for the remainder two replacements during the term

Meter, Lid, and Double Check Valves

Monthly Meter Replacements		Notes
Annual Meter Replacements	457	From City
Annual Meter Replacement Cost	\$ 75,000	From City
Estimated Reduction	95%	Assumed
Meter Replacement Cost Reduction	\$ 71,250	
Monthly Meter Repair (Lid Replacements)	10	From City
Annual Meter Repair (Lid Replacement)	120	
Cost per Meter Lid Replacement	\$ 17	Assumed
Annual Meter Repair Cost	\$ 2,040	
Estimated Reduction	99%	Assumed
Meter Repair Cost Reduction	\$ 2,020	
Monthly Meter Repair (Double Check Install)		
Annual Meter Repair (double check)	228	From City
Cost per double check Replacement	\$ 20	Estimate
Annual Repair Cost	\$ 4,560	
Estimated Reduction	99%	Assumed
Meter Repair Cost Reduction	\$ 4,514	

Handhelds

Total Number of Existing Handheld Devices	3	From City
Handheld Device Price (Each)	\$ 3,312	Assumed
Replacement Frequency	Every 6 Yrs	Assumed



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