



SOUTH FLORIDA WATER MANAGEMENT DISTRICT  
2011 – 2012 WATER SAVINGS INCENTIVE PROGRAM  
FUNDING PROGRAM

**EXHIBIT “D”**  
**Project Summary Report – FY2012**

Fixed AMR and DMA System for Leak Detection  
**Project Title**

Roger Greer  
**Recipient Project Manager**

4600002552 / 9500005189  
**SFWMD Contract Number / Purchase Order Number**

Port LaBelle Utility System  
**Recipient Name (Project Owner)**

Type of Water Savings Incentive Project	Project Start Date	Project End Date	Proposed Water Savings
<i>Installation of core elements for Fixed AMR Network</i>	11/10/01	12/08/31	2 MG/Y

**Was the original project scope fulfilled per the District contract? Yes No If no, provide an explanation below.**

COST FOR THIS PROJECT		
	Contract Amounts	Actual Costs
Total Project Cost	\$69,925.00	\$ 69,925.00
FUNDING BREAKDOWN FOR THIS PROJECT		
District Funding	\$38,250.00	\$ 38,250.00
Local Funds	\$31,675.00	\$ 39,976.65
Other Funding Source / In-kind Services From: Intelligentsia International (interns)	\$0.00	\$ 0.00
<b>TOTAL PROJECT COST</b>	<b>\$69,925.00</b>	<b>\$ 78,226.65</b>

**To the best of my knowledge, the above information is correct**

**Entity Project Manager**

*- All supporting documentation is to be included to support Actual Costs and Actual Water Savings for this project as specified in the deliverables table. Supporting documentation is to include but not limited to, copy of Entity invoice, Entity signed completion letter, copies of vendor invoices, documented man-hours (if applicable), and any other in-kind services (if applicable).*

Please provide a brief project summary below.

- Please feel free to continue your answer on additional sheets if necessary.

### Project Overview:

Provide a brief project summary below. Feel free to continue your responses on additional sheets if needed. Describe original scope of work versus what was actually completed. If applicable, explain why the original scope was not completed. If your project scope was completed under budget, please briefly explain why. How was this Project executed/implemented?

The original scope of work submitted in the project proposal called for (A) purchase and installation of the Phase 1 components of a Masterlinx Fixed-base AMR system (i) repeater, (ii) concentrator, (iii) software, (iv) database and (v) boosters; (B) establishment of a daily leak detection and notification system for homeowners; (C) assembly of the initial elements of a leak detection protocol based on an AMR, leak sensors & DMA approach; and (D) planning for continuation of the WaterSIP PLUS distribution pipes leak detection infrastructure program. All goals were accomplished, although only (A) is required by the WaterSIP project agreement scope of work.

Device Purchased and Installed / Rebates Processed	Number of Devices Proposed in Application	Number of Devices Actually Installed / Processed	Cost per Device Purchased	Number of Dwelling Units (residences) or Facilities Affected	Cost per Affected Unit	Total Cost
Repeater System	1	1	\$27,800.00	500	\$55.60	\$27,800.00
Booster	10	10	\$82.50	20	\$41.25	\$825.00
Concentrator	1	1	\$11,100.00	1516	\$7.32	\$11,100.00
Software & Training	1	1	\$5,475.00	1516	\$3.61	\$5,475.00
Database Annual Fee	1	1	\$4,725.00	287	\$16.46	\$4,725.00

As part of its leak detection protocol development component of the project, PLUS invited four companies specialized in the manufacture and sale of acoustic leak detection equipment. The equipment demonstrations were carried out from the end of January to the end of February. Even though it was concluded that acoustic detection is less suitable for the PLUS HDPE pipe network, two significant leaks were pinpointed and repaired. The demonstration also showed indications of additional leaks somewhere along the same stretch of pipe. As a result, PLUS staff excavated this entire 1300-ft stretch of pipeline and discovered many more leaks. The repairing of the two leaks and the repair of additional leak along the same section of pipeline has saved PLUS at least 6 MG in 2012.

The first repeater system was installed by Master Meter from May 7<sup>th</sup> through 11<sup>th</sup>, 2012. The installation process was delayed due to complications in delivery of electricity to the PLUS antenna tower. Approximately two weeks after completion it became clear that only 287 meters could be monitored with daily frequency through the Masterlinx webpage. This means that PLUS will need a large number of boosters to complete coverage of the repeater system and additional repeater towers. PLUS installed 10 boosters in Port LaBelle on June 16<sup>th</sup> to assess which areas that can get full coverage from the first repeater system. The boosters were activated with help of Municipal water works on June 27<sup>th</sup>. However, the booster transmissions could not be monitored through the webpage until July 27<sup>th</sup>. From August 8<sup>th</sup> through 10<sup>th</sup>, Master Meter installed the concentrator, activated the software, and conducted onsite training for the Masterlinx software and the new drive-by meter reading software and procedures associated with Masterlinx.

The Masterlinx training formalized the procedures for and use of the web-based software for homeowner leak detection and daily notification, satisfying goal B. The web-based system includes the establishment of homeowner user accounts, which will be implemented once sufficient water use history can be accumulated in the online database.

All tasks associated with the project scope of work (goals A & B) were completed by Aug 10, 2012. See the appendix (AMR Report) for further details of the PLUS Fixed-base AMR system development, including progress on goals C and D of the PLUS leak detection program.

**Estimated or Actual Water Savings:**

Show how estimated water savings for this Project was calculated if actual water savings are not available.

PLUS estimate that at least 6 MG was saved due to this WaterSIP project through direct and indirect activities of the WaterSIP project. Direct savings include the leaks detected along S. Rosebud Ave, the repairs of which are credited with reducing daily WTP flows by 0.05 mgd from February to March. Assuming the project activities advanced the detection of these leaks by 2 months yields an estimate of 3 MG savings. Later excavation of the entire stretch of pipe and discovery/repair of its other leaks resulted in an additional reduction of 0.05 mgd, saving a similar volume of water, 3 MG for a total of 6 MG.

To estimate the distribution system leakage rate PLUS WTP output was converted to average home consumption rates for each year since 2000. The annual household consumption rates were average over the years 2000 to 2008 to establish the baseline demand of 221 gpd per residential connection. Annual losses were estimated as the difference between average household consumption for that year and the baseline, multiplied by the number of residential units in that year. Leakage rates increased from 2009 to 2011, peaking at 27% of total WTP production or 46 MG in losses.

Yr	Home Usage GPD	Project Yr	Goal Reduction(a) in Loss Rate	Goal Loss Rate(b)	Goal Savings MG(c)	Actual Loss Rate(d)	Actual Losses MG(d)	Actual Saved MG(c)
2008	221							
2009	232	-2				5%	6	
2010	258	-1				14%	21	
2011	303	0	0%	25%	0	27%	46	
2012	242	1	10%	23%	2	9%	12	34
2013		2	20%	20%	2			
2014		3	40%	15%	6			
2015		4	60%	10%	6			
2016		5	80%	5%	10			

(a) = Project goal is to reduce the 2011 loss rate by 80% over 5 years

(b) = Loss rate goal, baseline is 2000-2008 average household usage, 221 GPD

(c) = Water savings, compared to prior year usage

(d) = Overall measured losses, relative to the 2000-2008 baseline

The 2011-12 WaterSIP project savings goal was 2 MG, but 34 MG will have been saved in 2012 if flow patterns remain steady through to December. Of this 34 MG savings, at least 6 MG is directly attributable to the WaterSIP project, possibly substantially more since it is impossible to know how long PLUS staff would have required to discover and repair the leaks without the WaterSIP project.

The nature of the PLUS distribution system leak problem is such that leakage has increased 6 to 25 MG in a single year. Thus, by December 2012 the actual volume saved could be significantly less than 34 MG. Regardless, the total volume of water saved will remain far above than the original 2 MG goal for the first project year.

The full waters savings impact of this first phase of the five-year leak detection infrastructure project will only be fully realized when the entire project is completed and PLUS has full coverage of its connections through the fixed-base ARM system and it has developed the valves and meters network to create a District Metered Area (DMA) system. At that point PLUS will be able to isolate subsections of its service area and perform near real-time mass balances on these areas. Given this capability, the savings realized in this first phase (34MG savings and 9% overall loss rate) can be defended and maintained as new leaks develop in the system.

**To the best of my knowledge, the above information is correct**

***Entity Project Manager***

***All supporting documentation is to be included to support Actual Costs and Actual Water Savings for this Project as specified in the deliverables table.***