Autoridad de Acueductos y Alcantarillados
GOBIERNO DE PUERTO RICO

Puerto Rico Aqueduct and Sewer Authority

FINAL REPORT

Consulting Engineer's Supplemental Report
to the FY2010 Consulting Engineer's Report
in connection with the Puerto Rico Aqueduct and Sewer Authority's 2012 Bond Issue

January 2012

MP ENGINEERS of PUERTO RICO and its subcontractor
MALCOLM PIRNIE | ARCADIS
The Water Division of ARCADIS

Puerto Rico Aqueduct and Sewer Authority

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Report Prepared By:

MP Engineers of Puerto Rico, PSC and its subcontractor Malcolm Pirnie

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Acronyms

Capitalized and abbreviated terms contained in this report are defined below. The terms listed below appear in multiple sections of this report, and are thus defined here for reference.

Acronym	Definition
ABT	Additional Bonds Test
AOP	Advanced Oxidation Processes
APU	Alternate Power Unit
AWWA	American Water Works Association
CAA	Coefficient of Annual Adjustment
CAB	Annual Base Coefficient
CBA	Collective Bargaining Agreement
CD	Coefficient of Deficiency
CER	Consulting Engineer's Report
CIP	Capital Improvement Program
CWA	Clean Water Act
DBP	Disinfection Byproduct
DBPR	Disinfection Byproduct Rule
DMR	Discharge Monitoring Report
DSC	Debt Service Coverage
EDC	Endocrine Disrupting Compounds
EPC	Energy Performance Contract
EQB	Puerto Rico Environmental Quality Board
FOA	Fiscal Oversight and Support Agreement
FY	Fiscal Year
GDB	Government Development Bank for Puerto Rico
GIS	Geographic Information System
gpm	Gallons per minute
GWR	Groundwater Rule

Acronym	Definition
HAA	Haloacetic Acid
HIEPAAA	Hermandad Independiente de Empleados Profesionales de la Autoridad de Acueductos y Alcantarillados
IPMP	Integrated Preventive Maintenance Program
kWh	Kilowatt-Hour
LOC	Line of Credit
LRAA	Locational Running Annual Average
LT2 ESWTR	Long Term 2 – Enhanced Surface Water Treatment Rule
M	Million
MAT	Master Agreement of Trust
MCL	Maximum Contaminant Level
M-DBP	Microbial and Disinfection Byproducts Rules
MW	Megawatts
MG	Millions of Gallons
MGD	Million Gallons per Day
MPPR	MP Engineers of Puerto Rico, PSC
NDMA	N-nitrosodimethylamine
NF	Nano Filtration
NPDES	National Pollutant Discharge Elimination System
NRW	Non-Revenue Water
NRWRP	Non-Revenue Water Reduction Program
NTU	Nephelometric Turbidity Units
O&M	Operations and Maintenance
PAN	Programa de Asistencia Nutricional
PAP	Proyectos Apremiantes (“Urgent Projects”)
PM	Preventive Maintenance
PMC	Program Management Consultant
PPA	Power Purchase Agreement
ppb	Parts Per Billion
PPCP	Pharmaceuticals and Personal Care Products
PRASA	Puerto Rico Aqueduct and Sewer Authority
PRDOH	Puerto Rico Department of Health
PREPA	Puerto Rico Electric Power Authority
RFP	Request for Proposals
RFQ	Request for Qualifications
R&R	Renewal and Replacement
SAP	Systems, Applications, and Products in Data Processing

Acronym	Definition
SAP-ISU	Systems, Applications, and Products in Data Processing Industry Specific Solution for Utilities
SDWA	Safe Drinking Water Act
STS	Sludge Treatment System
SRF	State Revolving Fund
SWTR	Surface Water Treatment Rule
TANF	Programa de Asistencia Temporal para Familias Necesitadas
TOC	Total Organic Carbon
TTHM	Total Trihalomethane
UIA-AAA	Unión Independiente Auténtica de la Autoridad de Acueductos y Alcantarillados
U.S.	United States
USEPA	United State Environmental Protection Agency
WPS	Water Pump Station
WTP	Water Treatment Plant
WWPS	Wastewater Pump Station
WWTP	Wastewater Treatment Plant
YTD	Year-to-Date

Executive Summary

E.1. Introduction

MP Engineers of Puerto Rico, PSC and its subcontractor Malcolm Pirnie, Inc (MPPR/Malcolm Pirnie) have been retained by the Puerto Rico Aqueduct and Sewer Authority (PRASA) as its Consulting Engineer to assist in the preparation of a Supplemental Report to the fiscal year (FY) 2010 Consulting Engineer's Report CER) to enable it to issue revenue bonds and incur other indebtedness to mainly repay and refinance existing debt and to partially finance its five-year Capital Improvement Program (CIP) that runs from FY2012 through FY2016.

This Supplemental Report documents material changes in PRASA that may have taken place since the completion of the FY2010 CER which covered the period from July 1, 2009 through June 30, 2010. Where possible, an independent opinion is provided regarding the following:

- Condition of PRASA's water and wastewater (sewer) systems (collectively, the System)
- Operations and management (O&M) practices and operational initiatives
- Planned CIP and compliance with regulatory requirements
- Financial forecast for fiscal years 2012 through 2016

E.2. Condition of System

PRASA owns a large variety of assets, including land, buildings, dams, wells, water and wastewater treatment facilities and pump stations, ocean outfalls, buried infrastructure, vehicles, equipment, and water meters. In FY2010, MPPR/Malcolm Pirnie has assessed the condition of PRASA's System by inspecting a sample of the major elements of the System. The purpose of these inspections was to identify the overall condition of the facilities and to determine if they are being operated and maintained in a manner consistent with their operating goals. The assessment also provided an opportunity to verify PRASA's CIP alignment with System needs.

The evaluation criteria used in the facility inspections were: compliance, operations / process control, equipment / maintenance, and staffing / training. An overall facility rating was then determined based on the calculation of a weighted average of the ratings for each criterion. The condition of the facilities visited varied from new to those requiring significant capital upgrades. Compliance with discharge permit limits and drinking water standards varied depending on the plant age, condition and experience of operators. Facility conditions averaged an adequate rating overall.

Despite some operational compliance issues, the treatment facilities are generally producing and delivering potable water and conveying and treating wastewater adequately. PRASA has shown that with the implementation of several initiatives that include O&M improvements and the

establishment of a planned CIP, among others, the overall conditions rating for these facilities continues to improve as shown in Table ES-1.

Table ES-1:
Asset Condition Ratings by Category

Asset Category	Overall Condition Ratings			Change 2008 vs. 2010		Change 2009 vs. 2010	
	2008 CER	2009 CER	2010 CER	Overall Score	Percent	Overall Score	Percent
Regulated Dams	Adequate	Adequate	Adequate	0.0	0%	0.2	10%
Water Treatment Plants	Adequate	Adequate	Adequate	0.1	5%	-0.1	-4%
Wastewater Treatment Plants	Adequate	Adequate	Adequate	0.1	5%	0.0	0%
Wells	Adequate	Adequate	Adequate	0.1	5%	0.2	11%
Water Pump Stations	Adequate	Adequate	Adequate	0.1	5%	0.1	5%
Water Storage Tanks	Adequate	Adequate	Adequate	-0.3	-16%	0.0	0%
Wastewater Pump Stations	Adequate	Adequate	Adequate	0.3	18%	0.0	0%

Although buried infrastructure was not inspected, in FY2010 MPPR/Malcolm Pirnie analyzed the data collected by PRASA on water leaks and sewer overflows. Reported active leaks and sewer overflows remain at very high levels when compared to other utilities in the United States (U.S.) and Canada. Also, PRASA's unaccounted-for water, or non-revenue water (NRW), percentage continued at 64% in FY2010. Based on a comparison to other utilities in the U.S. and Canada, PRASA's NRW is extremely high. In a recent utility survey, the median unaccounted for water for all survey participants ranged from 8.5% to 9.9% (*Benchmarking Performance Indicators for Water and Wastewater Utilities: 2007 Annual Survey Data and Analyses Report*, AWWA 2008).

Notwithstanding the above, PRASA has embarked on the development of a strategic NRW management and reduction plan. For this, in late 2011, PRASA retained the services of Miya Puerto Rico LLC (Miya) a local subsidiary of Miya Luxemburg Holdings S.a.r.l., a world-renowned NRW consultant. The objective of this strategic NRW management and reduction plan is to provide PRASA with the necessary information to embark on a comprehensive and cost-effective long-term NRW management program.

Since the completion and issuance of the FY2010 CER, PRASA reports no material changes in the condition of the System. Additionally it reports that significant improvements have been made regarding the leaks and overflow repair metrics; although the occurrence of these continues to be high when compared to U.S. benchmarks.

E.3. O&M Practices and Operational Initiatives

PRASA's O&M practices are adequate. One recurring finding in the facility inspections is the need for facility-specific O&M plans or manuals for treatment plants. Also, there is an identified need of standardized processes for prioritizing and scheduling preventive, corrective and routine maintenance activities. However, with the objective of developing a model operating standard for

its plant facilities, PRASA began the development of the "Ideal Plant" initiative in FY2012. Based on the results of comprehensive audits at each facility, through this initiative PRASA looks to identify and cost-effectively address facility-specific shortcomings in areas including, but not limited to: infrastructure, compliance, staff and training, operations and process controls, risk management and safety, and documentation (i.e., O&M plans).

The American Water Works Association (AWWA) has collected benchmarking data from water and wastewater utilities throughout the U.S. and Canada. Table ES-2 provides a comparison of PRASA's metrics to several key O&M benchmark performance indicators. Although in FY2010 PRASA experienced a slight reduction in its water and wastewater O&M cost metrics when compared to FY2009 results, PRASA's costs metrics increased again in FY2011. The increase was mainly caused by higher electricity, maintenance and repair costs, and other expenses such as professional services, materials and supplies.

Table ES-2:
PRASA Metrics vs. Water/Wastewater Utilities Benchmarks[1]

Benchmark Category	Utility Category	Top Quartile	Median	Bottom Quartile	PRASA
Water O&M Cost per Account[2]	Serve > 500,000	$163	$233	$319	FY2009: $294 FY2010: $292 FY2011: $309
	Combined W & WW	$134	$247	$411	
	All Utilities	$148	$258	$374	
Water O&M Cost per MG Processed	Serve > 500,000	$885	$1,320	$1,665	FY2009: $1,585 FY2010: $1,555 FY2011: $1,702
	Combined W & WW	$863	$1,431	$2,089	
	All Utilities	$942	$1,459	$2,114	
Wastewater O&M Cost per Account[2]	Serve > 500,000	$120	$209	$303	FY2009: $216 FY2010: $214 FY2011: $225
	Combined W & WW	$114	$209	$291	
	All Utilities	$127	$213	$306	
Wastewater O&M Cost per MG Processed	Serve > 500,000	$906	$1,500	$1,859	FY2009: $1,984 FY2010: $1,949 FY2011: $2,067
	Combined W & WW	$1,200	$2,022	$3,044	
	All Utilities	$1,148	$2,022	$2,986	

[1]Source: Benchmarking Performance Indicators for Water and Wastewater Utilities: 2007 Annual Survey Data and Analyses Report, AWWA (2008)
[2]Includes total operation and maintenance costs, less depreciation and costs related to customer (commercial) services. PRASA reported values include payroll and related, power, chemicals, Superaqueduct service contract, insurance and other expenses, less capitalized operating expenses.

PRASA is currently implementing five key operational initiatives that target O&M optimization, cost reductions and revenue enhancements. These are:

- Non-Revenue Water (NRW) Reduction Program
- Comprehensive Energy Management Program
- Integrated Preventive Maintenance Program

- Treatment Plant Automation Program
- Customer Geodatabase and AMR/AMI Systems for Large Meter Customers

These operational initiatives represent significant operational and financial improvement opportunities for PRASA.

E.4. Capital Improvement Program and Regulatory Compliance

PRASA's CIP has a comprehensive listing of projects and budgets for the five fiscal years ending on June 30, 2016. In FY2011, PRASA's capital expenditures were approximately $338.5 million (M). PRASA's FY2012-2016 CIP includes $1,558.7M, of which approximately $634.7M correspond to capital expenditures for mandatory (compliance-driven) projects.

There are 647 projects currently included in the CIP for the period FY2012 – FY2016. Projects included in the CIP cover major capital improvements identified throughout PRASA's five Operational Regions (North, South, East, West and Metro), as well as island-wide initiatives such as technological advancements, telemetry, preventive maintenance, meter replacement, and renewal and replacements (R&R) to the System.

PRASA's CIP addresses the requirements of the 2006 United States Environmental Protection Agency (USEPA) Wastewater Consent Decree (2006 Consent Decree, or the "Mega" Consent Decree), the 2006 Puerto Rico Department of Health (PRDOH) Drinking Water Settlement Agreement (PRDOH Agreement), and the 2010 USEPA Sludge Treatment Systems (STS) Consent Decree. Review of PRASA's CIP showed that all of the WTP and WWTP facilities that were considered unacceptable in terms of compliance currently have CIP projects identified to either rehabilitate or close the facility, thus addressing existing compliance problems.

The planned CIP along with the O&M initiatives are generally in alignment with the System needs. However, there may be additional R&R and CIP needs to address: 1) buried infrastructure improvements including, but not limited to, additional wastewater collection system repair improvements that PRASA may be required to implement to bring these into compliance, and 2) future regulations that may impact PRASA's System. Based on the condition assessment and CIP review completed by MPPR/Malcolm Pirnie, PRASA has an adequate CIP implementation program that, if well managed, it is expected to meet PRASA's needs. The existing CIP includes a contingency to address future regulations and any other regulatory requirements that PRASA may need to comply with. However, the impact of these may require significant operational and capital investments, which may not be covered by these contingencies. As the impact of future regulations becomes more defined, CIP modifications will be required to adequately accommodate resulting needs.

E.5. Financial Analysis

In the preparation of this Supplemental Report, MPPR/Malcolm Pirnie reviewed the PRASA-prepared FY2012 through FY2016 financial forecast (the Forecast) shown in Exhibit 1 (enclosed at the end of this section). MPPR/Malcolm Pirnie opined on the reasonableness of this forecast and provided recommendations to PRASA. The purpose of MPPR/Malcolm Pirnie's review was to assess the adequacy of the revenues and expense categories that make up PRASA's Forecast. Additionally, the Forecast illustrates the anticipated debt service coverage (DSC) for the five fiscal years from July 1, 2011 through June 30, 2016 (the forecast period).

The Forecast presents PRASA's estimate of the expected results of operations and DSC for the forecast period. Thus, the Forecast reflects PRASA's judgment, based upon present circumstances, as to the most likely set of conditions and course of action. However, there will usually be differences between forecasted and actual results, because events and circumstances frequently do not occur as expected, and those differences may be material.

Although PRASA experienced a reduction in service revenues of approximately $27M from FY2010 to FY2011 (mostly due to one-time prior years' service charge adjustments that were recorded in FY2011, which had no impact on cash collections for the year), its collection rate significantly improved over previous years' results. Also, based on the results for FY2009 ($11.8M), FY2010 ($67.3M) and FY2011 ($74.6M), PRASA continued to successfully implement its operational initiatives which to date have generated approximately $155M in additional revenue for PRASA. In terms of expenses, PRASA has continued to reduce some of its operational costs, achieving reductions in several expense categories, with significant recorded reductions in the payroll and benefits expense category. However, while PRASA's energy consumption remains stable, electricity costs continue to increase.

In connection with the 2012 bond issue, on January 24, 2012 PRASA's Board of Directors authorized the execution of an amended and restated Master Agreement of Trust (2012 MAT) by and between PRASA and Banco Popular de Puerto Rico as Trustee, and an amended and restated Fiscal Oversight Agreement (2012 FOA) by and between PRASA, the Commonwealth of Puerto Rico and the Government Development Bank for Puerto Rico (GDB). PRASA's Forecast has been structured considering the requirements of both the 2012 MAT and the 2012 FOA including:

1. Change from a net revenue pledge to a gross revenue pledge for Senior, Senior Subordinated, and Subordinated lien levels.
2. Updated Rate Covenant requirements.
3. Creation of a Budgetary Reserve Fund to be held by the GDB in trust for PRASA that will hold the Budgetary Reserve Requirement to the extent funded by Commonwealth appropriations or other sources of funding.
4. Additional fiscal oversight requirements to be met by PRASA.

The Operating Revenues (presented on a cash basis) include service revenues (net of uncollectibles and subsidies), revenues from operational initiatives, as well as other sources of revenues such as interest income, developer fee contributions, and funds from the Rate Stabilization account. Operating Revenues exclude funds from the Budgetary Reserve Fund or special assignments from the Central Government. Upon review of the Operating Revenues, MPPR/Malcolm Pirnie found these to be reasonable.

Additionally, PRASA has included in its Forecast additional sources of revenue from the Budgetary Reserve Fund and Other Measures yet to be identified (also presented on a cash basis). These, combined with the Operating Revenues, make up the Authority Revenues. PRASA is projecting draws from the Budgetary Reserve Fund in amounts of $95M and $145M in fiscal years 2012 and 2013, respectively. These amounts shall be funded with bonds proceeds. The Forecast shows that PRASA projects funding deficits in the amount of $330M, $385M, and $420M for FY2014, FY2015, and FY2016, respectively. PRASA is projecting that these deficits will be covered with additional transfers from the Budgetary Reserve Fund, from the implementation of changes in the rate structure (which may include rate increases), from other measures to increase revenues and/or reduce costs, or from a combination of these measures. MPPR/Malcolm Pirnie agrees that these projected deficits are accurate.

While PRASA's financial forecast does not specify how the Budgetary Reserve Fund will be funded once its initial funding has been depleted, the 2012 FOA clearly states that PRASA shall be obligated to implement revenue enhancing and/or cost reducing measures, revise its rates and fees, or implement a combination of these actions, in the case the Commonwealth fails to seek or receive an appropriation to satisfy the Budgetary Reserve Requirement. Also, even though PRASA has not raised rates in recent years due to the local economic situation in Puerto Rico, the Commonwealth has provided the necessary funding to cover deficits in FY2010, FY2011 and FY2012. As such, it is MPPR/Malcolm Pirnie's opinion that it is reasonable to assume that support from the Commonwealth will continue if it is needed at some time during the forecast period.

PRASA's Current Expenses projections (presented on an accrual basis) are also reasonable. Payroll and Benefits expenses take into consideration PRASA's recently negotiated and approved collective bargaining agreement conditions with its largest union (the UIA-AAA, by its Spanish acronym) and provides for additional salary increase in the future. Other expense projections such as electricity, chemicals, and maintenance and repair, include provisions to account for inflation over the forecast period. Conservatively, PRASA's Forecast does not include the potential additional cost savings resulting from PRASA's Comprehensive Energy Management Program. Year-to-date (YTD) results shall be closely monitored and projections shall be adjusted based on those results.

Finally, as shown Tables ES-3 and ES-4, the financial forecast also adequately addresses the DSC and Additional Bonds Test (ABT) requirements as defined in the 2012 MAT. Debt service

requirements in PRASA's Forecast include current debt and projected future bond issuances that are expected to be necessary to finance the CIP. PRASA projects that it will meet the DSC targets as required by the MAT. If the DSC requirement is not met, the MAT outlines specific actions, remedies, and timetables for PRASA to comply with the MAT. The projected DSC results for the forecast period have been calculated using the Rate Covenant requirements as included in the 2012 MAT and the new definitions of Operating Revenues and Authority Revenues. Based on the anticipated annual debt service obligations over the forecast period and the projected Operating Revenues and Authority Revenues, PRASA would meet its DSC requirements. This is contingent upon PRASA being able to secure the necessary additional cash inflows resulting from changes in its rate structure, from the implementation of rate increases, and/or other measures; continuing with the successful implementation of its operational initiatives; maintaining its billings and collections performance; and controlling its operational expenses as projected.

Table ES-3:
FY2012 – FY2016 Projected Debt Service Coverage

Debt Service Level	DSC Requirement	FY2012	FY2013	FY2014	FY2015	FY2016
Senior Debt	2.50	8.15	7.79	2.81	2.56	2.55
Senior Subordinate Debt	2.00	7.59	7.79	2.81	2.56	2.46
Subordinate Debt	1.50	7.59	7.79	2.81	2.56	2.46
Authority Revenues / All Operating Expenses and Debt Service	1.00	1.00	1.00	1.01	1.01	1.01

For ABT purposes, Operating Revenues are divided by the maximum annual debt service for any fiscal year. Table ES-3 summarizes PRASA's projected ABT compliance over the forecast period (as shown in Exhibit 1). The projected ABT results for the forecast period have been calculated using the modified requirements as included in the 2012 MAT.

Table ES-4:
FY2012 – FY2016 Projected ABT Calculation

Debt Service Level	Requirement[1]	FY2012	FY2013	FY2014	FY2015	FY2016
Senior Debt	2.5/1.5	3.20	2.77	2.60	2.54	2.55
Senior Subordinate Debt	2.0/1.5	3.20	2.77	2.60	2.45	2.36
Subordinate Debt	1.5	3.20	2.77	2.60	2.45	2.36

[1] Two tests apply to future debt. The first test is Operating Revenues divided by existing and proposed debt service (at the existing lien level); the second test is Operating Revenues divided by existing and proposed debt service (regardless of lien level) plus specified Reserve Fund deposits.

E.6. Conclusions

In preparation of this report and the conclusions contained herein, MPPR/Malcolm Pirnie has relied on certain assumptions and information provided by PRASA with respect to the conditions which may exist or events which may occur in the future. MPPR/Malcolm Pirnie believes the information and assumptions are reasonable, but has not independently verified information provided by PRASA and others. To the extent that actual future conditions differ from those assumed herein or provided to us by others, the actual results will vary from those forecast.

Set forth below are the principal opinions which MPPR/Malcolm Pirnie has reached regarding the review of PRASA's System, CIP and financial projections; for a complete understanding of the assumptions upon which these opinions are based, this report should be read in its entirety:

1. The condition of the facilities visited varied from new to those requiring capital upgrades. The condition of most facilities with implemented CIP projects improved from FY2009 to FY2010. However, a number of treatment facilities are operating out of compliance with discharge permit limits and drinking water standards. Despite these compliance problems, the facilities are generally producing and delivering potable water and conveying and treating wastewater to a level of competency. PRASA reports that no material changes regarding the System condition have occurred since FY2010.

2. PRASA's O&M practices are adequate. However, there is a need for standardization of O&M practices across regions and the need for facility-specific O&M plans or manuals for facilities. Also, there is an identified need of standardized processes for prioritizing and scheduling preventative, corrective and routine maintenance activities.

3. PRASA's operational initiatives are well developed and address critical aspects of PRASA's operation such as energy costs and non-revenue water. The Revenue Optimization Program and Staff Reduction Program have provided significant benefits to PRASA in the form of increased revenues and cost reductions, respectively. Once implemented as planned, PRASA's operational initiatives could provide substantial additional economic and operational benefits to PRASA in the future.

4. PRASA must continue to maintain its commitment for the implementation of the IPMP. In addition, PRASA must continue a focused corrective maintenance and R&R program in order to improve leaks and overflow metrics, to maintain and improve the condition of the System, and to provide a program for the long-term preservation of the System assets. PRASA has included provisions for the continuous implementation of the IPMP in its CIP and O&M financial projections.

5. With the possible exception of buried infrastructure improvements, the planned CIP along with the O&M initiatives are generally in alignment with the System needs. Some additional needs at select plant facilities have been identified by PRASA in recent months.

6. On average, PRASA has included in its CIP approximately $44.6M in each year of the Forecast for R&R. Given PRASA's high rate of leaks and overflows, and continuing aging infrastructure, PRASA should consider increasing its annual R&R program funding and accelerating its R&R program. For this, an analysis of PRASA's R&R needs and budget is recommended in order to develop a sound R&R program that will allow PRASA to improve and extend the useful life of its System.

7. The CIP adequately addresses all mandated requirements of existing consent decrees and agreements with Regulatory Agencies. The full impact of future regulations and other regulatory requirements on PRASA's System are not known at this time. In some cases, future regulations and additional regulatory requirements are expected to require minor process changes and in other cases major capital improvements, such as construction of new treatment processes and intensive repair programs. In general, the existing CIP does not include projects intended solely to address future regulations or additional regulatory requirements that may be imposed on PRASA. Although, the existing CIP includes a contingency to address future regulations and any other regulatory requirements that PRASA may need to comply with, the impact of these may require significant operational and capital investments. PRASA continues to make allowances in its new designs to improve capabilities to meet certain future regulations. As the impact of future regulations becomes more defined, CIP modifications will be required to adequately accommodate resulting needs.

8. Overall, PRASA's revenues and expenses included in its Forecast for fiscal years 2012 through 2016 (included in Exhibit 1) are reasonable based on recent historical performance. Based on this Forecast, PRASA's should be able to comply with the Rate Covenant and the ABT requirements stipulated in the 2012 MAT. However, the probability of achieving this Forecast is conditioned on the following assumptions:

   - PRASA's ability to maintain its service revenues in a very challenging economic environment – Continued uncertainty and strain on the economy could cause further decline in the consumption patterns of PRASA customers and collections, resulting in further reductions in projected revenues. Hence, the YTD results for FY2012 should be closely monitored and projections for subsequent fiscal years shall be adjusted accordingly.
   - PRASA's ability to continue to successfully implement all of its operational initiatives – PRASA's financial forecast includes results from operational initiatives that have been described throughout this report. The financial forecast also includes certain revenue enhancing and cost reduction initiatives that are currently underway. MPPR/Malcolm Pirnie's conclusions regarding the Forecast assume the framework and execution of the

operational initiatives will not materially change; any changes could significantly alter the findings contained and presented in this report. Although PRASA has made a dedicated commitment to implement the initiatives described in this report, there is a possibility that the projected results and, more specifically, the timing of those results will not be achieved.

- PRASA's ability to secure other sources of revenue beyond FY2013 (after the initial funding of the Budgetary Reserve Fund has been depleted) – Starting in FY2014, compliance with the Rate Covenant and DSC requirements included in the 2012 MAT is contingent upon PRASA obtaining additional sources of revenues from the Budgetary Reserve Fund, as a result of future replenishments from the Central Government Fund or other sources of funding, or from the implementation of changes in its rate structure. The additional revenue requirements projected for FY2013, FY2014 and FY2015 amount to approximately $330M, $385M, and $420M, respectively. In the event the Budgetary Reserve Fund is depleted and not replenished with additional funding (i.e., with additional Central Government appropriations or other sources of funding), PRASA would be required to implement revenue enhancing and/or cost reduction measures, rate structure changes, or a combination of these actions, that would generate sufficient revenues to meet its DSC requirements. These additional measures would have to provide an equivalent percent increase in revenues of approximately 45% in FY2014, with additional increases of, approximately, 5% in FY2015, and 3% in FY2016.

EXHIBIT 1

	PRASA FINANCIAL PROJECTIONS PRO FORMA ($, Thousands)	FY2012 PROJECTION	FY2013 PROJECTION	FY2014 PROJECTION	FY2015 PROJECTION	FY2016 PROJECTION
	OPERATING REVENUES					
1	Service Collections					
2	Base Fee and Service Charges	$740,000	$730,000	$730,000	$730,000	$730,000
3	Operational Initiatives - Additional Billings	35,000	40,000	40,000	40,000	40,000
4	Operational Initiatives - Collections from Prior Years	25,000	20,000	20,000	4,000	5,000
5	Reserve for Uncollectible Accounts	(54,309)	(75,190)	(75,190)	(75,190)	(75,190)
6	PAN/TANF Subsidy	(4,000)	(4,000)	(4,000)	(4,000)	(4,000)
7	Subsidy to Public Housing	(12,000)	(12,000)	(12,000)	(12,000)	(12,000)
8	Miscelaneous Income	4,000	4,000	4,000	4,000	4,000
9	Special Assessments	5,000	3,000	3,000	3,000	3,000
10	Transfer from/(to) Rate Stabilization Account	-	-	-	-	-
11	**Total Operating Revenues**	**$738,691**	**$705,810**	**$705,810**	**$689,810**	**$690,810**
12	Other Sources of Revenue					
13	Transfer from Budgetary Reserve Fund	$95,000	$145,000	-	-	-
14	General Fund Contributions	70,264	-	-	-	-
15	Additional External Support/Other Measures/Rate Increases	-	-	330,000	385,000	420,000
16	**Total Other Sources of Revenue**	**$165,264**	**$145,000**	**$330,000**	**$385,000**	**$420,000**
17	**Total Authority Revenues (Line 11 + Line 15)**	**$903,955**	**$850,810**	**$1,035,810**	**$1,074,810**	**$1,110,810**
	OPERATING EXPENSES					
18	Payroll and Related	$283,493	$292,123	$296,819	$301,474	$307,954
19	Electric Power	175,000	180,250	185,658	191,227	196,964
20	Maintenance and Repair	42,652	43,932	45,250	46,607	48,005
21	Chemicals	30,000	30,900	31,827	32,782	33,765
22	Superaqueduct Service Contract	26,900	27,169	27,441	27,715	27,992
23	Insurance	12,410	12,782	13,166	13,561	13,968
24	Other Expenses	125,522	129,288	133,166	137,161	141,276
25	Special Projects Reserve	10,484	-	-	-	-
26	Capitalized Operating Expenses	(39,422)	(40,837)	(41,800)	(42,780)	(43,886)
27	**Total Operating Expenses**	**$667,039**	**$675,607**	**$691,527**	**$707,747**	**$726,038**
28	Total Senior Debt Service (S + SSUB + SUB)	$97,296	$90,600	$251,268	$269,606	$280,731
29	Revenues Available for Operating Expenses and Other Debt Service After Senior Debt Service	$806,659	$760,210	$784,542	$805,204	$830,079
30	Total Commonwealth Debt Service (CGI & CSO)	$137,363	$80,934	$84,593	$88,890	$95,495
31	**Net Authority Revenues After Operating Expenses and All Debt Service Obligations**	**$2,257**	**$3,669**	**$8,422**	**$8,567**	**$8,546**
	DEBT SERVICE					
	Senior (S)	$90,600	$90,600	$251,268	$269,606	$271,421
	Senior Subordinated (SSUB)	6,696	-	-	-	9,310
	Subordinated (SUB)	-	-	-	-	-
	Commonwealth Guranteed Indebtednes (CGI)	109,649	80,934	84,593	87,296	86,496
	Commonwealth Supported Obligations (CSO)	27,714	-	-	1,594	8,999
	Total Debt Service	**$234,659**	**$171,534**	**$335,861**	**$358,496**	**$376,226**

*Numbers may not add up due to rounding

EXHIBIT 1

	PRASA FINANCIAL PROJECTIONS PRO FORMA DEBT SERVICE COVERAGE AND ADDITIONAL BOND TESTS ($, Thousands)	FY2012 PROJECTION	FY2013 PROJECTION	FY2014 PROJECTION	FY2015 PROJECTION	FY2016 PROJECTION
1	Operating Revenues	$738,691	$705,810	$705,810	$689,810	$690,810
2	Other Sources of Revenue	165,264	145,000	330,000	385,000	420,000
3	Authority Revenues (Line 1 + Line 2)	$903,955	$850,810	$1,035,810	$1,074,810	$1,110,810
4	Operating Expenses	$667,039	$675,607	$691,527	$707,747	$726,038
	Senior Debt					
5	**Senior**					
6	Annual Debt Service	$90,600	$90,600	$251,268	$269,606	$271,421
7	DS Coverage Required = 2.50	8.15	7.79	2.81	2.56	2.55
8	Maximum Annual Debt Service	$230,792	$254,711	$271,422	$271,422	$271,422
9	ABT Coverage Required = 2.50	3.20	2.77	2.60	2.54	2.55
10	**Senior & Senior Subordinated**					
11	Annual Debt Service	$97,296	$90,600	$251,268	$269,606	$280,731
12	DS Coverage Required = 2.00	7.59	7.79	2.81	2.56	2.46
13	Maximum Annual Debt Service	$230,792	$254,711	$271,422	$281,024	$292,747
14	ABT Coverage Required = 2.0	3.20	2.77	2.60	2.45	2.36
15	**Senior, Subordinated Subordinated & Subordinated**					
16	Annual Debt Service	$97,296	$90,600	$251,268	$269,606	$280,731
17	DS Coverage Required = 1.50	7.59	7.79	2.81	2.56	2.46
18	Maximum Annual Debt Service	$230,792	$254,711	$271,422	$281,024	$292,747
19	ABT Coverage Required = 1.50	3.20	2.77	2.60	2.45	2.36
20	Net Authority Revenues	$806,659	$760,210	$784,542	$805,204	$830,079
21	Total Operating Expenses	667,039	675,607	691,527	707,747	726,038
22	Net Authority Revenues Available for Other Debt	$139,620	$84,603	$93,015	$97,457	$104,041
	Other Debt					
23	**Commonwealth Guaranteed Indebtedness**					
24	Annual Debt Service	109,649	80,934	84,593	87,296	86,496
25	DS Coverage Required = 1.00	1.27	1.05	1.10	1.12	1.20
26	**Commonwealth Supported Obligations**					
27	Annual Debt Service	27,714	-	-	1,594	8,999
28	DS Coverage Required = 1.00	1.02	1.05	1.10	1.10	1.09
29	Total Annual Debt Service	$234,659	$171,534	$335,861	$358,496	$376,226
30	**Net Authority Revenues After Operating Expenses and All Debt Service Obligations**	**$2,257**	**$3,669**	**$8,422**	**$8,567**	**$8,546**
31	**Total Authority Revenues / All Obligations (Operating Expenses + Debt Service)**	**1.00**	**1.00**	**1.01**	**1.01**	**1.01**

*Numbers may not add up due to rounding

1 Introduction

1.1 Introduction

MP Engineers of Puerto Rico, PSC and its subcontractor Malcolm Pirnie, Inc. (MPPR/Malcolm Pirnie), as Consulting Engineer of the Puerto Rico Aqueduct and Sewer Authority (PRASA), has been retained to prepare this Supplemental Report in support of PRASA's 2012 issuance of new debt. The proceeds of the 2012 issuance will be used by PRASA to mainly (i) refinance certain lines of credits (LOCs) and bond anticipation notes (BANs), (ii) fund a portion of the cost of its Capital Improvement Program (CIP), (iii) provide initial funding for the Budgetary Reserve Fund, (iv) establish a deposit for capitalized interests, (v) pay for expenses related to the issuance of the Senior Lien Revenue Bonds, and (vi) provide additional financial liquidity to PRASA.

Since 2008, MPPR/Malcolm Pirnie have been retained by PRASA to assist in satisfying several requirements of the 2008 Master Agreement of Trust (2008 MAT) between PRASA and the Trustee with bondholders. MPPR/Malcolm Pirnie understands that PRASA entered into the 2008 MAT to enable it to issue revenue bonds and incur other indebtedness to partially finance its CIP and to repay and refinance existing debt. MPPR/Malcolm Pirnie prepared a Consulting Engineer's Report (CER) on January of 2008 (2008 CER) to document and assess technical, operational and financial issues and related matters of PRASA's water and wastewater systems (the System). The 2008 CER was included in PRASA's Official Statement (OS) related to its March 2008 bond issuance.

MPPR/Malcolm Pirnie, as the Consulting Engineer, prepared a CER for fiscal years 2009 and 2010 to document the condition and changes, if any, in PRASA's operation and the performance of the System, a requirement of the 2008 MAT. In March of 2010, MPPR/Malcolm Pirnie issued the 2009 CER, which covered the period from July 1, 2008 to June 30, 2009. Subsequently, the 2010 CER, which covers the period from July 1, 2009 to June 30, 2010, was issued in February of 2011.

This Supplemental Report presents MPPR/Malcolm Pirnie's opinion with respect to the technical, operational and financial issues and related matters of PRASA's System through November 30, 2011. Any statements in this CER involving estimates or matters of opinion, whether or not so specifically designated, are intended as such, and not as representations of fact. MPPR/Malcolm Pirnie has not independently verified the accuracy of the reports and other information indicated as being provided by PRASA for the conduct of this assignment. To the extent that the information provided to MPPR/Malcolm Pirnie by PRASA is not accurate, the conclusions and recommendations contained in this CER may vary and are subject to change. Changed conditions occurring or becoming known after the issuance of or beyond the period covered by this Supplemental Report could affect the material presented to the extent of such changes.

MPPR/Malcolm Pirnie has no responsibility for updating this report for changes that occur beyond the date of its issuance.

1.2 Conventions

PRASA's fiscal year begins on July 1st and ends June 30th. Throughout this Supplemental Report, fiscal year is identified as "FY" followed by the calendar year in which the fiscal year ends, i.e., FY2012 is the fiscal year from July 1, 2011 through June 30, 2012.

1.3 Acronyms

A listing of acronyms or abbreviations of terms used in this report is included in the Table of Contents.

2 Condition of System

2.1 Introduction

PRASA is a public utility responsible for the production and distribution of potable water and collection, treatment, and disposal of a large portion of domestic and industrial pretreated wastewaters in Puerto Rico. PRASA serves a population of approximately 3.7 million residents[1] plus approximately 5 million visitors annually[2]. PRASA can be considered a monopoly since it is the only water and wastewater utility in Puerto Rico, providing water and wastewater service to about 97% and 59% of Puerto Rico's population, respectively. While this is positive in terms of sales of services it also makes PRASA a critical entity for the wellbeing of Puerto Rico. The effective operation of this vital public service is essential to the health and economic prosperity of Puerto Rico and its citizens.

PRASA provides water and wastewater service throughout the island, which has an approximate area of 3,535 square miles. Due to the fact that Puerto Rico is an island with varied topography, isolated demographic distributions, and a diverse mix of users, PRASA has a somewhat fragmented and localized system of water sources, treatment systems and delivery systems. As a result, PRASA has many more treatment facilities than most utilities serving a similar number of customers. This results in a higher degree of diversity in PRASA's assets in terms of size, treatment technologies, and age when compared to systems in the United States (U.S.) and Canada, which tend to have more centralized systems with larger regional facilities. These facts add complexity to the management of the System and contribute to higher operation and maintenance (O&M) costs compared to other utilities serving similar populations. At the time of this assessment and based on PRASA's updated Geographic Information System (GIS) database, as of FY2011 PRASA operates eight regulated dams, 126 water treatment plants (WTPs), 54 wastewater treatment plants (WWTPs), 1,182 water pump stations (WPSs), 1,004 wastewater pumping stations (WWPSs), 299 wells, and 1,723 water storage tanks.

2.2 FY2010 Asset Condition Results

In FY2010, MPPR/Malcolm Pirnie assessed the condition of PRASA's System through an inspection program of a sample that included the major elements of PRASA's System. The purpose of these inspections was to identify the overall condition of the facilities to determine if they are being operated and maintained in a manner to achieve their operating goals and to evaluate if PRASA's CIP is aligned with identified needs. These inspections were performed from January 28, 2010 through March 16, 2010.

[1] 2010 United States Census
[2] Source: Puerto Rico Tourism Company statistics for fiscal years 2004 through 2009.

Tables 2-1 and 2-2 present the categories of PRASA's assets that were inspected as part of this CER, along with the total quantity of PRASA assets, number of facilities inspected, and percent of total facilities inspected. The quantity of PRASA assets included in the tables below is based on the latest data obtained from PRASA's GIS database. These numbers vary from those reported in previous years given that PRASA continues to digitize and incorporate both existing and new infrastructure data. As it is expected from any GIS, this information will fluctuate from year to year as a result of its further development and expansion, and the deletions and additions of assets to the System.

As shown in Table 2-1, all regulated dams were inspected, due to the value of these individual assets. Approximately 50% of the WTPs and WWTPs were inspected. Those inspected were facilities that served a considerable amount of clients and/or that had a lower rating in previous inspections conducted for and reported in the 2008 and 2009 CERs. The remaining 50% was not inspected since in the two previous inspections they had good or adequate ratings. As shown in Table 2-2, only a portion of the wells, pump stations and storage tanks (minor facilities) were inspected because of their lower individual facility value.

Table 2-1:
Large Value Assets (Major Facilities) Inspected by Asset Category

Asset Category	Total PRASA Facilities	Inspections Performed	
		Quantity	Percent
Regulated Dams	8	8	100%
Water Treatment Plants	127	67	53%
Wastewater Treatment Plants	60	30	50%
Total	195	105	54%

Table 2-2:
Lower Value Assets (Minor Facilities) Inspected by Asset Category

Asset Category	Total PRASA Facilities	Inspections Performed	
		Quantity	Percent
Wells	299	39	13%
Water Pump Stations	1,182	52	4%
Water Storage Tanks	1,723	54	3%
Wastewater Pump Stations	1,004	51	5%
Total	4,208	196	5%

In total, 301 inspections were performed out of a total of 4,403 facilities. Furthermore, it should be noted that no inspections were performed on the following assets: small dams and weirs, buried infrastructure, meters, ocean outfalls, buildings, land, and other ancillary facilities.

2.2.1 Inspections Methodology

Inspections were performed throughout PRASA's five operational Regions. To ensure consistency between inspections performed in 2008, 2009 and 2010, MPPR/Malcolm Pirnie utilized the same inspection forms used for the 2008 and 2009 CERs with some minor modifications. To standardize documentation and ratings, new inspectors were trained by MPPR/Malcolm Pirnie's water and wastewater experts who also participated in the 2009 CER.

An attempt was made to obtain a representative sampling of the minor facilities by inspecting a large number of facilities within several focused Operational Areas across the island. The Operational Areas selected were those with a greater number of clients (Caguas, Ponce, Arecibo, Mayagüez, and San Juan). As the specific assets to be inspected were not pre-determined, this approach provided some assurance that MPPR/Malcolm Pirnie would not be inspecting only the best assets in an Operational Area. Upon arrival to a specific Operational Area, PRASA representatives guided inspectors to a selection of the minor facilities within their Operational Area.

Table 2-3 shows the number of facilities inspected within each Region. Because the Metro Region has fewer, but larger, WTPs and WWTPs (100% of which were inspected) compared to the other Regions, the total number of inspections in the Metro Region is less than in the other Regions. However, the Metro Region was inspected to an overall level consistent with the other Regions.

Table 2-3:
Summary of Inspections by Region

Higher Value/Major Facilities						
Asset Category	**East**	**Metro**	**North**	**South**	**West**	**Total**
Regulated Dams	3	2	1	1	1	**8**
Water Treatment Plants	15	5	16	16	15	**67**
Wastewater Treatment Plants	7	3	6	7	7	**30**
Subtotal Higher Value Facilities	**25**	**10**	**23**	**24**	**23**	**105**
Lower Value/Minor Facilities						
Asset Category	**East**	**Metro**	**North**	**South**	**West**	**Total**
Wells	1	0	17	11	10	**39**
Water Pump Stations	11	10	12	10	9	**52**
Water Storage Tanks	10	11	13	11	9	**54**
Wastewater Pump Stations	11	9	11	10	10	**51**
Subtotal Lower Value Facilities	**33**	**30**	**53**	**42**	**38**	**196**
Total Inspected Facilities	**58**	**40**	**76**	**66**	**61**	**301**

As in previous CERs, each category of asset was inspected using an inspection form, criteria, and criteria weighting customized to that specific asset category. The evaluation criteria were chosen from the following list for each asset inspection.

- Compliance– degree to which the performance of the asset is in compliance with its permit limits and regulatory requirements.
- Equipment / Maintenance – assessment of the adequacy of the maintenance practices and the condition of the facility.
- Operations / Process Control – degree to which asset condition and features allow it to be operated and controlled to meet its performance objectives.
- Staffing / Training – assessment of the adequacy of facility staffing coverage and training.

Within each of the evaluation criteria, the asset inspected was assigned a numerical rating between zero and three ("0-3"). An overall facility rating was then determined based on the calculation of a weighted average of the ratings for each criterion. The numerical ratings are described below:

Rating	Range
Good (Most of the criteria are adequately addressed)	2.5 – 3.0
Adequate (Many of the criteria are adequately addressed)	1.5 – 2.4
Poor (Many of the criteria are not adequately addressed)	0.5 – 1.4
Unacceptable (Most of the criteria are not adequately addressed)	0.0 – 0.4

A summary of the inspection results for each asset category is discussed below.

2.2.2 Inspection Results

Based on the most recent facility inspections performed between January and March of 2010, the condition of the facilities visited varied from new to those requiring capital upgrades. The following facilities, particularly, required immediate attention from PRASA, as outlined in the 2010 CER:

- Isabela Regulator Lake required maintenance of the geomembrane liner to avoid a potential reduced lifespan for the facility.
- Three WTPs were rated poor in overall condition (San Germán, Cedro Arriba and Caguas Norte), mainly due to compliance violations (CFE Turbidity, Total Coliform and HAA) and lack of sludge treatment.
- Five WWTPs (Vega Baja, Guayama, Ponce, Yauco and Sabana Grande) out of 30 were rated poor due to issues associated with compliance and Operations/Process Control; Vega Baja received the lowest rating (1.1); the facility has three treatment process trains and needs improvement in the operational strategy for process control.

PRASA's operations and infrastructure personnel have indicated that they have defined new projects or actions to address the majority of these issues. These are expected to be addressed either through PRASA's CIP (with existing or future projects) or directly by the Operational Regions through the O&M improvement program.

Compliance with discharge permit limits and drinking water standards varied greatly depending on the plant age and condition, and experience of the operators. A number of PRASA's WTPs and WWTPs are included in the 2006 United States Environmental Protection Agency (USEPA) Consent Decree and the 2010 Puerto Rico Department of Health (PRDOH) Agreement, and some of these facilities are either scheduled for closure (through consolidation to regional facilities) or have ongoing or planned capital improvements to address compliance problems and/or increase treatment capacity.

Despite some compliance problems, the System is producing and delivering potable water and conveying and treating wastewater. The condition of many facilities is not entirely unexpected, due to historically insufficient commitment of capital and operational resources (prior to FY2006). The planned capital programs along with the O&M improvements are generally in alignment with the System needs, although the needs of PRASA's buried infrastructure (i.e. water and sewer pipelines) must be assessed to better identify measures to improve performance. Annual results for leak and overflow metrics show that PRASA should look into the causes of its high reported frequency and duration of these events so that corrective measures can be implemented and performance is improved. The table below offers a comparison of the average result for each facility type for each fiscal year in which facility inspections were performed; for additional information please refer to the 2010 CER.

Table 2-4:
Summary of Inspections by Facility Type

Fiscal Year	Facility Type (Score)						
	Dams	WTPs	WWTPs	Wells	WPS	Tanks	WWPS
2008	2.3	2.2	1.9	2.0	2.2	1.9	1.7
2009	2.1	2.4	2.0	1.9	2.2	1.6	2.0
2010	2.3	2.3	2.0	2.1	2.3	1.6	2.0

2.2.3 Buried Infrastructure

Although buried infrastructure (i.e. water mains, buried valves, sewer mains, manholes, etc.) was not inspected, the following sections provide some discussion regarding indirect indicators of the condition of these assets. PRASA continues to update its GIS database as infrastructure projects are completed and as additional information is obtained regarding existing infrastructure. Furthermore, PRASA has used this data to conduct hydraulic models of specific service areas in the Metro, East and West Regions to identify optimization opportunities in the System. PRASA

continues with its buried infrastructure renovation and replacement (R&R) program. Pipe R&R, which targets pipe break and leak-prone areas, are identified by PRASA's Operational Areas and prioritized according to severity of the problem. PRASA plans to continue replacing and repairing piping in order to bring the System to optimal operating conditions.

2.2.3.1 Non-Revenue Water

Non-Revenue Water (NRW) is water that has been produced but is not billed to customers. NRW consists of two main components: commercial (apparent) losses and physical (real) losses as shown in the water balance summary presented in Figure 2-1. For purposes of this report, NRW is defined as follows:

$$NRW = \frac{(\text{volume produced} - \text{volume billed})}{\text{volume produced}}$$

Figure 2-1: Water Balance Summary

<table>
<tr><td rowspan="8">System Input Volume (Dispatched Water)</td><td rowspan="4">Authorized Consumption</td><td rowspan="2">Billed Authorized Consumption</td><td>Billed Metered Consumption</td><td rowspan="2">Accounted for Water</td><td rowspan="2">Revenue Water</td></tr>
<tr><td>Billed Unmetered Consumption</td></tr>
<tr><td rowspan="2">Unbilled Authorized Consumption</td><td>Unbilled Metered Consumption</td></tr>
<tr><td>Unbilled Unmetered Consumption</td><td rowspan="7">Unaccounted for Water</td><td rowspan="7">Non-Revenue Water</td></tr>
<tr><td rowspan="4">Water Losses</td><td rowspan="3">Commercial Losses

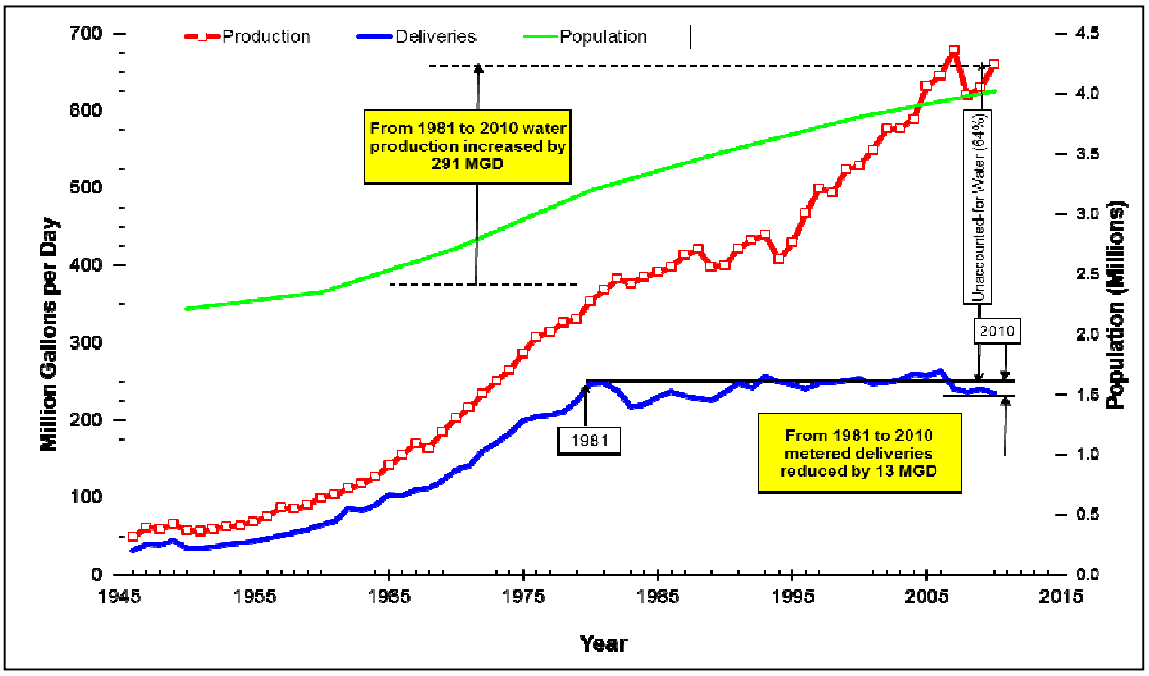
(Apparent Losses)</td><td>Unauthorized Consumption (theft)</td></tr>
<tr><td>Customer Metering Inaccuracies</td></tr>
<tr><td>Data Handling (Billing) Errors</td></tr>
<tr><td rowspan="3">Physical Losses

(Real Losses)</td><td>Main Line Leakage</td></tr>
<tr><td>Storage Tank Overflows</td></tr>
<tr><td>Service Connection Leakage</td></tr>
</table>

Source: American Water Works Association and International Water Association

Historically, PRASA's NRW has increased as water production has increased. As illustrated in Figure 2-2 below, PRASA's NRW has dramatically increased over the past 25 years.

Figure 2-2: PRASA Production and Delivery of Water



As summarized in Table 2-5 below, for the past seven fiscal years PRASA has annually billed, on average, over 330 million cubic meters of water to customers. This amount represents approximately 39% of PRASA's annual water production. The remaining water produced is NRW, which has varied from 62% in FY2007 to 64% in FY2011. Based on the water consumptions calculated by CDM Caribe in the report titled "Update of Puerto Rico Water Demand Forecast", it was estimated that 15% of produced water is NRW due to commercial losses, whereas the other 49% is due to physical losses. The commercial losses are the difference between the water consumption estimated by CDM and the water consumption invoiced by PRASA. The physical losses are the difference between the water production and the consumption estimated by CDM.

Table 2-5:
Water Sales and NRW

Fiscal Year	Water Sales by Client Type (m^3)					Estimated Total Water Produced (m^3)	Non-Revenue Water (m^3)	Volume NRW as Percentage of Total Water Production
	Residential	Commercial	Industrial	Government	Total			
2007	263,088,570	42,712,379	11,858,269	32,653,127	350,312,345	934,019,760	583,707,415	62%
2008	244,623,520	41,160,542	11,952,555	28,867,287	326,603,904	857,109,800	530,505,896	62%
2009	246,561,753	41,628,183	11,575,856	31,058,569	330,824,361	893,225,775	562,401,414	63%
2010	244,324,000	38,284,000	9,807,000	32,757,000	325,172,000	910,487,463	585,315,463	64%
2011	236,658,000	40,204,000	13,837,000	33,459,000	324,159,000	892,569,179	568,410,179	64%
5-Year Average	243,041,818	40,797,821	11,806,136	31,758,997	331,414,322	897,482,395	566,068,073	**64%**

Source: PRASA customer and billing database. Numbers may not add up due to rounding

Based on a comparison to other utilities in the U.S. and Canada, PRASA's NRW volume is extremely high. In the most recent utility survey available at the time this CER was being prepared, the distribution system water losses median for all survey participants ranged from 8.5% to about 9.9%[3].

As indicated above, PRASA's NRW falls well outside the normal range for this performance metric. PRASA management recognizes this amount of NRW is unacceptable and has designated this as a top improvement priority. PRASA also recognizes that if it can reduce NRW, it will increase revenue, reduce O&M expenses, and reduce the need for capital improvements to increase water supply. Therefore, PRASA is developing and implementing a series of actions to address the primary contributors of these water losses. These initiatives are further described in Section 3 of this Supplemental Report.

2.2.3.2 Leaks and Overflows

Annual results for leak and overflow metrics show that PRASA should look into the causes of its high reported frequency and duration of these events so that corrective measures can be implemented and performance is improved. Possible adjustments to PRASA's buried infrastructure R&R budget, as well as an evaluation of available staff resources to perform repairs, may be necessary to improve performance levels regarding number and duration of leaks and overflows. Also, PRASA should evaluate and revise its data processing and collection practices regarding reported and repaired leaks and overflows.

2.3 Year-to-Date System Condition Status

In connection with the intended 2012 bond issuance, MPPR/Malcolm Pirnie performed interviews with PRASA's Operational Regional Directors in order to obtain information regarding any material changes that may have occurred since the last facility inspections were conducted. As of November 30, 2011, PRASA reports no material changes on the condition of the System. Overall, PRASA reports that the System continues to adequately produce and distribute water, and convey, treat and discharge wastewater.

Although no material changes are reported, PRASA reports that the following facilities/systems have been identified as needing immediate repairs/rehabilitation:

- Carolina Regional WWTP – Requires general equipment improvements and/or rehabilitation.
- Caguas Regional WWTP – Several additional improvement needs have been identified including: rehabilitation or replacement of degritters, blowers, and emergency generators.
- Mayagüez WWTP – Requires additional improvements and equipment rehabilitation

[3] Source: Benchmarking Performance Indicators for Water and Wastewater Utilities: 2007 Annual Survey Data and Analyses Report, published by the AWWA (2008).

PRASA's operations and infrastructure personnel have indicated that they have defined new projects or actions to address the majority of these issues. These are expected to be addressed either through PRASA's CIP (with existing or future projects) or directly by the Operational Regions through the O&M improvement program. This information has not been independently validated by the Consulting Engineer.

PRASA reports to having improved its leaks and overflow metrics. Additionally, PRASA operations personnel indicated concerns with several recent wastewater trunk sewer collapses. These collapses have occurred mostly during high rain events on aging infrastructure (concrete piping installed over 25 years ago). As part of its R&R program, PRASA has allocated budget to the replacement of certain trunk sewers; however, the required budgeted amount in future years may need to increase as the buried infrastructure continues to age.

2.3.1 Conclusions

The condition of the facilities visited for the 2010 CER varied from new to those requiring capital upgrades. The condition of most facilities with implemented CIP projects improved from FY2009 to FY2010. However, certain facilities were operating out of compliance with discharge permit limits and drinking water standards. Despite these compliance problems, the facilities are generally producing and delivering potable water and conveying and treating wastewater to a level of competency. PRASA demonstrates a thorough understanding of the System shortcomings and continues to work towards correcting them.

With the exception of certain facilities that require equipment rehabilitation or replacement, through November 30, 2011, PRASA reports no material changes to the condition of the System reported in the 2010 CER. MPPR/Malcolm Pirnie has not independently validated this information through facility inspections.

3 O&M Practices and Operational Initiatives

3.1 Introduction

As detailed in the 2010 CER, MPPR/Malcolm Pirnie assessed the adequacy of PRASA's O&M practices based on compliance with regulatory requirements, interviews with PRASA personnel and facility observations by field inspectors, etc. As concluded, based on the information evaluated for the 2010 CER, PRASA's O&M practices are adequate. However, two key findings of these facility inspections identified the need for facility-specific O&M plans or manuals for treatment plants and for standardized process for prioritizing, scheduling, and executing preventive, corrective and routine maintenance activities.

With the objective of developing a model operating standard for its plant facilities, PRASA began the development of the "Ideal Plant" initiative in FY2012. Based on the results of comprehensive audits at each facility, PRASA looks to identify and cost-effectively address facility-specific shortcomings in the following areas:

- Infrastructure
- Compliance
- Staff and training
- Operations and process controls
- Risk management and safety
- Documentation (i.e., O&M plans)

As of the date of this report, PRASA has conducted facility audits in six WWTPs and three WTPs (completed in December of 2011). Of the nine audited facilities, PRASA has selected four WWTPs (Caguas, Fajardo, Humacao and Aguadilla) to develop detailed optimization plans. These plans are expected to be completed by March of 2012 and their corresponding implementation, with the exception of any capital intensive improvements that may be required, is expected to be completed by September of 2012. PRASA expects to replicate the process in all of its treatment facilities in order to develop and implement optimization plans over the next five years.

Although PRASA has made an effort to reduce its O&M costs (as demonstrated through its reduction in payroll and benefits, later discussed), PRASA experienced an increase of approximately $28M in FY2011 over FY2010 results due to higher costs in electricity, maintenance and repair, and other expenses such as professional services and materials and

supplies. For FY2012, PRASA budgeted O&M expenses for the water and wastewater system (combined) in the order of $583M[4]. PRASA estimates that approximately 70% of its O&M budget is allocated for the water service system and the remaining 30% to the wastewater service system. Hence, approximately $408M is allocated for the water system and the remaining $175M to the wastewater system. Estimated costs per million gallons and per customer account are summarized in the table below.

Table 3-1:
PRASA FY2012 O&M Budget Metrics

Metric	Water System		Wastewater System	
	PRASA	Benchmark[1]	PRASA	Benchmark[1]
Total FY2012 Budget	$408M	-	$175M	-
Cost per Account[2]	$316.20	$258.00	$230.41	$213.00
Cost per MG produced[3]/treated[4]	$1,731.00	$1,459.00	$2,101.93	$2,022.00

[1]Source: Benchmarking Performance Indicators for Water and Wastewater Utilities: 2007 Annual Survey Data and Analyses Report, AWWA (2008).
[2]Based on number of accounts at the end of FY2011 of 1,290,800.
[3]Based on FY2011 total production and distribution of approximately 646 million gallons per day (MGD) of potable water.
[4]Based on FY2011 total treatment of approximately 228 MGD of wastewater.

When compared to the median values for utilities in the U.S., these operational and cost metrics seem to be higher than average. However, this is not a surprising result considering the size and complexity of the System; PRASA's high staffing levels, which translate into high payroll and benefits costs; and high electricity costs.

PRASA has continued to undertake numerous operational initiatives designed to enhance revenues and reduce O&M costs. MPPR/Malcolm Pirnie has reviewed these initiatives in order to understand their current status and validate how their corresponding results will impact PRASA's financial projections for FY2012 through FY2016, later discussed.

3.2 Non-Revenue Water Reduction Program (Revenue Optimization Program)

In May 2008, PRASA began to implement a comprehensive Non-Revenue Water (NRW) Reduction Program to reduce water losses (apparent and real), increase revenue, reduce operational costs, and minimize water infrastructure capital investments. Reducing non-revenue water continues to be a high priority goal. As part of the NRW Reduction Program, PRASA's

[4] Excludes approximately $70M related to commercial activities and provision of customer services, including but not limited to: staffing and operation of customer service offices island-wide; meter reading; connection and disconnection services; invoice preparation, printing and distribution; customer service call centers; and water meter purchases, amongst others.

strategy has focused mostly on revenue optimization (enhancing) initiatives, which target apparent losses related to its commercial operation. These initiatives, which together make up the Revenue Optimization Program, have resulted in significant additional revenue for PRASA over the past three fiscal years.

As shown in the figure below, both in FY2010 and FY2011 PRASA exceeded its budgeted amount for operational initiatives. In FY2011 PRASA collected approximately $74.6 million (M) in operational initiatives, 14.8% higher than the FY2011 approved budget amount of $65M. In FY2010, PRASA collected $67.3M through its NRW Reduction Program, $19.3M more than the budgeted amount.

Figure 3-1: Revenue Optimization Program Results FY2009-FY2011 ($, Millions)

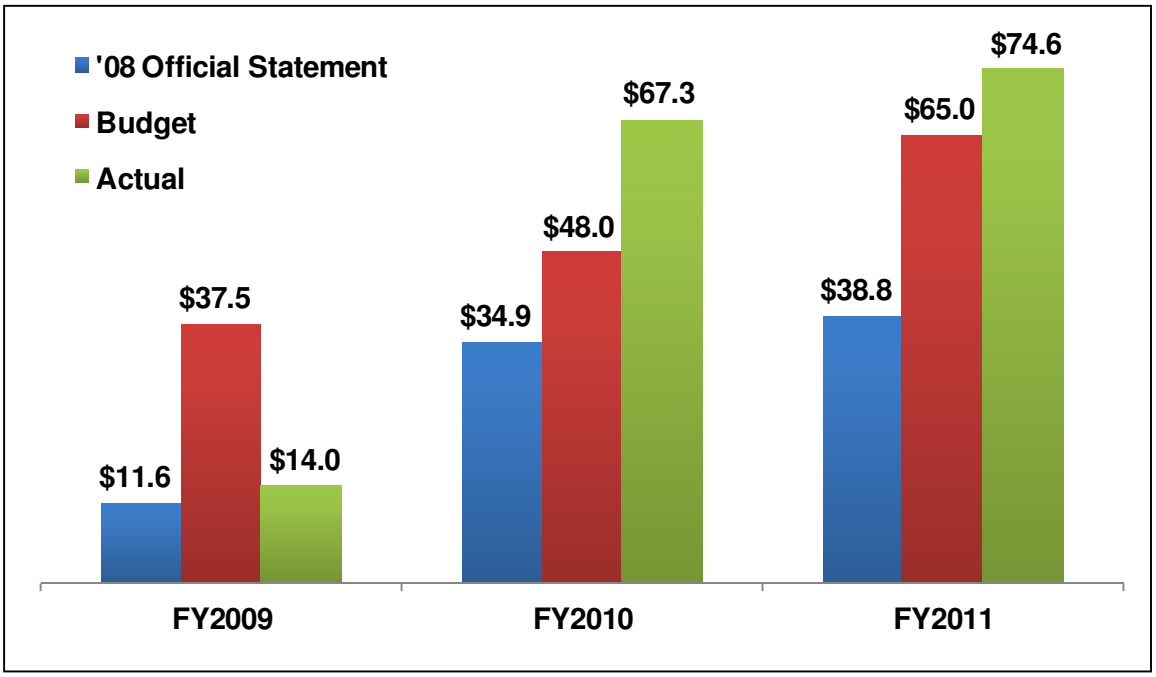


Table 3-2 presents a breakdown of the Revenue Optimization Program initiatives, their respective revenue impact budgeted for FY2012 and estimated annual benefits for FY2013 through FY2016.

Table 3-2:
Revenue Optimization Program Initiatives –
FY2011 – FY2016 ($, Thousands)

Initiative	FY 2011 Results	FY 2012 Budget	FY2013 Projection	FY2014 Projection	FY2015 Projection	FY2016 Projection
Small Meters	$21,798	$27,285	$31,318	$33,574	$34,431	$35,216
Degradation	(7,000)	(7,000)	(7,000)	(7,000)	(7,000)	(7,000)
Large Meters	14,118	7,467	7,801	7,011	6,433	5,813
Theft and Tx[1] Accounts	16,801	7,902	8,715	7,729	3,661	3,661
Sprinklers	1,564	1,406	1,549	882	882	882
Collection Management	1,956	1,250	625	625	-	-
Disconnections	20,090	15,950	13,750	11,550	-	-
Inactive Accounts	768	320	320	-	-	-
Class Correction	399	2,372	2,488	2,488	2,488	2,488
Condominiums	1,006	2,037	2,037	2,037	2,037	2,037
Miscellaneous	3,114	1,353	1,353	-	-	-
Total	**$74,613**	**$60,341**	**$62,956**	**$58,896**	**$42,932**	**$43,097**

[1] Inactive customer accounts with consumption.

A description of each of the NRW Operational Initiatives, and underlying assumptions regarding their projected revenue impact is discussed below.

1) **Small Meters**: This operational initiative consists of replacing meters less than 1- inch in diameter that are more than 10 years old, as these meters lose precision and account for less water than is delivered. By replacing them, PRASA increases billed consumption and improves revenues. Every year there is a cumulative revenue effect from meters previously changed as well as a revenue loss due to the slow degradation of an aging meter's accuracy. This degradation is accounted for in the calculation of the operational initiatives revenues.

   PRASA staff informed the Consulting Engineer that approximately 120,000 meters were replaced in FY2009, 138,000 in FY2010, and 48,000 in FY2011. The FY2011 revenues (minus adjustment for degradation) collected from this initiative were $14.8M. PRASA estimates 90,000 small meters will be replaced in FY2012 at a capital cost of approximately $10M. For future fiscal years, PRASA is projecting annual small meter replacements of approximately 70,000 each year, at a capital cost of approximately $8M to $10M in each year.

   MPPR/Malcolm Pirnie finds this projection reasonable based on the number of meters already replaced and past performance of this initiative. The average additional monthly revenue per meter for the December 2010 to May 2011 period was approximately $7.85 per meter, which is $0.60 higher than the average of $7.25 assumed by PRASA. MPPR/Malcolm

Pirnie recommends that the collection rate assumed in this operational initiative be closely monitored.

2) **Large Meters**: This operational initiative consists of replacing meters with a diameter equal to or greater than 1-inch. This initiative generates revenues from the additional billed consumption due to better accuracy of the meters and retroactive fines assessed to customers that present abnormally higher consumption than the average previous to the replacement of the meter.

   Over the last three fiscal years PRASA has replaced a total of 1,915 large meters: 908 in FY2009, 517 in FY2010, and 845 in FY2011. In FY2011, PRASA had additional billed revenues from this initiative of $14.1M. The average additional monthly revenue per meter for the December 2010 to June 2011 period was approximately $284.91 per meter, which is $5.91 higher than the average assumed by PRASA of $279.00. In FY2012, PRASA estimates 600 large meters will be replaced. The total projected additional revenue from these meter replacements, combined with the revenues from the meter replacements performed in FY2009 through FY2011 amounts to $7.5M. PRASA estimates that an additional 1,600 large meters will be replaced between FY2013 and FY2016. MPPR/Malcolm Pirnie finds these projections reasonable based on the number of meters already replaced and past performance of this initiative.

3) **Theft**: The intervention of theft accounts initiative focuses on converting connected and non-paying customers into paying customers. This includes: 1) Tx accounts (inactive accounts with consumption), which specifically targets customer accounts currently included in PRASA's database categorized as inactive with recorded consumption (also referred to as water theft in inactive accounts); and 2) active accounts with irregularities (i.e., direct connections and meter tampering). This initiative leverages a database desktop exercise to target the potential customers that are currently benefiting from PRASA's services but are not paying for them.

   PRASA visited 45,000 targeted customers in FY2010 of which 7,503 (17%) were found to be using service without paying. PRASA activated these accounts and assessed a penalty of $1,200 per Tx account. In FY2010, PRASA collected $11M in revenues related to theft of water, $1M above the budgeted amount. In FY2011 PRASA visited 80,000 accounts, of which approximately 10,500 were normalized and are now billed on a regular basis. This represented approximately $16.8M in additional revenues collected by PRASA through this initiative. In FY2012, PRASA has included in its budget additional revenues from this initiative in the amount of $7.9M. Also, PRASA included in the Forecast additional revenues from this initiative that start at $8.7M in FY2013 and reduce down to $3.7M in FY2016. The reduction is mainly due to the fact the number of Tx accounts diminishes on an annual basis, until there are no more significant opportunities within this program. MPPR/Malcolm Pirnie finds these projections reasonable.

4) **Fire Protection and Sprinkler Initiative**: PRASA currently provides fire protection sprinkler service to only 820 accounts. PRASA has targeted commercial customers required by coding specification to have a sprinkler system that are not paying for the service. In FY2009 and FY2010, PRASA visited 3,429 targeted customers, of which 604 accounts were found to be out of compliance. Of these accounts, PRASA fined 389 customers $10,000 per account, collecting revenues of $3.7M. PRASA visited 264 additional targeted customers in FY2011, which represent additional revenues in the amount of $1.6M. This amount is slightly below the $2.4M target included in the FY2011 budget. This difference is mainly due to slower than expected collections and implementation of this initiative. However, PRASA is expecting to ramp up the implementation during FY2012.

   In FY2012 and FY2013, PRASA plans to visit 150 customers each year and is expecting to collect approximately $1.4M in additional revenue each year. PRASA is targeting chain stores, local supermarket chains, and restaurants, amongst others.

5) **Collection Management and Disconnections**: These initiatives focus on reducing uncollected accounts and ensuring customers pay on time. In a proactive approach, collection management consists of contacting residential, commercial, industrial and government customers with past due bills; disconnection consists of shutting-off service once a customer's bill is 60 days past due.

   Disconnections have been the major factor contributing to revenues collected under these initiatives. PRASA collected approximately $35M in disconnection revenue by the end of FY2010, over three times the budget amount for that fiscal year. In FY2011 PRASA collected $22M. In FY2012, PRASA is projecting $17.1M in additional revenues. In FY2013 and FY2014 the revenue opportunity reduces to approximately $625,000 each year. After that, PRASA is assuming that no additional revenues will be generated through this program.

6) **Other miscellaneous operational initiatives include:** rate classification/categorization (class and meter size) corrections, condominium service connection fees and charges, and other miscellaneous efforts. In FY2011, PRASA collected $4.5M of the $7.8M budgeted. In FY2012, PRASA is budgeting additional revenues in the amount of $4.7M. In FY2013 through FY2016, PRASA is projecting additional revenues, on average, of $4.5M each year.

   The FY2011 difference in the rate classification/categorization initiative is due in part to slower than expected implementation of this initiative, which targets water and wastewater customers who are incorrectly categorized in PRASA's database. PRASA has already identified the accounts to be intervened and, therefore, expects to ramp up this initiative in FY2012. The difference in the condominium service connection fees and charges is due to an

overestimation of the number of condominiums that were not being billed by PRASA. PRASA has corrected this, and has identified 301 condominiums that are currently not being billed consistently by PRASA. PRASA has assigned personnel to ensure that all condominiums are billed consistently.

3.3 Staff Reduction Program

Historically, PRASA's ratio of number of customers to staff has been low in comparison to industry standards. At the end of FY2011, PRASA had a total staff of 4,919 with 1,290,800 total accounts: 1,290,800 water accounts and 759,169 wastewater accounts; resulting in a ration of about 417 customer accounts per employee (up from 405 at end of FY2010, 360 at end of FY2009 and 340 at the end of FY2009). Current industry averages typically range from 390 to 780, with a median of approximately 550 customer accounts per employee[5]. Given the large number of PRASA facilities and wide geographic distribution of facilities, PRASA's comparatively low ratio of accounts to employees is not surprising; however, it is MPPR/Malcolm Pirnie's opinion that there are opportunities to improve PRASA's organization and make it more efficient.

PRASA's existing staff is categorized into five primary categories described below:

- Appointed Employees: This category includes: the executive staff, deputy directors, area directors and administrative assistants that provide support to key management personnel of the utility.
- Management Employees: These employees manage the day-to-day operations of the utility. They hold management positions both in the central and regional offices.
- HIEPAAA Employees (Hermandad Independiente de Empleados Profesionales de la Autoridad de Acueductos y Alcantarillados): These employees are the unionized professional staff that includes accountants, engineers, insurance specialists, project inspections, and surveyors.
- UIA-AAA Employees (Unión Independiente Auténtica de la Autoridad de Acueductos y Alcantarillados): These employees are mainly the unionized plant and system operators, maintenance and support staff, meter readers, customer service specialists, and administrative assistants.
- Temporary Employees: These employees are those that are hired and classified as temporary until formally assigned to a position. New hires are placed in a 90-day probationary period.

[5] Source: Benchmarking Performance Indicators for Water and Wastewater Utilities: 2007 Annual Survey Data and Analyses Report, American Water Works Association (2008). Note that a customer with water and sewer service is counted as two accounts for the purpose of this benchmark. Benchmarks reported for "all utilities" category.

They do not have full benefits during the probationary period. If still employed after probationary period, they either become full-time employees or remain temporary employees pending position confirmation.

Table 3-3 shows the staff levels by staff category over the last five fiscal years. Since FY2009, PRASA is utilizing methods for reductions of staff, such as an incentivized retirement program, re-training existing staff from overstaffed positions to reduce the need for new hires, and using staff attrition as a means to reduce staff levels. It should be noted that approximately 316 employees retired through PRASA's incentivized retirement program.

Table 3-3:
Staff Levels

End of FY	Appointed Employees	Management Employees	HIEPAAA Employees	UIA-AAA Employees	Temporary Employees	Total Employees
2007	156	940	190	4,046	509	5,841
2008	167	991	178	3,814	690	5,840
2009	165	1029	182	3,663	536	5,575
2010	161	960	171	3,391	318	5,001
2011	159	938	167	3,490	165	4,919

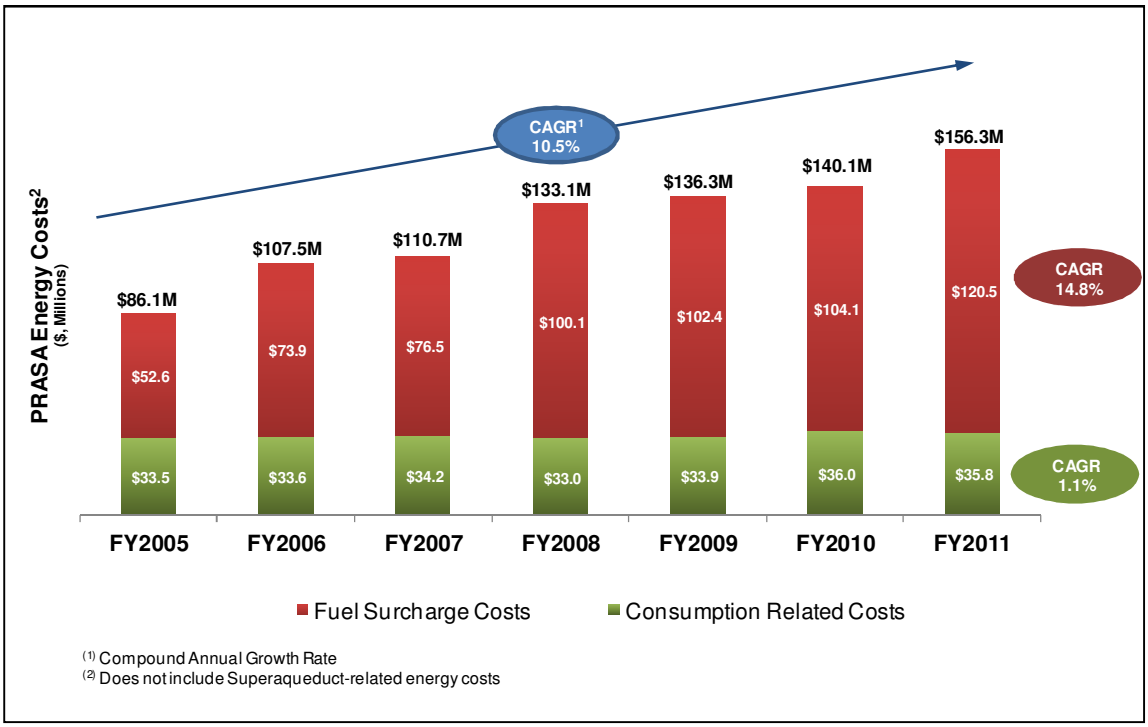
As shown above, PRASA has been consistently reducing its headcount through attrition. From FY2009 through FY2011 PRASA has had a net reduction of 922 employees. However, for FY2012 PRASA is reducing the cost of contracted services used to provide support on the Customer Services Department and will contract some employees to cover these tasks at a lower cost. The new temporary employees will have the right to the labor benefits as stipulated per law.

PRASA intended to continue its personnel reduction initiative in future years, as programmed. However, given the current economic situation and high unemployment rate of Puerto Rico, PRASA's administration determined that it was in the best interest of Puerto Rico's citizens and overall economy to delay its staff reduction plan to future years.

3.4 Comprehensive Energy Management Program

PRASA's energy costs have increased in the last seven fiscal years at an average rate of 10.5% per year as shown in Figure 3-2. PRASA's energy cost is the second largest cost behind payroll and makes up approximately 22% of its total operational costs. As shown in Figure 3-2, PRASA's consumption costs have stayed more or less steady over since FY2005. The increase in electricity costs is mainly due to increases of the Puerto Rico Electric Power Authority (PREPA) fuel surcharges and adjustments costs which are passed through to its customers. As also shown in the figure, fuel surcharge costs have continued to increase at an annual rate of approximately 14.8% per year.

Figure 3-2: PRASA Annual Energy Costs FY2005-FY2012



The average price per barrel of oil for the last six months of FY2011 (January 2011 to June 2011) was $107. This average was 40.7% higher than the average of the last six months of FY2010 (January 2010 to June 2010) which was $76. Due to this increase, PRASA's average monthly cost of electric power for the last six months of FY2011 was $13.0M, compared to $12.2M in the same period for FY2010. PRASA is projecting average monthly costs of electric power for FY2012 of $14.6M. The average prices per barrel of oil during the 1st, 2nd, 3rd and 4th quarters of 2011 were $74, $83, $100 and $114 per barrel, respectively[6]. FY2011 results demonstrate that PRASA's electric power budget metrics were not met; results were approximately $18M over budget.

PREPA continues to work in the implementation of the energy reduction strategies presented in the Puerto Rico Credit Conference in February 2010[7]. These strategies include the following:

- Reduce operating expenses
- Increase efficiency
- Minimize energy theft

[6] Source: http://www.eia.gov/dnav/pet/pet_pri_wco_k_w.htm
[7] "Puerto Rico Electric Power Authority – Company Overview and Project Development"

- Develop a proper fuel mix diversification
- Add renewable energy
- Maximize use of advance technology

Although the average price for a barrel of oil increased from FY2010 to FY2011, implementation of the above strategies are expected to contribute to the lowering of electricity costs. However, the timing of implementation and more importantly the impact of these strategies is uncertain at this time.

Additionally, in order to reduce these costs and reduce its dependency on PREPA, PRASA has undertaken two separate procurement processes to engage the private sector in investing in energy related projects, discussed below. These are:

1. Demand Side Projects through Energy Performance Contracts (EPCs)

2. Supply Side Projects through Power Purchase Agreements (PPAs)

However, results from the EPCs and PPAs efforts are not expected until FY2012, at the earliest. PRASA's financial projections, later discussed, do not include potential savings that would result from these initiatives.

Finally, PRASA and PREPA are currently in negotiations to transfer all hydroelectric facilities currently owned and operated by PREPA to PRASA. Once the transfer and transition phases are completed, this effort could represent significant additional net cost savings to PRASA. However, conservatively, PRASA has not included benefits from this effort in its financial projections.

3.4.1 Demand Side Projects through Energy Performance Contracts

PRASA has already conclude the procurement of the services and investments from private sector firms interested in entering into EPCs designed to reduce energy consumption at PRASA's facilities. The objective of this initiative is to have Energy Service Companies (also referred to as ESCOs) perform assessments and guarantee savings obtained by to installing equipment and implement activities designed to reduce energy consumption. There are two important benefits for PRASA in employing this type of performance contract. First, PRASA's operations benefit from improvements guaranteed by the ESCOs and as such it does not have to place additional burden to its CIP. Second, the EPCs are structured so that payments to ESCOs are only made by realizing measured and verifiable savings, placing most of the risk with the ESCOs (ESCOs guarantee savings to PRASA) and aligning the desired outcomes of both parties. The positive financial impact of this initiative for PRASA is limited by the fact that savings are guaranteed by the ESCOs until the investment is recovered and earned their agreed payments.

Through a Request for Qualifications (RFQ) process, PRASA selected 17 companies as eligible to submit EPC proposals. PRASA developed and issued four different RFPs to the selected companies for: buildings, plants, ancillary facilities (i.e., pump stations), and the North Coast Superaqueduct System. A total of 15 proposals were received and evaluated. The procurement process included a qualification phase, followed by a proposal phase. Also, it was divided into four main types of projects: buildings, plants, Superaqueduct system, and ancillary facilities (i.e., pump stations, wells, tanks). Seventeen (17) companies were qualified through the qualification process. Five of these companies presented proposals. The proposed projects vary in complexity, investment, and projected savings. So far, PRASA has proceeded with four projects, of which three have already commenced their Investment Grade Energy Audit (IGEA) phase (this is a requirement prior to entering into the final EPC). Expected annual savings (compared to current costs) are estimated at $5M. The table below provides a status summary of this initiative.

Table 3-4:
PRASA EPCs

Proponent	Facility Type	Number of Facilities to be Intervened	Status
Omega-Wendell	Buildings[1]	8	IGEA Completed In Contract Development
Omega-Wendell	Plants[2]	4	IGEA Completed In Contract Development
Honeywell	Plants[2]	6	IGEA Completed In Contract Development
Honeywell	Superaqueduct[3]	10	In Contract Development

[1] Includes Headquarters (central office), 6 operations offices, and 1 laboratory.
[2] Includes top four water and top six wastewater treatment plant facilities.
[3] Includes the water treatment plant and nine water distribution pump stations.

3.4.2 Supply Side Projects through Power Purchase Agreements

PRASA is also undertaking a parallel process in which it is procuring companies who are interested in providing independent energy supply services through PPAs. The objective is to secure one or more PPAs for lower energy unit costs per kilowatt-hour (kWh) than what PRASA currently pays to PREPA. PRASA developed and issued a Request for Proposals (RFP) for these services in August of 2009. PRASA received 19 proposals from interested parties in response to the RFP. The proposals that were received included different types of energy sources including: wind, solar, waste-to-energy, hydroelectric, and ocean-thermal technologies. After a thorough evaluation of the proposals, PRASA selected seven companies to pursue further negotiations to possibly enter into PPAs. However, thus far only three of the seven negotiations carried out by PRASA resulted in a successful agreement between the parties. The table below provides a status summary. Expected annual savings (compared to current costs) are estimated at $20M once all projects are implemented.

Table 3-5:
PRASA PPAs

Proponent	Technology	Status
Aspenall Energies	Wind	Contract Signed
Renewable Power Development	Waste-to-Energy	Contract Signed
Windmar Renewable Energy	Solar	Contract Signed

If successfully implemented, these supply side initiatives should be able to provide larger savings to PRASA than the demand side initiatives in the order of approximately $20M annually (after all are implemented). Additionally, there are other proposals still under evaluation (including non-solicited proposals received by PRASA), which may provide further benefits to this initiative. However, it must be noted that supply side projects, in general, take longer to complete than demand side projects. This is because permitting for and building new plants and facilities for the provision of alternate energy (e.g., wind or solar energy facilities) usually take significantly longer than replacing equipment in existing facilities. Another item that affects the implementation of certain projects that require the use of PREPA's grid is the wheeling regulation that will establish the real costs that PREPA will charge to the independent energy suppliers to use its grid.

3.4.3 Transfer of PREPA Hydroelectric Facilities

As of the date of this report, PRASA and PREPA intend to transfer the hydroelectric and irrigation system infrastructure currently owned and operated by PREPA to PRASA. The number of hydroelectric systems intended to be transferred is 10 with a total of 37 generating units. A total of three irrigation systems would also be transferred (please note that the actual number of facilities to be transferred may vary depending on the final transfer agreement signed between the parties). At this time, resolutions have been approved by both the PRASA[8] and PREPA[9] boards of directors, authorizing the agencies to move forward with this process. PRASA expects that the first phase of the transfer process will be completed by the end of FY2012; while the second phase should be completed in FY2013. PRASA is currently evaluating the possibility of operating these facilities through a Special Purpose Entity (SPE); Act 228 was approved on November 21, 2011 to allow PRASA to do so. Nonetheless, it is expected that PRASA will initially contract with PREPA to continue status quo operation to assure a smooth transition.

PRASA currently estimates annual net savings, after O&M expense, in the order of $30M[10]. This cost saving is based on an annual production of approximately 180 million kWh, which was the

[8] Board Resolution No. 2657
[9] Board Resolution No. 3861
[10] Savings do not include potential additional costs related to the dredging of certain water reservoirs, which may be required in order to increase water capacity and availability for the operation of the hydroelectric facilities.

same level of energy generation achieved by PREPA in FY2011. This estimate includes the associated operational and maintenance costs of the facilities as well as a wheeling cost of $0.02. According to the preliminary results of the *Hydroelectric System Evaluation Summary Report* prepared by the CSA Group for PRASA (dated December of 2011), there may be potential for significant additional savings if the generation capacity of these facilities is increased. In order to do so, PRASA would need to implement a capital and operational improvement and upgrade program that may amount to approximately $65M. Assuming that these improvements are implemented and that there is sufficient water available to operate the facilities for a significant portion of the time (no additional information on water availability and estimated operating schedules for the hydroelectric facilities is available at this time), PRASA has preliminarily estimated that production could potentially be increased to 380 million kWh (43 MW) which, in turn, could generate considerable additional electricity cost savings to PRASA in the future. MPPR/Malcolm Pirnie has not validated PRASA's additional generation estimations, nor has it validated CSA Group's report.

3.5 Integrated Preventive Maintenance Program (IPMP) Progress

The 2006 and 2010 Consent Decrees with EPA and the 2006 Transactional Agreement with PRDOH require that PRASA implement and continue to develop a comprehensive integrated preventive maintenance program, the IPMP, to ensure the proper operation and maintenance of its plants and other critical facilities, including WWPSs. Through the IPMP, PRASA is establishing a plan to enable programmed and continuous maintenance to plants, pump stations, vehicles, and equipment to provide for more reliable service, improve client satisfaction, and achieve long-term operational cost savings through preservation of assets. PRASA currently finances part of the IPMP through its CIP (costs associated with the necessary R&R prior to the integration of the facilities into the IPMP) and the rest (the actual maintenance costs) through its O&M budget.

To date, PRASA has expended over $100M in the development and implementation of the IPMP. Additionally, PRASA plans to spend an additional $23M of R&R in fiscal years 2012 and 2013 to complete the development and implementation of the program, ahead of the schedule required by Regulatory Agencies. In FY2014 and beyond, all the operating costs associated to the preventive maintenance will continue to be included in PRASA's annual O&M budget as a regular operational expense.

Some of the benefits highlighted by PRASA regarding the IPMP include the following:

- Creation of PRASA's first centralized inventory of assets (equipment and instruments), which includes historical information regarding maintenance.

- Implementation of a robust maintenance program that integrates and centralizes procedures, systems, documentation, metrics, and technical and cost information of PRASA's fixed assets.
- Improved planning and management of fixed assets maintenance.
- Compliance with regulatory agency consent decrees and agreements.

Because the IPMP is a dynamic and flexible program, it has allowed PRASA to make adjustments throughout the development and implementation of the program in order to optimize it and further reduce costs associated with its implementation. To date, PRASA reports that there are 1,096 facilities in the IPMP. PRASA projects that by FY2013 all WTPs, WWTPs, WWPS, and Dams, and select water ancillary facilities will be included in the IPMP. Approximately 3,332 facilities are projected to be included in the IPMP by FY2013. Furthermore, PRASA has coordinated the IPMP implementation with the Treatment Plant Automation Program (discussed in the following section), in order to better align and optimize its program implementation efforts for both initiatives.

3.6 Treatment Plant Automation Program

PRASA has continued the development and implementation of the Treatment Plant Automation Program, which consists in the installation of the necessary equipment and the development of the O&M and system protocols to automatically and remotely operate its WTPs. The project scope includes the procurement and installation of automation control equipment (capital investment is estimated at approximately $400,000 per facility). A total of 121 WTPs will be integrated in under the program (the remaining five facilities are either scheduled for closure in the next few years or it is not feasible/cost effective to automate). In turn, these 121 WTPs will be organized in clusters (a total of 24) that will be operated and monitored from a Regional Operational Center.

At the end of FY2011, the status of the program is the following:

- All designs for facilities to be automated have been completed.
- Construction of 12 WTPs has been completed.
- 59 WTPs are currently in the construction phase.
- 18 WTPs are pending notice to proceeds for construction.
- Construction works for 30 WTPs will be bidded out in FY2013.
- PRASA's Treatment Plant Automation Program consultant is working closely with PRASA's human resources department for the development of the training plan for operators, supervisors, and managers, and in the development of the necessary policies for the development of clusters.

- PRASA and its consultant continue to coordinate with PRDOH, who is yet to provide an approval of the proposed modified plant cluster structure.

Due to PRASA's fiscal situation, the implementation phase program was delayed. Hence, during FY2012, PRASA plans to complete the automation of 36 WTPs (down from 60 originally planned) and the creation of seven clusters. The full program implementation is expected to be completed in FY2014. As such, PRASA plans to complete the automation of 53 facilities (ten clusters) and 32 facilities (seven clusters) during FY2013 and FY2014, respectively. Once all facilities are automated and the clusters are formed, PRASA estimates that the annual cost savings could be as much as $21M. However, since the majority of the savings projected to be obtained through this initiative are payroll-related, the achievement of these projected benefits assumes that the necessary staff reductions will take place. Given the current uncertainty regarding future staff reductions, PRASA has not included these potential savings in its financial projections.

3.7 Select Initiatives from the Postponed Public-Private Partnership (PPP) Project

As a result of an evaluation of PRASA's commercial services, it was found that there is significant room for improvement regarding the performance of the customer services. In turn, this situation is negatively affecting PRASA's finances as a significant amount of revenue is unbilled and uncollected.

Subsequently, a research study was conducted to determine the feasibility of PRASA entering into Public-Private Partnerships (PPP) with one or more contractors to improve its meter reading infrastructure and commercial practices and services as a whole. As part of this assessment, PRASA's consultant researched what other utilities have done around the world as it relates to engaging the private sector in this operational scope. The main findings highlight that multiple utilities around the world have retained the services of private firms to help them reduce its volume of NRW and provide more effective commercial services.

As such, in 2010 PRASA submitted a proposed PPP project to the PPP Authority[11] for consideration and inclusion in its project inventory. PRASA's proposed project was selected by the PPP Authority as a potential project for a PPP and was included in the PPP Authority's inventory of projects. The Desirability and Convenience Study, a requirement of the PPP Authority process, was completed in May of 2010. Upon receipt and acceptance by the PPP Authority, the Board of Directors approved the publication of the RFQ to begin the procurement process.

[11] The *Public-Private Partnership Act* (the Act) was approved on June 8, 2009. The Act created the PPP Authority as a public corporation of the Commonwealth affiliated to the Government Development Bank for Puerto Rico. Additional information related to Puerto Rico's PPP Program can be found on the PPP Authority's website http://www.p3.gov.pr.

The RFQ was published on June 15, 2010. The qualifications process was completed on August 15, 2010 when 13 companies, or teams of companies, submitted Statements of Qualification (SOQs) for the project. Of these, seven were shortlisted to continue in the procurement process.

The RFP and draft Service Contract were completed in August of 2010. However, these documents underwent extensive and numerous revisions from August of 2010 through February of 2011. As a result of its ongoing collective bargaining negotiations with the UIA-AAA and changes to the Central Government's public policy, PRASA modified the structure and scope of work of the Project.

In February of 2011 the PPP Authority BOD requested that the PPP Authority in collaboration with PRASA conduct market sounding meetings with Shortlisted Proponents. The purpose of these meetings was to gauge Shortlisted Proponents' interest in the re-defined Project and in continuing the procurement process under the revised Project approach. All seven Shortlisted Proponents confirmed their attendance and participated in a group presentation. After the presentation, individual meetings were held with each Shortlisted Proponent team to obtain their feedback and concerns regarding the proposed scope. The feedback obtained from most teams was similar and could be summarized as follows:

- Original scope was more attractive to Proponents, allocated risk better between the parties, and was better suited to meet the Project objectives and obtain PRASA's desired results.
- Extend the service contract time (some teams mentioned five year minimums).
- Reduce the time in the financing terms to match the time for the service contract.
- Consider including commercial operation activities.
- Include some form of performance-based incentives and penalties.
- Project scope seemed too aggressive for the two-year period proposed.
- Concerns about the likelihood of achieving significant reductions in NRW with the current approach.
- Concerns regarding payment guarantees.

After evaluating the questions, comments, and concerns presented by the Shortlisted Proponents, and obtaining additional feedback from legal counsel, the PPP Authority and PRASA determined it was not in their best interest to continue to pursue the Project as re-defined. On March 18, 2011, the PPP Authority Director, PRASA's Executive President and its Executive Director for Infrastructure, presented a summary of the feedback received from Shortlisted Proponents during the market sounding meetings and gave their recommendation to cancel the procurement process to the PPP Authority BOD. The PPP Authority BOD agreed with this recommendation and, as such, the procurement process was cancelled and the project implementation was postponed. Shortlisted Proponents were informed.

Notwithstanding the above, PRASA has embarked on the development of a strategic NRW management and reduction plan. For this, in late 2011, PRASA retained the services of Miya Puerto Rico LLC (Miya) a local subsidiary of Miya Luxemburg Holdings S.a.r.l., a world-renowned NRW consultant. The objective of this strategic NRW management and reduction plan is to provide PRASA with the necessary information to embark on a comprehensive and cost-effective long-term NRW management program. The scope of work for this effort includes:

- Rapid NRW assessment including preparation of a water balance and calculation of water loss PIs
- Development of a comprehensive NRW management strategy
- Preparation of initial cost estimates
- Preparation of rough NRW level forecasts
- Revision of PRASA's organizational structure and recommendation of changes necessary for successful NRW management
- Determination of required staffing of the future NRW team
- Preparation of an initial cost/benefit analysis

Miya is also expected to provide benchmark comparisons with other jurisdictions (world-wide) as well as the necessary guidance for the implementation of the plan, considering their experiences with what has worked, and what has not, in other jurisdictions comparable to Puerto Rico. The implementation of this program is still in its very initial stages and MPPR/Malcolm Pirnie intends to follow up on the progress of this initiative and provide an update of such progress in future Consulting Engineer's reports.

Additionally, PRASA is currently in the procurement process for the implementation of two operational initiatives that had been originally included under the PPP Project. These are:

1. Development of a Customer Geodatabase (Cadaster)

2. Development and Installation of Automated Meter Reading Technology for Large Meter Customers in the Metro Region

PRASA is projecting additional revenues from these two initiatives in the order of $1M and $2M for FY2015 and FY2016, respectively. A brief description of these two select initiatives is presented below.

3.7.1 Development of a Customer Geodatabase

This project consists in the development of an island-wide customer geodatabase to identify and map (geospatially) PRASA's existing and potential customers including, but not limited to, developed and pre-developed parcels not included in PRASA's SAP customer database. This Geodatabase shall then be linked with PRASA's SAP customer database.

PRASA seeks to develop a tool for the proactive management of its customer database, that will help in the detection of theft and, ultimately, in the reduction of apparent (commercial) losses. As such, the Project objectives focus on:

- the Reduction of NRW losses
- the identification of PRASA's customers and non-registered users geospatially
- the improvement of water system planning (uses and needs) and water conservation

Procured services include the following:

- Integration of PRASA's current customer database with the existing databases of other Puerto Rico agencies to identify common customers and use as the starting point for the Geodatabase to be created as part of this Project.
- Field investigations to collect and validate customer data for those customers not identified through the integration of the databases.
- Development of the Geodatabase using Geographic Information System ("GIS") software.
- Maintaining and updating the Geodatabase throughout the Contract Term.
- Preparation of protocols for creating and updating the Geodatabase; and for updating PRASA's SAP System ("SAP") customer database.
- Linking the Geodatabase with PRASA's SAP customer database.
- Standardizing customers' physical and postal addresses in both the Geodatabase and PRASA's SAP customer database.
- Preparation of Operation and Maintenance ("O&M") documents for the Geodatabase.
- Training PRASA employees in the O&M, updating, and troubleshooting of the Geodatabase.

PRASA has completed the procurement process for this project and is currently in the contract development phase. Project development and implementation is projected to commence in FY2013. The implementation time is estimated at 12 months.

3.7.2 Development and installation of an AMR/AMI System for Large Meter Customer in the Metro Region

This project consists in the installation and operation of an Automatic Meter Reading and/or Advanced Metering Infrastructure (AMR/AMI) system for approximately 3,400 large meter customers in the Metro Region. The project objectives include:

- Increasing efficiency and accuracy of the meter reading and billing process: PRASA seeks to reduce the time it takes to read meters and thus, increase the frequency of meter reads while reducing the number of estimated bills. PRASA also seeks to reduce the errors in customer bills associated with manual meter reads.
- Improving customer service: PRASA seeks to improve customer service by reducing estimated and erroneous bills, and allowing customers to access their consumption data over the Internet.

Services to be procured include, but are not limited to:

- Supply and installation of an AMR/AMI system.
- Integration of the AMR/AMI system with PRASA's customer information system (SAP)
- Provision of an interactive web application for customers to access their consumption data over the Internet.
- Operation and maintenance of the system, including reading and maintaining the meters and associated equipment.

Procurement for this initiative should be completed in FY2012, and implementation is projected to commence in FY2013. The implementation time for this initiative is estimated at 18 months.

3.8 Conclusions

PRASA's O&M practices are adequate. One recurring finding in the facility inspections is the need for facility-specific O&M plans or manuals for treatment plants. Also, there is an identified need of standardized process for prioritizing, scheduling, and executing preventive, corrective and routine maintenance activities.

Currently, PRASA's operational and cost metrics are generally unfavorable compared to the median values for utilities in the U.S., which is not a surprising result considering the size and complexity of the System; PRASA's high staffing levels, which translate into high payroll and benefits costs; and high electricity costs.

PRASA's staff has been significantly reduced in recent years and this has affected PRASA's meter reading performance metrics and effectiveness in addressing leaks and overflows. PRASA could benefit from a utility-wide organizational assessment to better identify areas with staffing needs and surpluses, respectively.

Finally, benchmark comparisons show that PRASA has areas that could be improved and that represent large opportunities with regards to the reduction of its NRW and increasing its billings and collections. PRASA continues to develop and implement operational initiatives with the goal of improving and optimizing its operations. The operational initiatives currently being implemented are generally aligned with PRASA's needs and represent potential additional cost savings or revenue enhancements that could positively impact PRASA's financial situation.

4 Capital Improvement Program and Regulatory Compliance Status

4.1 Introduction

PRASA continues to implement an aggressive CIP to improve its water and wastewater infrastructure. The purpose of the CIP is to modernize PRASA's infrastructure, protect public health, safeguard environmental quality, permit continued economic development and help bring PRASA's infrastructure into compliance with all regulatory requirements.

The CIP is a dynamic program that is constantly evolving and undergoing revision as needs and funding are identified, and as projects transition from planning through design, construction and startup. PRASA's five-year CIP has a comprehensive listing of projects and budgets through June 30, 2016. A total of 647 projects are scheduled for implementation during this period. As required by PRASA's Board, PRASA's Infrastructure Department must annually submit for it approval an updated five-year CIP plan. Given the magnitude of the CIP, it is understandable that it will continue to evolve over time and the number and budgets of projects is expected to be updated regularly. As of November 30, 2011, PRASA's CIP for fiscal years 2012 through 2016 includes $1,558.7M in capital expenditures over fiscal years 2012 through 2016. In FY2011, PRASA's capital expenditures amounted to $338.5M.

The CIP projects are divided into categories, groups and types. In addition, PRASA has implemented a prioritization system in order to better manage the CIP, given its size and complexity. The individual project cost estimates within the CIP, including the R&R program, have not been independently verified. This section of the report provides:

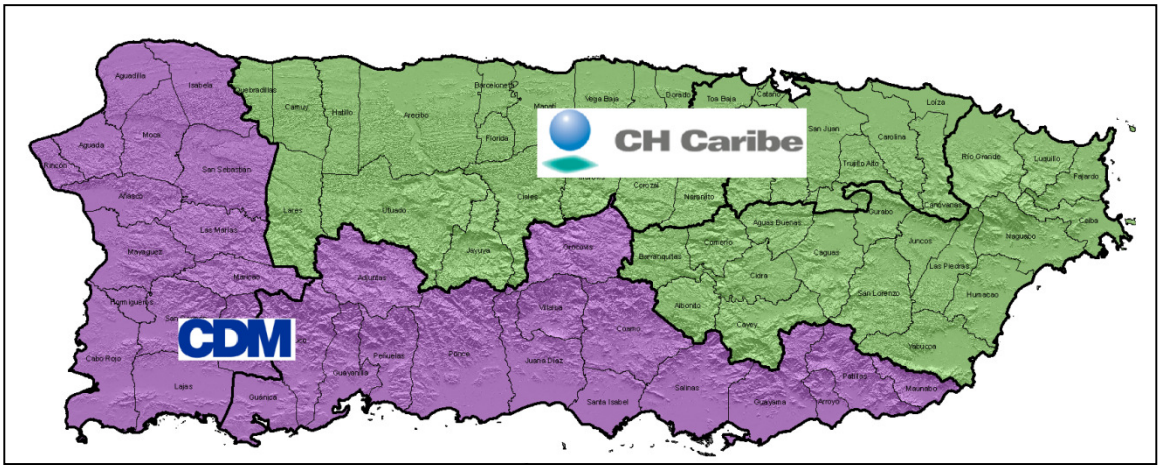
- an overview of PRASA's CIP (approved by PRASA's Board on September 2011), including summary of the program by project category,
- an assessment of the adequacy of the CIP to address identified system deficiencies and current requirements stipulated in open consent decrees with regulatory agencies, and
- an overview of the potential effects of future regulations on PRASA's System and CIP.

4.2 CIP Development and Management

PRASA continues to engage world renowned engineering and consulting companies (Program Management Consultants, or PMCs) in the development, implementation, and evolution of the CIP. PMCs provide support to PRASA in the project development process and actively participate in the planning, design and construction phases. They also manage key tasks that drive CIP project budgets, such as defining project scopes, negotiating consultant contracts for studies and design services, and preparation of project construction cost estimates. As a result of

PRASA's CIP implementation plan and the economic situation currently affecting Puerto Rico, the number of CIP projects being implemented has been reduced over recent years. Therefore, effective July 1, 2009, PRASA reduced the number of Program Management Consultants (PMCs) from five to two, as shown in Figure 4-1 below.

Figure 4-1: Current Program Management Consultants and their Respective Regions



As a result, the associated program overhead costs yielded cost savings to PRASA of approximately $7M. PRASA continues to work with the other three firms not selected to continue as PMCs (CSA Group, CPM-MPPR, and Black & Veatch of Puerto Rico) in areas such as planning, design, land acquisition and other special assignments.

4.3 CIP: Project Distribution and Costs

There are 647 projects currently included in the FY2012–FY2026 CIP. Projects included in the CIP cover major capital improvements identified throughout all five Regions, as well as island-wide initiatives such as technological advancements, telemetry implementations, R&R component of the IPMP, meter replacement, and R&R to the System.

The CIP is developed by PRASA taking into consideration a) current and future infrastructure and operational needs identified from system planning studies, and b) regulatory commitments as stipulated in consent decrees, administrative orders, and other agreements with regulatory agencies. Once the need for a capital improvement project is identified, a project creation form is prepared. The form summarizes the project scope, preliminary schedule, and cost estimates, amongst other information. The project is then assigned a CIP project number and added to the CIP inventory, where it is categorized according to PRASA's classification and prioritization system. Periodically, the changes to the CIP are presented to PRASA's Board for their revision and approval.

Total CIP investments per project are calculated taking into consideration the following estimated costs:

- Planning, Studies, and Land Acquisition Costs
- Design Costs
- Construction Costs
- Project Management and Inspection Costs
- Contingencies
- Miscellaneous Cost (includes financing costs, insurance, O&M documents and administrative costs)

The project management and inspection costs are estimated to be 7.5% of the construction cost. Contingencies are estimated to be 10% of the construction cost. Project costs are inflated, on a compound basis, by 3.8% until the construction notice to proceed is executed. These percentages are considered reasonable, since they are based on historic data of completed projects. Also, throughout the development of the planning and design phases of the project, the contingencies are modified as the construction cost estimates are updated. Once the project goes out to bid and the bid is awarded, the amount calculated for contingencies is no longer updated and it remains as part of the assigned funds of the project until it is completed and closed-out. During the construction phase of the projects, contingencies are used to cover change order costs and other costs that may occur, such as additional land acquisition, permitting, or design activities.

Since 2006, PRASA's metrics regarding completion of construction projects in a timely fashion and within budget have improved. Through FY2011, PRASA reports that its rate of change order costs to total construction costs is approximately 5%; this represents a decrease of 6% when compared to the results prior to 2006 (first year of PRASA's CIP with PMCs). Similarly, in terms of construction delays (increases in time to complete project), the percentage through FY2011 is now 33%, which represents a decrease of 91% when compared to the results prior to 2006.

4.3.1 Project Classification and Prioritization

CIP projects are classified into mandatory or non-mandatory categories. Mandatory projects are those that are required by law, as stipulated in consent decrees, administrative orders, and agreements with regulatory agencies including the USEPA and PRDOH. There are five CIP categories, listed below in order of importance:

- Mandatory (USEPA, PRDOH, Civil Action, Administrative Orders)
- Non-Mandatory Compliance (Health and Safety)
- Non-Mandatory Quality, Efficiency, Reliability and Redundancy
- Non-Mandatory Growth
- Non-Mandatory Other

Projects are further classified as either water or wastewater system projects. Water System projects include projects for improvements or construction of new facilities regarding: water supply, water distribution, WTPs, water pump stations, amongst others. Wastewater System projects include projects for improvements or construction of new facilities regarding: wastewater collection, WWTP, wastewater pump stations, amongst others.

Other types of projects that are included in the CIP are:

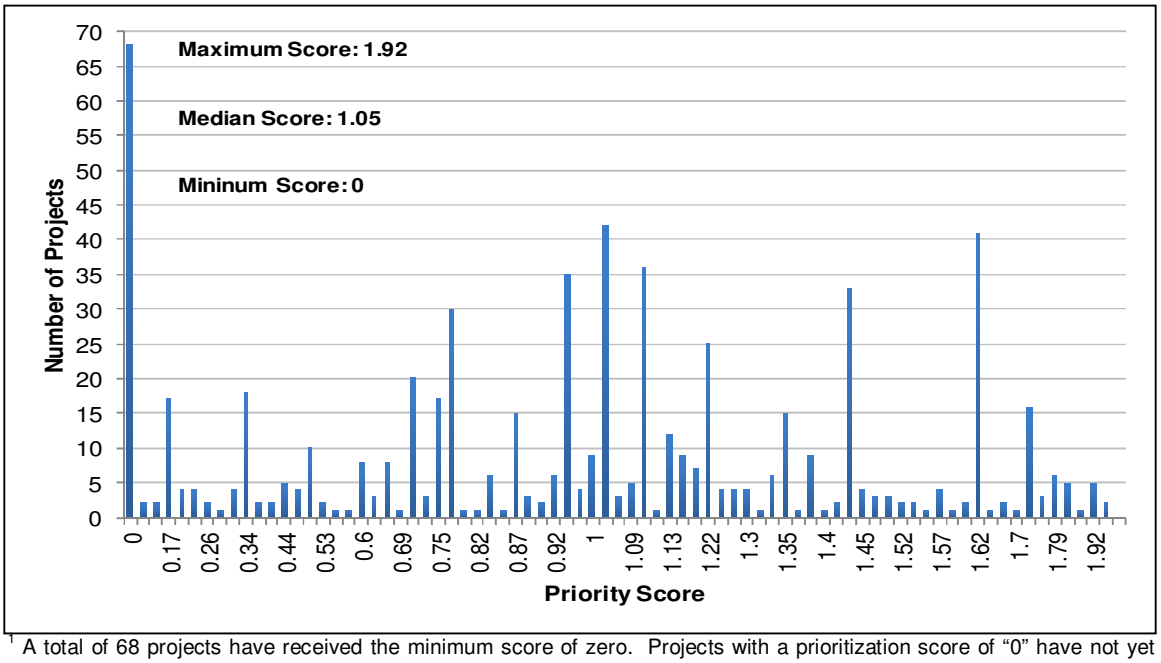
- R&R component of the IPMP (includes water and wastewater project types)
- Renewal and Replacement (includes water and wastewater project types)
- Technology (includes information technology project types)
- Meters
- Buildings
- Fleet

In addition to project classification, CIP projects are ranked according to a prioritization score. This score is the result of the weighted sum of the evaluation criteria adopted in PRASA's Master Plan. Categorizing and prioritizing projects gives PRASA the ability to maintain an organized and dynamic CIP. The criteria and associated weight of importance by which each project is evaluated are:

- Environmental Compliance (35% weight) – Satisfying local and federal environmental regulations, discharge limits, watershed protection, and sludge treatment and handling.
- Quality of Service (22% weight) – Service quality improvements, improvements to existing service areas, service continuity, WTP capacity expansion to meet demand, and treated water storage.
- Operational Efficiency (17% weight) – Reduction of operational costs and physical losses, plant improvements, and instrumentation.
- Reliability and Redundancy (13% weight) – Distribution redundancy to handle peak demand, emergencies and other transient events, raw water storage, transmission redundancy, electrical power redundancy, and intake improvements.
- System Growth (9% weight) – Wastewater service extension, WWTP expansions in to accommodate service extension, and inclusion of Non-PRASA water systems.
- PRASA Management Privilege (4% weight) – Used by PRASA's management to increase priority of a project and break ties, when necessary.

The maximum score a project can receive is two (High Priority), and the minimum is zero (Low Priority). As shown on Figure 4-2, most projects fall between the medium to high priority ranges.

Figure 4-2: Project Distribution by Prioritization Score[1]



[1] A total of 68 projects have received the minimum score of zero. Projects with a prioritization score of "0" have not yet been classified by PRASA; the CIP table automatically assigns a "0" wherever no score has been assigned. None of the projects that have a "0" score are of highest priority to PRASA.

4.3.2 CIP Programming: FY2012-2016

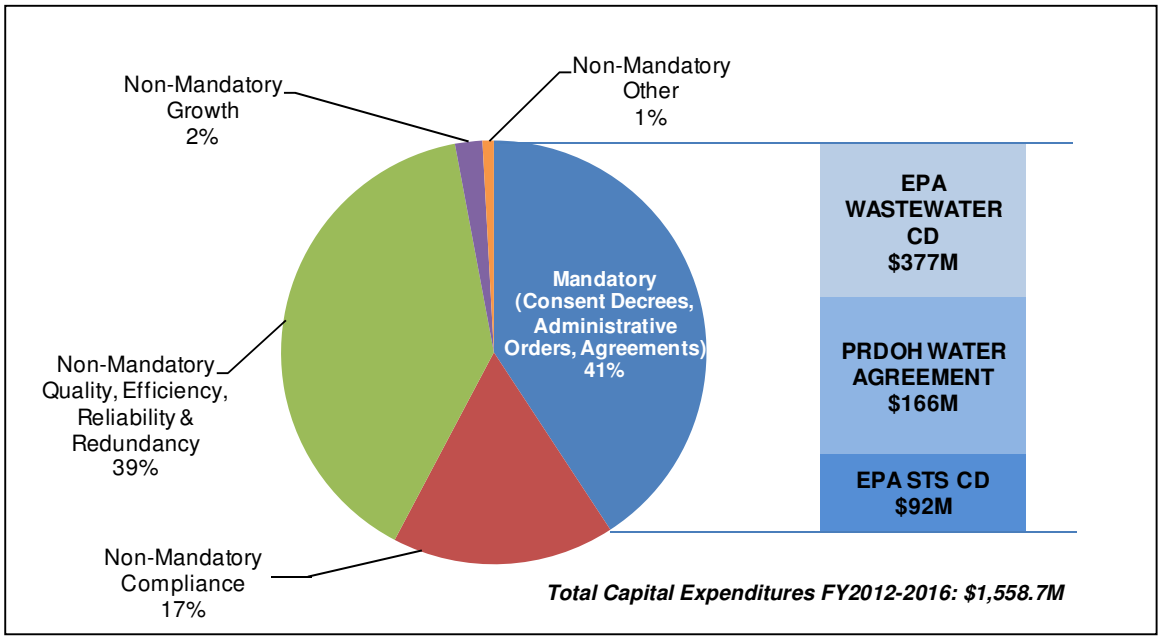
The CIP budget for FY2012 through FY2016 is $1,558.7M and includes $634.7M for mandatory projects, as shown in Table 4-1. Figure 4-3 shows the total capital expenditures by category for FY2012 through FY2016.

Table 4-1:
Capital Improvement Program FY2012-2026 by Category ($, Millions)

Project Category	Fiscal Year Ending June 30,					Total[1]
	2012	2013	2014	2015	2016	2012-2016
Mandatory (Consent Decrees, Agreements etc.)	$140.0	$158.8	$137.4	$93.6	$104.9	$634.7
Non-Mandatory Compliance	73.6	73.0	47.1	31.2	40.6	265.5
Non-Mandatory Quality, Efficiency, Reliability & Redundancy	169.2	153.4	111.7	85.2	93.0	612.5
Non-Mandatory Growth	14.8	6.6	3.6	4.2	3.3	32.5
Non-Mandatory Other	9.1	4.1	0.3	-	-	13.5
TOTAL	**$406.7**	**$395.9**	**$300.1**	**$214.2**	**$241.8**	**$1,558.7**

[1] Numbers may not add due to rounding.

Figure 4-3: FY2012-FY2016 Capital Expenditures by Project Category



Water System Projects

The water system projects include projects to improve compliance (mandated and not mandated), new WTPs, new reservoirs and upgrades to water distribution systems. Total capital expenditures in water system projects for FY2012–FY2016 are estimated at approximately $544M, of which approximately $319M is allocated for projects classified as mandatory. Figure 4-4 shows the FY2012–FY2016 CIP expenditures for water system projects.

Wastewater System Projects

The wastewater system projects include projects to improve compliance, new WWTPs, and upgrades to wastewater collection systems. Total capital expenditures in wastewater system projects for FY2012–FY2016 are estimated at $473M, of which approximately $292M is allocated for projects classified as mandatory.

Other Projects: Operational, Planning, R&R and Technology

Total capital expenditures for all other capital projects are estimated at approximately $541M for FY2012–FY2016. These projects address R&R, preventive maintenance, meter replacements, office and building improvements, fleet upgrades, additional studies and system renovation, and technology improvements. R&R component of the IPMP and certain R&R projects are categorized as mandatory-driven, with an estimated FY2012–FY2016 capital expenditure of $24M.

Table 4-2 shows the project distribution and capital expenditure by group and type classification for FY2012 through FY2016.

Table 4-2:
Capital Improvement Program 2011-2016 by Project Type ($, Millions)[1]

Category Type	Sub-Category	Fiscal Year Ending on June 30,					Total[1]
		2012	2013	2014	2015	2016	2012-2016
Water System	Water Supply	$16.5	$23.9	$28.9	$17.6	$14.6	$101.5
	Water Pump Stations	5.8	3.1	0.2	-	-	9.1
	WTP Capacity Increase	0.8	2.9	5.7	6.7	1.0	17.1
	WTP Improvements	57.6	68.9	38.2	12.0	10.8	187.5
	WTP New	21.6	19.4	24.8	13.5	7.9	87.2
	Water Distribution	77.8	39.9	18.3	4.5	1.4	141.9
	SUBTOTAL	**$180.1**	**$158.1**	**$116.1**	**$54.3**	**$35.7**	**$544.3**
Wastewater System	Wastewater Pump Stations	$8.9	$9.7	$1.6	$0.1	$ -	$20.3
	WWTP Capacity Increase	8.6	14.9	27.2	46.0	65.2	161.9
	WWTP Improvements	15.5	12.3	9.5	5.0	8.0	50.3
	WWTP New	7.3	2.8	-	-	3.3	13.4
	Wastewater Collection	64.2	68.0	47.0	21.8	26.5	227.5
	SUBTOTAL	**$104.5**	**$107.7**	**$85.3**	**$72.9**	**$103.0**	**$473.4**
Meters	Water Meters	$36.0	$24.2	$16.8	$18.3	$22.9	$118.2
Buildings	Buildings	5.3	3.3	0.8	-	-	9.4
Fleet	Fleet	2.5	2.7	2.9	3.0	5.5	16.6
IPMP (R&R component only)[2]	Water & Wastewater	16.2	7.1	-	-	-	23.3
R&R Structure	Water & Wastewater	22.0	38.4	51.4	53.8	57.6	223.2
Technology	Water & Wastewater	40.1	54.3	23.5	2.3	4.7	124.9
Other (Studies, renovation, etc.)	Water & Wastewater	-	-	3.4	9.6	12.4	25.4
	SUBTOTAL	**$122.1**	**$130.0**	**$98.8**	**$87.0**	**$103.1**	**$541.0**
TOTAL[1]		**$406.7**	**$395.8**	**$300.2**	**$214.2**	**$241.8**	**$1,558.7**

[1] Numbers may not add due to rounding.

[2]Does not include actual maintenance costs related to the IPMP; these are included in PRASA's O&M budget.

4.4 Current Regulatory Compliance and the CIP

PRASA is currently bound by the terms of several comprehensive consent decrees and settlement agreements to eliminate treatment plant non-compliance and unpermitted discharges of untreated sewage, and to improve the quality of potable water and sludge treatment systems. These agreements include the following:

1. PRASA IV: 2003 Consent Decree, United States v. PRASA, Commonwealth of Puerto Rico, and Compañía de Aguas de Puerto Rico, Inc., Civil Action No. 01-1709 (JAF) – Addresses violations to the Section 301 and 402 of the Clean Water Act (CWA) and regulations and PRASA's NPDES permits with regard to certain of PRASA's wastewater pump stations
2. 2006 Wastewater Consent Decree, United States v. PRASA and Commonwealth of Puerto Rico, Civil Action No. 06-1624 (SEC) – Addresses violations to the Section 301 and 402 of the CWA and regulations promulgated there under, and PRASA's NPDES permits with regard to PRASA's WWTPs.
3. Puerto Rico Department of Health 2006 Drinking Water Settlement Agreement Civil Action KPE 2006-0858[12]– Addresses non-compliance and alleged violations with the Puerto Rico Potable Water Purity Protection Law, as amended ("Ley para Proteger la Pureza de las Aguas Potables de Puerto Rico, Ley Num 5 de 21 de Julio de 1977, según enmendada"), the SDWA and applicable regulations, and the General Environmental Health Regulation ("Reglamento General de Salud Ambiental, Reglamento Núm. 6090 de 4 de febrero de 2000").
4. 2010 USEPA STS Consent Decree, United States v. PRASA and Commonwealth of Puerto Rico – Addresses alleged violations to the Safe Drinking Water Act (SDWA) and the CWA specifically to the National Primary Drinking Water Regulations (NPDWRs).

These consent decrees with USEPA and the agreement with PRDOH require PRASA to implement remedial plans, and develop and implement CIP projects to bring the System into compliance with regulatory requirements. PRASA currently estimates that the total cost (incurred and projected) of compliance with the various decrees will be approximately $2.7 billion through fiscal year 2025.

PRASA's five-year CIP, previously described was compared with existing (active) consent decrees and agreements that PRASA has entered into with regulating agencies in order to determine the adequacy of the identified projects in the CIP with regulatory requirements. MPPR/Malcolm Pirnie has found that the CIP is structured to modernize and help bring the systems into compliance with applicable environmental laws, and adequately addresses the

[12] In 2008 CER and PRASA's Official Statement, it was referred to as 2006 Drinking Water Settlement Agreement. Year has been updated to reflect date Settlement Agreement was signed: March 15, 2007. Subsequently, the Settlement Agreement was amended on June 16, 2008.

requirements of these consent decrees and agreements. Nonetheless, it shall be noted that the actual cost of compliance with the consent decrees and agreements and PRASA's total capital expenditures may vary substantially depending on, among other things:

- inflationary environment with respect to the costs of labor and supplies needed to implement the compliance program
- weather conditions that could adversely affect construction schedules and consumption patterns
- population trends and political and economic developments in Puerto Rico that could adversely impact the collection of operating revenues
- willingness of the U.S. Justice Department, USEPA, PRDOH and others, to cooperate with respect to the timing of implementation and any additional requirements that may arise as PRASA implements its mandated studies and remedial plans
- possibility of new environmental legislation or regulations affecting the Systems
- unanticipated costs or potential modifications to projects resulting from requirements and limitations imposed by environmental laws and regulations
- inherent uncertainty involved in CIP projects of the magnitude undertaken by PRASA

4.5 Future Regulations and Other Regulatory Requirements

The CIP was reviewed for adequacy to comply with future regulations and regulatory other regulatory requirements that could impact compliance limits for PRASA's water and wastewater facilities.

Regarding the wastewater system, although plant-specific changes to effluent permit limits may change from time to time, due to site-specific issues, there are no identified future regulations anticipated to require additional capital improvements to the WWTPs beyond those future effluent limits identified in the consent decrees. However, PRASA may be required to implement a repair plan of its wastewater collection system (including any existing combined sewer systems) to eliminate sewer overflows. At this time, the economic impact of developing and implementing repair plans in these systems is uncertain. As such, PRASA is presently unable to determine the total cost of the CIP projects to be required to bring the wastewater collection systems into regulatory compliance and, as such, has not included these in its CIP.

Regarding the water system, anticipated future regulations for potable water systems (PWSs) at the time of this report writing include:

- Stage 2 Disinfectants and Disinfection Byproducts Rule (Stage 2 DBPR).
- Long Term 2 Enhanced Surface Water Treatment Rule (LT2 ESWTR).

- Groundwater Rule (GWR).
- Future contaminants of concern based on current scientific knowledge.

Likely concerns for PRASA pertaining to each regulation are discussed in the following subsections.

PRASA has included some capital investments in its FY2012-2016 CIP in preparation of the following future regulations. However, additional capital improvements may be required. At this time it is not possible for PRASA to determine the magnitude of such expenditures, but it is possible that these may be significant. Also, PRASA and the Regulatory Agencies are currently in discussions to potentially modify certain requirements of the existing consent decrees and agreements. These modifications could result in the delay or advancement of the implementation of certain projects currently included in the CIP, and/or the modification of their scope of work. At this time it is not possible for PRASA to determine the results of these discussions and the effects these may have on its CIP; nonetheless PRASA expects that these discussions will be beneficial for PRASA from a financial standpoint.

4.5.1 Likely Effects of Stage 2 DBPR on PRASA

Compliance data from records provided by PRASA for 2006 show that 34.1% of PWSs have disinfection byproducts (DBPs) greater than the 64 parts per billion (ppb) for total trihalomethane (TTHMs) or 48 ppb for HAAs. While the maximum contaminant levels (MCLs) for TTHMs and HAAs are 80 ppb and 60 ppb respectively, 64 ppb and 48 ppb were used because they represent 80% of the MCL. As a general rule of thumb, if a PWS is within 80% of the MCL for DBPs, it is in danger of violating Stage 1 DBPR and should be considered as a likely violator of Stage 2 DBPR. This data suggests that 34% of the PWSs are likely to be affected by Stage 2 DBPR. The following are the likely effects of the Stage 2 DBPR on some PRASA drinking water systems:

- Changes in the management of the distribution system to minimize residence times hence reduce the formation of DBPs.
- Movement of the point(s) of chlorine addition without compromising overall disinfection efficacy (additional disinfectants may be needed)
- Optimizing organics removal through the treatment process – through additional treatment or enhanced coagulation/softening measures
- Use of alternative disinfectants

It is important to note that these measures have varying degrees of costs. Some measures are not capital intensive, and the costs are mainly associated with administrative and operational changes, while others, such as new solids removal systems for sedimentation basins or expanded solids treatment systems for greater quantities of coagulants (to reduce organics), will require capital expenditures.

4.5.2 Likely Effects of LT2 ESWTR on PRASA

Based on the FY2010 CER facility inspections results, 15% of WTPs (a total of 19 out of 127) have experienced turbidity violations from January to December 2009. In comparison to the 2009 CER, a decrease in this percent from 24% to 15% was observed. Plants struggling to meet turbidity compliance will certainly continue to struggle under the more stringent LT2 requirements for *Cryptosporidium*. If any of the struggling plants have significant occurrences of *Cryptosporidium* (which must be determined by required monitoring), they will most likely require additional removal of pathogens and more stringent treatment. In all likelihood, plants struggling with turbidity removal will require capital projects to continue to meet more stringent regulations. Some PRASA projects that are currently under development or are being implemented include provisions to comply with this future regulation, including projects at Hatillo-Camuy, Sanamuerto and Enrique Ortega WTPs. Moreover, PRASA has established policy for new WTPs to be designed for an effluent turbidity level of 0.1 NTU although the current regulatory limit is 0.3 NTU.

Once the results of source water monitoring have been tabulated for each WTP, and Bin Classifications (level of additional treatment required) made, this can be used to determine the appropriate compliance strategy for each WTP. Plants will complete this source monitoring between by 2012.

4.5.3 Likely Effects of the GWR on PRASA

The GWR has two primary requirements: completing sanitary surveys and triggered source water monitoring. Because systems will not be completing their own surveys, PRASA will need to work closely with PRDOH and provide it with all the necessary information to complete the sanitary surveys. The rule also requires source water monitoring. It is important to note that the rule gives PRDOH many enforcement options. Hence, PRASA and PRDOH can work together to determine how to implement the rule.

4.5.4 Likely Effects of the Future Contaminants on PRASA

Based on available information, no determinations could be made to determine the likely impact on PRASA due to potential regulations from candidate future contaminants which include, but are not limited to: endocrine disrupting compounds, pharmaceuticals and personal care products, N-nitrosodimethylamine (NDMA), chromium (VI), perchlorate, and algal toxins. Treatment for emerging contaminants varies greatly depending upon the nature of the contaminant. However, several of the above contaminants require advanced treatment technologies to be used as effective measures for mitigation. Some of the possible technologies available are:

- Carbon – Granular Activated Carbon has been shown to be an effective barrier for naturally occurring organic matter in some cases as well as has adsorptive capacity to remove certain pharmaceuticals and endocrine disruptors.

- NF/RO – In order to remove the most persistent contaminants, high pressure filtration methods are necessary to mitigate contamination. This comes at a high cost to the public utility.
- UV – Ultraviolet (UV) radiation is being used throughout the industry to address concerns with DBP formation and cryptosporidium inactivation. Evidence suggests that UV radiation may play a role in helping to address some emerging contaminates as well.
- AOP – Advanced Oxidation Processes can be used with or without UV radiation to aggressively treat total organic carbon (TOC) and initial evidence suggests AOP may be used to treat some contaminates of concern.

4.6 Master Plan Updating

The 2010–2030 PRASA Master Plan Update was completed in April of 2011. The 2010–2030 Master Plan provides PRASA with a clear roadmap for the implementation of its future investments in water and wastewater infrastructure over the next 20 years. PRASA is currently evaluating, comparing, and merging its existing CIP inventory with the one provided by the updated 2010-2030 Master Plan. Subsequently, PRASA plans to continuously revise its Master Plan in order to maintain its CIP updated with the System necessities. Additional modifications to PRASA's Master Plan may be warranted as conversations with Regulatory Agencies continue and additional regulatory requirements arise.

4.7 Conclusions

PRASA's CIP generally addresses the needs of the System and complies with PRASA's existing commitments with regulatory agencies. The CIP includes projects that cover a broad array of current and future needs, as identified by PRASA and as required by consent decrees. The CIP also includes funding for PRASA's R&R program. However, given PRASA's high rate of leaks and overflows, and continuing aging infrastructure, additional funds and an acceleration of the R&R program may be required in order to reduce/minimize these incidences. Finally, PRASA's CIP includes funding for preventive maintenance improvements, as well as for other necessary infrastructure projects (i.e., fleet and building renovation, and technological improvements) essential to maintaining and preserving the utility assets.

PRASA's classification and prioritization process allows for an organized and systematic management of the CIP. Projects are not only classified by category, group and type, but are also ranked according to a prioritization score which allows PRASA to easily identify priority projects as the CIP evolves. By categorizing and prioritizing the projects in the CIP, PRASA is able to keep track of mandatory-driven projects versus the non-mandatory, and make adjustments as projects move from planning through start-up. Presently, regulatory agencies and PRASA's PMCs actively participate in the project planning and design phases, providing support to PRASA in the project development process, overseeing compliance with consent decrees, and searching for innovative solutions to comply with current, and when applicable, future regulations.

PRASA will need to perform additional assessments and implement operational changes or additional capital improvements to bring non-compliant facilities into compliance. However, PRASA's record of compliance with the milestones of the 2006 Consent Decree and PRDOH Agreement supports PRASA's ongoing commitment to bring its System into compliance.

The full impact of future regulations and other regulatory requirements on PRASA's System are not known at this time. In some cases, future regulations and additional regulatory requirements are expected to require minor process changes and in other cases major capital improvements, such as construction of new treatment processes and intensive repair programs. In general, the existing CIP does not include projects intended solely to address future regulations or additional regulatory requirements that may be imposed on PRASA. As the impact of future regulations becomes more defined, CIP modifications will be required to adequately accommodate resulting needs.

5 Financial Analysis

5.1 Introduction

In the preparation of this Supplemental Report, MPPR/Malcolm Pirnie reviewed the PRASA-prepared financial forecast (the Forecast) shown in Exhibit 1 (enclosed at the end of this section). This section summarizes the findings of MPPR/Malcolm Pirnie's review and provides an assessment of the reasonableness of PRASA's assumptions in the preparation of the Forecast. The purpose of this review was to assess the sufficiency of the proposed financial plan to provide the revenues necessary to support the projected costs shown in Exhibit 1, including O&M expenses, debt service payments, required reserve deposits and other payments. Additionally, the Forecast illustrates the anticipated debt service coverage (DSC) for the five fiscal years from July 1, 2011 through June 30, 2016 (the forecast period).

The Forecast represents PRASA's estimate of the most probable results of operations and debt service requirements for the forecast period. Thus, it reflects PRASA's judgment, based upon present circumstances, as to the most likely set of conditions and course of action. MPPR/Malcolm Pirnie worked closely with PRASA to obtain the information necessary to support its conclusions regarding the Forecast. The following information, provided by PRASA, was used in this review:

- PRASA's FY2012 annual budget
- PRASA's revenue and expense projections and calculated net operating income and the preliminary debt service requirements
- Audited financial statements for FY2009, FY2010, and FY2011
- Actual detailed expenses for FY2009, FY2010, and FY2011, and budgeted expenses for FY2012
- Debt service schedules for all currently outstanding debt service and preliminary projected debt obligations (provided by underwriters)
- 2008 Master Agreement of Trust (2008 MAT)
- Amended and restated Master Agreement of Trust (2012 MAT)
- 2009 Fiscal Oversight Agreement (2009 FOA)
- Amended and restated Fiscal Oversight and Support Agreement (2012 FOA)

The following presents a summary of the financial review and MPPR/Malcolm Pirnie's assessment of the reasonableness of the Forecast and its key underlying assumptions regarding

water consumption (demand) and sales, customer growth, revenues, O&M expenses, capital expenditures and debt service.

5.2 PRASA's Rate Structure

PRASA implemented a two-phase rate increase effective October 10, 2005 and July 1, 2006. This was the last time PRASA increased its rates. Resolution No. 2167 (the Resolution) was approved on October 6, 2005 by PRASA's Board of Directors after recommendation by PRASA's Executive President and the Board's Revenue Committee. The Resolution included provisions for future increases as outlined below:

a) Rates for water and sewer service are not allowed to be increased prior to July 1, 2009 (FY2010);

b) Increases after July 1, 2009 will be calculated according to a specified formula (Coefficient of Annual Adjustment [CAA] described below);

c) Beginning July 1, 2009, there is a cap or limit on future annual increases of 4.5% and a limit on the cumulative increases of 25%;

d) If PRASA requires an increase in excess of 4.5% in any single year, or once the 25% cumulative limit is reached, PRASA must follow the formal approval process for requesting a rate increase.

Increases implemented after July 1, 2009 are limited by the calculation of the CAA described in the Resolution. There are three steps to determining the CAA as follows:

STEP 1 – Calculate the Coefficient of Deficiency (CD) for the applicable year:

$$CD = \frac{\text{Operating Expenses and Debt Service}}{\text{Operating Revenues}}$$

STEP 2 – Calculate the Annual Base Coefficient (CAB) for the Base Year:

$$CAB = \frac{\text{Operating Expenses and Debt Service (FY2007)}}{\text{Operating Revenues (FY2007)}}$$

STEP 3 – Calculate the CAA:

$$CAA = CD/CAB$$

If the CD for any year is greater than the CAB from FY2007, i.e., CD for FY2010 greater than CAB, then the rates can be increased by the lesser of the CAA less one (CAA-1) or 4.5% until the 25% cumulative maximum is reached.

The rates that are currently in place are based on the public utility ratemaking principles taken from Principles of Public Utility Rates[13] and promote water conservation. The rate structure for water and wastewater services consists of a fixed monthly base charge per account and a volumetric consumption rate for residential, commercial, industrial and government customer classes. The fixed base charge varies with the size of the water service line and includes 10 cubic meters of monthly consumption regardless of total water use, while the volumetric rate is assessed based on the metered water consumption that exceeds the first 10 cubic meters per month.

All customers pay for service; however, PRASA does provide a 35% subsidy to the base charge for residents over the age of 65 who are eligible under the Programa de Asistencia Nutricional ("PAN" Program) or residents under the Programa de Asistencia Temporal para Familias Necesitadas ("TANF" Program); both government assistance programs. Also, since FY2010, in compliance with ACT 69 approved by the Puerto Rico Legislative Assembly in August of 2009, PRASA provides a subsidy to all public housing customers in order to limit the monthly payments of these customers to only the water and wastewater base fee charge ($19.71 per month). In total, PRASA offers annual subsidies of approximately $16M to qualifying customers. Table 5-1 summarizes the number of residential customers that are provided a subsidy for water and wastewater bills as of July 31, 2011.

Table 5-1:
Water and Wastewater Subsidized Customer Accounts

Subsidy	Number of Customers	Percent of Total Residential Customers
PAN Subsidy	35,490	2.75%
TANF Subsidy	12,146	0.94%
Fixed Tariff (Public Housing)	51,476	3.99%
Total	**99,112**	**7.68%**

[13] James C. Bonbright, Albert L. Danielsen, and David R. Kamerschen with assistance from John B. Legler

PRASA's current rate structure for residential customers, effective since July 1, 2006, is shown in Tables 5-2 and 5-3 below.

Table 5-2:
Residential Monthly Base Charge per Account
(includes first 10 cubic meters of monthly consumption)

Water Service Line	Water	Wastewater	Water & Wastewater
1/2" & 5/8"	$10.60	$9.11	$19.71
3/4"	16.18	13.94	30.12
1"	26.58	17.90	44.48
1 1/2"	50.22	27.54	77.76
2"	85.49	47.09	132.58
3"	131.13	78.45	209.58
4"	294.97	137.76	432.73
6"	786.63	642.86	1,429.49
8"	1,258.61	734.69	1,993.30
10"	2,013.79	1,175.50	3,189.29
12"	$3,222.06	$1,880.81	$5,102.87

Table 5-3:
Residential Volumetric Rate per Cubic Meter

Block	Monthly Usage (cubic meters)	Water	Wastewater	Water & Wastewater
1	>10 - 15	$1.10	$0.90	$2.00
2	>15 - 35	1.60	1.33	2.93
3	> 35	2.16	1.77	3.93

Based on FY2009 - FY2011 water usage, PRASA's average residential customer consumed 17 cubic meters of water. Table 5-4 shows a typical residential bill under existing water and wastewater rates for 17 cubic meters of use.

Table 5-4:
Residential Typical Bill
(Based on three-year average use of 17 cubic meters per month)

Monthly Usage (cubic meters)	Water	Wastewater	Water & Wastewater
17	$19.30	$16.27	$35.57

PRASA's current rate structure for non-residential customers (includes commercial, industrial and government customer classes), effective since July 1, 2006, is shown in Tables 5-5 through 5-7 below.

Table 5-5:
Non-Residential Monthly Base Charge per Account[1]
(includes first 10 cubic meters of monthly consumption)

Water Service Line	Water	Wastewater	Water & Wastewater
1/2" & 5/8"	$21.43	$17.67	$39.10
3/4"	31.73	28.00	59.73
1"	53.72	39.43	93.15
1 1/2"	107.64	66.14	173.78
2"	171.11	103.15	274.26
3"	384.09	214.40	598.49
4"	638.07	404.26	1,042.33
6"	1,607.67	1,296.75	2,904.42
8"	2,584.65	2,011.63	4,596.28
10"	4,135.45	3,218.61	7,354.06
12"	6,616.72	5,149.77	11,766.49

[1] Commercial, industrial and government customer classes.

Table 5-6:
Commercial and Government Volumetric Rate per Cubic Meter

Block	Monthly Usage (cubic meters)	Water	Wastewater	Water & Wastewater
1	>10 – 100	$1.53	$1.27	$2.80
2	>100 – 200	1.60	1.33	2.93
3	> 200	1.90	1.60	3.50

Table 5-7:
Industrial Volumetric Rate per Cubic Meters

Block	Monthly Usage (cubic meters)	Water	Wastewater	Water & Wastewater
1	> 10	$1.67	$1.40	$3.07

5.3 Master Agreement of Trust with Bondholders

In connection with the 2012 bond issue, on January 24, 2012 PRASA's Board of Directors authorized the execution of an amended and restated Master Agreement of Trust (2012 MAT) by and between PRASA and Banco Popular de Puerto Rico as Trustee. The 2012 MAT contains specific DSC requirements that must be met by PRASA. The requirements differ from those included in the 2008 MAT. The following sections provide a summary of the 2008 MAT requirements and the amendments included in the 2012 MAT.

5.3.1 2008 Master Agreement of Trust

Currently, all revenues are deposited by PRASA into PRASA's Revenue Fund and used to pay current expenses. On the second to last business day of each month, PRASA transfers the moneys on deposit in its Revenue Fund to the Deposit Fund. On the last business day of each month, the Trustee transfers the moneys on deposit in the Deposit Fund to the following funds in the following order or priority:

- Senior Bond Fund – to fund principal and interest payments on Senior Indebtedness;
- Senior Debt Service Reserve Fund – to fund deficiencies in the reserve fund upon the issuance of additional Senior Bonds or withdrawals or valuation losses;
- Senior Subordinate Bond Fund – to fund principal and interest payments on Senior Subordinate Indebtedness;
- Senior Subordinate Debt Service Reserve Fund – to fund deficiencies in the reserve fund upon the issuance of additional Senior Subordinate Bonds or withdrawals or valuation losses;
- Subordinate Bond Fund – to fund principal and interest payments on Subordinate Indebtedness;
- Subordinate Debt Service Reserve Fund – to fund deficiencies in the reserve fund upon the issuance of additional Subordinate Bonds or withdrawals or valuation losses;
- Operating Reserve Fund – to fund Operating Reserve Requirement and to pay reimbursement obligations on Operating Reserve Facilities;
- Capital Improvement Fund – to fund the Capital Improvement Fund Requirement;
- Commonwealth Payments Fund – to fund principal and interest on Commonwealth Guaranteed Indebtedness and Commonwealth Supported Obligations; and
- Surplus Fund – to fund the Rate Stabilization Fund and, thereafter, for any lawful purpose.

5.3.1.1 Debt Service Coverage and Additional Bonds Tests Requirements

PRASA's 2008 MAT with bondholders contained specific DSC requirements that had to be met. The 2008 MAT Rate Covenant requirements included the following:

- Net Revenues shall be sufficient in each fiscal year to be at least equal to 120% of the annual debt service with respect to the senior indebtedness for such fiscal year.
- Net Revenues shall be sufficient in each fiscal year to be at least equal to 110% of the annual debt service with respect to the senior indebtedness and the senior subordinate indebtedness for such fiscal year.
- Net Revenues shall be sufficient in each fiscal year to pay:
  - annual debt service on Indebtedness;
  - the amounts, if any, necessary to be deposited in any Senior Debt Service Reserve Account, Senior Subordinate Debt Service Reserve Account or Subordinate Debt Service Reserve Account to restore the respective amounts on deposit therein to the amount of the applicable Debt Service Reserve requirement;
  - the amount, if any, necessary to be deposited in the Operating Reserve Fund to maintain the balance therein at the Operating Reserve Fund requirement; and
  - the amount, if any, necessary to be deposited in the Capital Improvement Fund and the Rate Stabilization Account of the Surplus Fund in accordance with the annual budget for such fiscal year.

As defined and summarized from the 2008 MAT, Net Revenues is the difference between Revenues and Current Expenses. Current Expenses are the reasonable and necessary expenses, calculated on an accrual basis, to maintain, repair and operate the System, excluding non-cash reserves or expenses, e.g., depreciation expense. Indebtedness is defined as Bonds, Other System Indebtedness, Commonwealth Guaranteed Indebtedness (CGI) and Commonwealth Supported Obligations (CSO), collectively.

The DSC requirements of the 2008 MAT Rate Covenant vary by the seniority of the debt and are summarized in Table 5-8. The 2008 MAT also contained Additional Bonds Test (ABT) requirements that PRASA would have been required to meet had it decided to issue additional debt under the 2008 MAT. The ABT is a measure of whether or not the required DSC levels will still be met after the issuance of additional debt. Where two DSC values are shown for the ABT on Table 5-8, the first value is the minimum for net revenues divided by existing and proposed debt service (at the specific lien level). The second value is the minimum for net revenues divided by existing and proposed debt service (regardless of lien level) plus specified reserve fund deposits.

Table 5-8:
2008 MAT DSC Requirements

Lien Level	Debt Secured	DSC for Additional Bonds Test[1]	DSC for Covenant Test	In Default if DSC not Achieved?
Senior	2008 Senior Bonds	1.20 / 1.00	1.20	Yes
Senior Subordinate	Bank Term Loan	1.10 / 1.00	1.10	Yes
Subordinate	Not applicable currently	1.00	1.00	Yes
Below Subordinate	Commonwealth Guaranteed Indebtedness	N/A	1.00	No
Below Subordinate	Commonwealth Supported Obligations	N/A	1.00	No

[1] Under the 2008 MAT, two tests applied to future debt. The first test was net revenues divided by existing and proposed debt service (at the existing lien level); the second test was net revenues divided by existing and proposed debt service (regardless of lien level) plus specified Reserve Fund deposits.

5.3.2 2012 Amended Master Agreement of Trust

The following key amendments have been made to the 2008 MAT. The main objective of these amendments is to establish, in favor of bondholders, a gross revenue pledge to replace the net revenue pledge and to stabilize funding of Current Expenses.

5.3.2.1 Operating versus Authority Revenues

Under the 2012 MAT, two terms regarding revenues have been defined. These are: Authority Revenues and Operating Revenues.

Authority Revenues *"shall mean Operating Revenues plus (i) any governmental grants or appropriations available to pay Current Expenses of the Authority, including grants or appropriations received by the Authority and specifically made for the payments of principal of and interest on obligations of the Authority or for reimbursing the Authority for such payments, (ii) any amounts received from the Commonwealth of Puerto Rico on account of Commonwealth Guaranteed Indebtedness (which is required to be deposited directly in the Commonwealth Payments Fund) or Commonwealth Supported Obligations (which is required to be deposited in the Commonwealth Payments Fund) and (iii) any amounts transferred from the Budgetary Reserve Fund to the Trustee."*

Operating Revenues *"shall mean all moneys received by or on behalf of the Authority, including (i) the moneys derived by or on behalf of the Authority from the sale of water produced, treated or distributed by, or the collection, transmission, treatment or disposal of sewage by the Systems, (ii) any proceeds of use and occupancy insurance on the Systems or any part thereof, (iii) except as provided in the following sentence, any income from the investments made under this Agreement, (iv) any special assessments, including assessments in the nature of impact fees, (v) amounts, if any, paid from the Rate Stabilization Account into the Operating Revenue Fund in any Fiscal Year minus the amounts, if any, paid from the Operating Revenue Fund into the Rate*

Stabilization Account during the same Fiscal Year; and (vi) regularly scheduled payments received under any Qualified Swap or Hedge Agreement during such period. In no event shall Operating Revenues include (i) income from the investment of moneys on deposit to the credit of the Construction Fund, proceeds of insurance (except use and occupancy insurance) or condemnation awards (which are required to be deposited directly to the credit of the Capital Improvement Fund), (ii) proceeds of sales of property constituting a part of the Systems (which are required to be deposited directly to the credit of the Capital Improvement Fund), (iii) the proceeds of Bonds or other Indebtedness, (iv) any amounts transferred from the Budgetary Reserve Fund to the Trustee and (v) any termination or similar payment under any interest rate swap or similar hedge agreement received by the Authority (which are required to be deposited directly to the credit of the Capital Improvement Fund)."

5.3.2.2 Flow of Funds

Regarding the flow funds, the 2012 MAT includes the following changes:

- Senior, Senior Subordinate and Subordinate debt (and any debt that is secured on a parity therewith) takes priority over current operating expenses
- Commonwealth Guaranteed and Commonwealth Supported debt would continue to be funded/paid only after funding of current operating expenses
- All revenues shall be deposited by PRASA in the first instance to the Operating Revenue Fund to make the required deposits set forth below. The Trustee transfers the moneys on deposit in the Operating Revenue Fund to the following funds in the following order or priority:
  - Senior Bond Fund – to fund principal and interest payments on Senior Indebtedness;
  - Senior Debt Service Reserve Fund – to fund deficiencies in the reserve fund upon the issuance of additional Senior Bonds or withdrawals or valuation losses;
  - Senior Subordinate Bond Fund – to fund principal and interest payments on Senior Subordinate Indebtedness;
  - Senior Subordinate Debt Service Reserve Fund – to fund deficiencies in the reserve fund upon the issuance of additional Senior Subordinate Bonds or withdrawals or valuation losses;
  - Subordinate Bond Fund – to fund principal and interest payments on Subordinate Indebtedness;
  - Subordinate Debt Service Reserve Fund – to fund deficiencies in the reserve fund upon the issuance of additional Subordinate Bonds or withdrawals or valuation losses;
  - Current Expense Fund (a new fund under the 2012 MAT) – to fund current operating expenses of PRASA;

- Operating Reserve Fund – to fund Operating Reserve Requirement and to pay reimbursement obligations on Operating Reserve Facilities;
- Capital Improvement Fund – to fund the Capital Improvement Fund Requirement;
- Commonwealth Payments Fund – to fund principal and interest payments on CGI and CSO; and
- Surplus Fund – to fund the Rate Stabilization Fund and, thereafter, for any lawful purpose.

5.3.2.3 Budgetary Reserve Fund

Additionally, under the 2012 FOA, a new Budgetary Reserve Fund has been created. PRASA would initially fund the Budgetary Reserve Fund from bond proceeds – tax-exempt if permitted by applicable tax law. According to the 2012 FOA, GDB will hold the Budgetary Reserve Fund and will review and approve PRASA's five-year fiscal improvement plan with its corresponding Budgetary Reserve Requirement for such fiscal years. If the balance in the Budgetary Reserve Fund falls below a certain level (i.e., transfers exceed the amount budgeted for the fiscal year or insufficient funds are available to cover the additional revenue requirement for the ensuing fiscal year) the Commonwealth agrees that, starting in FY2013 and for each fiscal year thereafter, it shall either (i) request an appropriation or provide another funding source for the projected Budgetary Reserve Requirement applicable to the next succeeding fiscal year (for example, in FY2012, as part of the FY2013 budget, the Commonwealth will request an appropriation or funding source sufficient to cover estimated Budgetary Reserve Requirement for FY2014) or (ii) advise PRASA that it does not intend to request an appropriation to cover all or a portion of the projected Budgetary Reserve Requirement for such next succeeding fiscal year. If the DSC requirement under the Rate Covenant is not met, and neither the Commonwealth nor the GDB advance funds to PRASA to cover shortfalls, PRASA would then be required to implement revenue enhancement and/or expense reducing measures, implement a rate structure change (i.e., implement a rate increase, or a combination of these measures, in order to satisfy the requirements of the 2012 MAT.

5.3.2.4 Rate Covenant

The 2012 MAT includes modifications to the 2008 MAT Rate Covenant which PRASA must meet. These modifications are described below and summarized in Table 5-9.

As stated in the 2012 MAT, PRASA has covenanted to establish and collect rates, fees and charges so that it meets the following four independent requirements (which will be calculated annually no later than six months after the end of each fiscal year based on Operating Revenues and Authority Revenues set forth in PRASA's most recent audited financial statements):

- Operating Revenues shall be at least equal to 250% of annual debt service with respect to Senior Indebtedness for the current fiscal year;

- Operating Revenues shall be at least equal to 200% of annual debt service with respect to Senior Indebtedness and Senior Subordinate Indebtedness for the current fiscal year;
- Operating Revenues shall be at least equal to 150% of annual debt service with respect to all Bonds and Other System Indebtedness for the current fiscal year; and
- Authority Revenues, shall be sufficient in each fiscal year to be at least equal to:
  - Annual debt service on Indebtedness;
  - Current expenses;
  - the amounts, if any, necessary to be deposited in any Senior Debt Service Reserve Account, Senior Subordinate Debt Service Reserve Account or Subordinate Debt Service Reserve Account to restore the amount on deposit therein to the amount of the applicable Debt Service Reserve Requirement (provided that each such Accounts will be deemed to be funded at the applicable Debt Service Reserve Requirement for so long as the deposits required by the [2012 MAT] are being made);
  - the amount, if any, necessary to be deposited in the Operating Reserve Fund to maintain the balance therein at the Operating Reserve Fund Requirement; and
  - the amount, if any, necessary to be deposited in the Capital Improvement Fund and the Rate Stabilization Account of the Surplus Fund in accordance with the Annual Budget for the current fiscal year.

Should PRASA decide to issue additional debt while any of the debt issued under the 2012 MAT is outstanding, the ABT requirements of the 2012 MAT would also have to be met. The ABT is a measure of whether or not DSC will still be met after the proposed, additional bonds are issued. The modified ABT requirements which PRASA must meet (under the 2012 MAT) include the following:

- Senior Bonds ABT
  - Operating Revenues are at least equal to 2.5x Senior Bonds maximum annual debt service; and
  - Operating Revenues are at least equal to 1.5x maximum annual debt service on all System Indebtedness.
- Senior Subordinated Bonds ABT
  - Operating Revenues are at least equal to 2.0x combined Senior Bonds and Senior Subordinate Bonds maximum annual debt service; and
  - Operating Revenues are at least equal to 1.5x maximum annual debt service on all System Indebtedness.

- Subordinated Bonds ABT
  - Operating Revenues are at least equal to 1.5x maximum annual debt service on all System Indebtedness

Table 5-9:
Summary of 2012 MAT DSC Requirements

Lien Level	Debt Secured	DSC for Additional Bonds Test[1]	DSC for Covenant Test	In Default if DSC not Achieved?
Senior	2008 / 2012 Senior Bonds	2.5/1.5	2.5	Yes
Senior Subordinate	Bond Anticipation Note	2.0/1.5	2.0	Yes
Subordinate	Not applicable currently	1.5	1.5	Yes
Below Subordinate	Commonwealth Guaranteed Indebtedness	N/A	1.0	No
Below Subordinate	Commonwealth Supported Obligations	N/A	1.0	No

[1] Two tests apply to future debt. The first test is Operating Revenues divided by existing and proposed debt service (at the existing lien level); the second test is Operating Revenues divided by existing and proposed debt service (regardless of lien level) plus specified Reserve Fund deposits.

5.3.2.5 Annual Budget and Disbursement Schedule

As stated in the 2012 MAT, PRASA shall adopt a budget (the Annual Budget) for the operation of the Systems for the ensuing fiscal year. In addition to the Annual Budget, the 2012 MAT requires PRASA to also prepare an annual Disbursement Schedule for the payment of Current Expenses (as defined in the 2012 MAT). Each annual Disbursement Schedule shall be prepared in such manner as to show in reasonable detail, the Current Expenses expected to be incurred during the fiscal year (calculated on a cash basis), including (i) all cash disbursements contained in the Annual Budget for the fiscal year, (ii) expenses that may have accrued in prior years and are expected to be paid in the current fiscal year, (iii) amounts that are necessary to pay for or result from an emergency condition, (iv) amounts that are necessary to pay judgments or otherwise result from the settlement of litigation, (v) project expenditures that the PRASA has determined to capitalize, (vi) amounts that are necessary to be advanced for costs of improvements and (vii) other similar disbursements. The Disbursement Schedule shall be updated by PRASA and submitted to the Trustee and the GDB on a monthly basis.

5.4 Fiscal Oversight and Support Agreement

In connection with the 2012 bond issue, on January 24, 2012 PRASA's Board of Directors authorized the execution of an amended and restated Fiscal Oversight and Support Agreement (2012 FOA) by and between PRASA, the Commonwealth of Puerto Rico and the GDB. A summary of the major requirements of the 2009 FOA, as well as the amendments included in the 2012 FOA are described below.

5.4.1 2009 Fiscal Oversight Agreement

On July 9, 2009 PRASA and the GDB entered into a FOA that assigned responsibilities to the GDB as fiscal agent of PRASA. At the time, PRASA faced liquidity constraints which negatively affected its financial position, primarily due to:

- reduced levels of income caused in part by increased levels of uncollectible or past-due accounts;
- significant increases in energy costs; and
- uncertainty in the financial and credit markets, which combined with high levels of debt, limited PRASA's access to interim financing for its CIP projects.

PRASA requested GDB and GDB agreed to provide financial assistance to PRASA in the form of an emergency liquidity support facility under the terms of that certain credit agreement entered into between GDB and PRASA. GDB required PRASA to implement a comprehensive expense reduction program, including certain fiscal oversight controls (subject to existing laws, agreements, and commitments) designed to minimize future rate increases and to protect and improve the overall financial health and credit rating of PRASA. In turn, this would allow PRASA to obtain adequate financing to fund its CIP and operate the system in an efficient and reliable manner, in compliance with applicable laws and regulations and other regulatory requirements.

Under the 2009 FOA, GDB agreed to provide emergency financial assistance to PRASA, expressly conditioned upon PRASA's ability to achieve the financial performance metrics as delineated in the 2008 MAT, including the Rate Covenant as set forth therein. Also, through the 2009 FOA, GDB retained the right to monitor and enforce PRASA's compliance with such covenants, the 2008 MAT and the 2009 FOA. Also the 2009 FOA gave the GDB the authority to serve as fiscal agent for PRASA with respect to all bonds, notes or any other evidence of indebtedness issued, purchased, sold or exchanged by PRASA. Additionally, PRASA agreed to maintain continuous disclosure with GDB and, as such, meet certain reporting requirements.

5.4.2 2012 Amended Fiscal Oversight and Support Agreement

Some key amendments that have been included in the 2012 FOA are the following:

- PRASA will develop and implement a multi-year financial and operating plan (the Financial Improvement Plan) that establishes milestones for PRASA to achieve self-sufficiency through rate and cost adjustments.
- GDB will review and provide recommendations to PRASA regarding its preliminary Annual Budget, Disbursement Schedule and CIP, amongst others, prior to approval of PRASA's Board of Directors.

- As established under the 2012 FOA, GDB agrees to hold a Budgetary Reserve Fund in trust for PRASA intended to cover the Budgetary Reserve Requirement for each fiscal year; this Budgetary Reserve Requirement shall be equivalent to the amount projected by PRASA to be required in such fiscal year as financial support from the Commonwealth.
- To the extent that PRASA fails to seek or receive an appropriation from the Commonwealth in an amount equal to at least the Budgetary Reserve Requirement for a fiscal year, PRASA shall be obligated to implement revenue enhancement and/or expense reduction measures, revise its rate structure (i.e., rates, fees and charges), or a combination of these measures, to ensure that it will be in compliance with the Rate Covenant set forth in Section 7.01 of the 2012 MAT.
- PRASA shall comply with certain reporting requirements (to be submitted to GDB) including, but not limited, to the monthly Disbursement Schedule included and defined in the 2012 MAT.

GDB will continue to act as fiscal agent for PRASA and PRASA shall continue to comply with the continuous disclosure and reporting requirements of the 2012 FOA.

5.5 FY2012 – FY2016 Forecast

Considering the requirements of the 2012 MAT and the 2012 FOA including, but not limited to, the amended Rate Covenant, PRASA has prepared a five-year financial projection for fiscal years 2012 through 2016. MPPR/Malcolm Pirnie reviewed the PRASA prepared FY2012 budget and the Forecast for FY2013 through FY2016 shown in Exhibit 1.

The Forecast presents PRASA's estimate of the expected results of operations and DSC for the forecast period. Thus, the Forecast reflects PRASA's judgment, based upon present circumstances, as to the most likely set of conditions and course of action. However, there will usually be differences between forecasted and actual results, because events and circumstances frequently do not occur as expected, and those differences may be material. MPPR/Malcolm Pirnie has no responsibility for updating this Supplemental Report for changes that occur beyond the date of its issuance. PRASA's revenue projections, on a cash basis; expenses, on an accrual basis; and their respective assumptions are discussed below.

5.5.1 Operating Revenues

As defined in the 2012 MAT, Operating Revenues include:

- the moneys derived by or on behalf of PRASA from the sale of water produced, treated or distributed by, or the collection, transmission, treatment or disposal of sewage by the Systems;
- any proceeds of use and occupancy insurance on the Systems or any part thereof;

- certain income from investments made under the 2012 MAT;
- any special assessments, including impact fees;
- net amounts, if any, paid from the Rate Stabilization Account into the Operating Revenue Fund in any fiscal year; and
- regularly scheduled payments received under any Qualified Swap or Hedge Agreement.

Operating Revenues exclude any governmental grants or appropriations available to pay Current Expenses of PRASA, including grants or appropriations received by PRASA and specifically made for the payments of principal of and interest on obligations of PRASA.

PRASA's Operating Revenues projections, on a cash basis, and associated assumptions are discussed below:

1. Base Fee and Service Charges (Exhibit 1, line 2) – PRASA's single largest source of revenue is from the monthly base charge and volume rate for service. PRASA's FY2012 Annual Budget projection includes revenues from Base Fee and Service Charges (Service Revenues) of $740 M, approximately $27M more than FY2011 results. This represents an expected increase of 4% in FY2012. PRASA's Forecast projections for FY2013 through FY2016 include service revenues of $730M, approximately $17M more (or 2%) than the FY2011 $713M results. This amount is based on the average of the results for FY2011 ($713M), FY2010 ($741M), and FY2009 ($759M). PRASA is forecasting that Base Fee and Service charges will remain steady over the forecast period.

   FY2011 results indicate PRASA did not achieve its Service Revenues budget of $754M and the results were in fact 5% lower than budgeted amounts, and approximately 4% lower ($27M) than FY2010 actual results. However, the decline in Base Fee and Service Charges during FY2011 are mostly due to one-time prior years' service charge adjustments that were recorded in FY2011, which had no impact on cash collections for the year. These adjustments are the result of negotiations completed by PRASA with customers to collect old debts or outstanding bills for service; negotiations included adjustments of debts that were unverifiable or deemed unreasonable by PRASA.

   PRASA has experienced a modest growth in its number of accounts of approximately 0.74% per year from FY2004 to FY2011, shown in Table 5-10 below. However, PRASA is assuming a conservative forecast of customer growth going forward by projecting a zero percent (0%) customer growth rate in future fiscal years.

Table 5-10:
Customer Accounts FY2004 – FY2011

Fiscal Year	Customer Class				
	Residential	Commercial	Industrial	Government	Total
2004	1,145,963	67,375	1,528	11,033	1,225,899
2005	1,161,350	68,093	1,533	11,584	1,242,560
2006	1,173,040	68,396	1,526	11,688	1,254,650
2007	1,178,677	67,560	1,472	11,706	1,259,415
2008	1,181,366	63,004	1,447	11,519	1,257,336
2009	1,184,661	61,657	1,280	11,290	1,258,888
2010	1,204,636	62,938	1,237	10,946	1,279,757
2011	1,215,896	62,753	1,219	10,932	1,290,800
CAGR[1] FY2004-FY2011	**0.85%**	**-1.01%**	**-3.18%**	**-0.13%**	**0.74%**

[1] CAGR = Compound Annual Growth Rate

Another factor that contributed to the decline in FY2011 Service Revenues was a reduction in demand for utility services. Total consumption in FY2011 decreased over 1% compared to FY2010, as shown in Table 5-11.

Table 5-11:
Average Monthly Billed Consumption by Class FY2010 – FY2011
(1,000 Cubic Meters)

Fiscal Year	Customer Class				
	Residential	Commercial	Industrial	Government	Total
FY 2010	20,554	3,152	869	2,738	27,313
FY 2011	19,721	3,350	1,153	2,788	27,013
% Difference	**-4.05%**	**6.28%**	**32.68%**	**1.83%**	**-1.10%**

This reduction in consumption along with an increase in the total number of customers represents a decrease in the average billed consumption per account of approximately 1.9%, presented in Table 5-12.

Table 5-12:
Average Monthly Consumption per Account FY2010 – FY2011
(Cubic Meters)

Fiscal Year	Customer Class				
	Residential	Commercial	Industrial	Government	Total
FY 2010	17.06	50.08	702.51	250.14	21.34
FY 2011	16.21	53.38	945.86	255.03	20.93
% Difference	**-4.98%**	**6.59%**	**34.64%**	**1.95%**	**-1.92%**

FY2012 year-to-date (YTD) results through November 30, 2011 show that the average monthly billed consumption is slightly below (2%) the FY2011 results. Also, Base Fee and Service Revenues are below the FY2012 budget target by approximately 7.5%.

Given the FY2011 results and FY2012 YTD results, MPPR/Malcolm Pirnie believes the $730M projected for the rest of the forecast period is reasonable. However, is should be noted that continued strain on the economy could cause further decline in the consumption patterns of PRASA customers, resulting in still further reductions in projected revenues. Hence, FY2012 YTD results should be closely monitored and projections for subsequent fiscal years shall be adjusted accordingly.

2. Operational Initiatives (Exhibit 1, lines 3 & 4) – PRASA has projected revenues of $60M from Operational Initiatives for FY2012 through FY2014, and of $44M and $45M for FY2015 and FY2016, respectively. As mentioned in Section 3 of this report, PRASA's Operational Initiatives are a set of programs implemented to optimize revenue collection. The Revenue Optimization Program is the most significant (in terms of additional revenue potential) of these initiatives and has shown encouraging results in each of the past three fiscal years. Additionally, PRASA has included additional revenue benefits resulting from the Customer Geodatabase and the AMR/AMI System for Large Meter projects. A summary of the estimated annual benefits of these Operational Initiatives, as provided by PRASA and its consultant, is shown in Table 5-13 below.

Table 5-13:
Operational Initiatives Projections for FY2012 – FY2016
($, Thousands)

Initiative	FY 2012 Projection	FY2013 Projection	FY2014 Projection	FY2015 Projection	FY2016 Projection
Small Meters	$27,285	$31,318	$33,574	$34,431	$35,216
Degradation	(7,000)	(7,000)	(7,000)	(7,000)	(7,000)
Large Meters	7,467	7,801	7,011	6,433	5,813
Theft and Tx[1] Accounts	7,902	8,715	7,729	3,661	3,661
Sprinklers	1,406	1,549	882	882	882
Collection Management	1,250	625	625	-	-
Disconnections	15,950	13,750	11,550	-	-
Inactive Accounts	320	320	-	-	-
Class Correction	2,372	2,488	2,488	2,488	2,488
Condominiums	2,037	2,037	2,037	2,037	2,037
Miscellaneous	1,353	1,353	-	-	-
Geodabatase Cadaster & AMR/AMI[2] Large Meter Clients (Metro Region)	-	-	-	1,068	1,903
Total Estimated Annual Benefits	**$60,341**	**$62,956**	**$58,896**	**$44,000**	**$45,000**
PRASA Projection	**$60,000**	**$60,000**	**$60,000**	**$44,000**	**$45,000**

[1] Inactive customer accounts with consumption.
[2] AMR/AMI (Automatic Meter Reading / Advanced Metering Infrastructure)

MPPR/Malcolm Pirnie believes PRASA has a strong commitment to the Operational Initiatives program (as evidenced by the associated results) and to achieving goals outlined for each initiative. FY2012 YTD results show that PRASA has collected approximately $24M of additional revenues from its operational initiatives. Based on current and historical results of the program, and the Operational Initiatives program analysis executed by PRASA and its consultants, it is reasonable to expect that the projected incremental revenues resulting from the Operational Initiatives for the forecast period, in general, may be attainable. Nonetheless, PRASA's assumption for the incremental revenues from Operational Initiatives relies on the effective and timely implementation of these initiatives.

3. Collections Lag and Uncollectibles Reserve (Exhibit 1, line 5) – Prior to the two-stage 128% rate increase, implemented October 10, 2005 and July 1, 2006, PRASA's historical percentage of uncollectible accounts was approximately 4% of Service Revenues. In the years following the two-stage rate increase, PRASA's uncollectible accounts value has increased to approximately 12% of Service Revenues. Current local economic conditions, an increase in unemployment, and a reduction in the average household income have likely negatively impacted affordability and the ability of PRASA's customers to pay their utility bills. Yet, from FY2009 to FY2010, PRASA's rate of uncollectible accounts actually decreased from approximately 18% to 12%; while in FY2011 PRASA collected more than the net billed amount as a result of its reserve for uncollectible accounts to approximately 3% of Base Fee and Service Charges, partly as a result of PRASA's initiative to adjust and collect outstanding debt (mostly from government accounts) from prior years.

   PRASA's FY2012 Annual Budget project includes a reduction in revenues of $54M as a reserve for uncollectible accounts, representing a $38M increase in the reserve when compared to FY2011 results (mainly due to the FY2012 budgeted increase in Base Fee and Service Charges). This results in a reserve for uncollectible accounts percentage of approximately 7%. FY2012 YTD results through November 30, 2011 demonstrate that PRASA is currently at an 8% uncollectible rate, which represents a negative deviation from the budgeted target of 7%. For FY2013 through FY2016, PRASA is assuming an uncollectible rate of approximately 10% of projected Service Revenues in each fiscal year. MPPR/Malcolm Pirnie finds PRASA's assumption for the uncollectible budget rate to be in line with FY2010, FY2011 and FY2012 YTD results; however, considering the current economic environment and the high unemployment rate in Puerto Rico[14], MPPR/Malcolm Pirnie cautions that the rate for uncollectible accounts could increase. As such, PRASA should closely monitor its rate of uncollectible accounts throughout FY2012 and adjust its projections as needed.

[14] Based on the United States Bureau of Labor Statistics, as of June 2011 the unemployment rate in Puerto Rico was 16.1% which is one percent lower than reported in June 2010; Source: www.stats.bls.gov

4. Subsidy (Exhibit 1, lines 6 and 7) – PRASA's Forecast includes a reduction in revenues to reflect the subsidy offered to customers who qualify for the Programa de Asistencia Nutricional (PAN Program) or residents under the Programa de Asistencia Temporal para Familias Necesitadas (TANF Program). The subsidy, approved in October of 2005 by PRASA's Board of Directors, provides a 35% base charge discount to PAN or TANF-eligible customers, i.e., qualifying seniors over 65 years of age, disabled persons, and families in need of temporary assistance.

   PRASA has calculated the full impact of this subsidy to be approximately $17M annually if all eligible customers apply for and meet the qualification criteria (estimated at 210,000 customers). However, PRASA does not expect all 210,000 eligible customers to apply for the subsidy and therefore does not forecast the subsidy to reach the $17M level. For the last three fiscal years this subsidy has totaled approximately $3.2M per year. The Forecast assumes the level of the subsidy at $4M in FY2012 and in each year of the forecast period.

   Also, in August of 2009 Puerto Rico's Legislative Assembly approved Act 69 which includes a partial subsidy for water and wastewater consumption costs for residents of public housing projects. PRASA originally projected that this new subsidy program could cost approximately $16.2M in additional subsidy assistance offered to PRASA customers who qualify (estimated based on a full-year participation of the eligible customers). In FY2010 and FY2011 this subsidy totaled $7M (the implementation of the program did not occur for the entire 12-month period) and $12M, respectively. PRASA is projecting that in FY2012 and in each year of the forecast period it will grant approximately $12M in assistance to qualified customers based on a full program year.

   While it is difficult to predict the impact that any new subsidy will have on PRASA's revenues, recent history has shown that subsidy participation is usually low. Hence, MPPR/Malcolm Pirnie believes that PRASA's subsidy estimate over the Forecast is reasonable but should be re-assessed on an annual basis in case participation is higher than expected.

5. Miscellaneous Income (Exhibit 1, line 8) – PRASA projects $4M from miscellaneous income in FY2012 and in each year of the forecast period. This miscellaneous income includes mainly fines, reconnection charges, bulk water sales, other miscellaneous revenues, and interest income. Results show that PRASA collected $3.3M in miscellaneous income in FY2011. FY2012 YTD results through November 30, 2011 show that PRASA is currently below or short of the budget amount for FY2012. However, this is a typical trend that usually corrects itself during the third and fourth quarters of the fiscal year. Hence, MPPR/Malcolm Pirnie finds these projections reasonable based on results from previous years. Fines should be closely monitored due to the economic situation, as the uncollectible rate for these fines may be higher than previous years.

6. Special Assessments (Exhibit 1, line 9) – PRASA collects revenues from new service installations. This fee is collected from developers and applies to new water and sewer connections to the System. The current fees are $500 each for water and sewer connections ($1,000 total per unit). Special Assessments depend on the fees paid by developers of new projects and it is expected that the current economic situation will continue to impact the local new housing market during the next few years.

   PRASA generated $6.8M in FY2011 from Special Assessments, half the amount generated in FY2008. This four-year downward trend is consistent with the current economic situation and its impact on the local housing market. PRASA projects $5M from Special Assessments during FY2012. The $5M projection for Special Assessments, although lower than the most recent three-year average of $10.8M, is in line with the FY2011 preliminary results. However, this revenue source is exclusively dependent upon economic conditions, and could be lower than the FY2011 level if the recession continues. Due to the current status of the Puerto Rico housing market, FY2012 YTD results through November 30, 2011 show that PRASA is currently off or below target with its budget. If this trend continues throughout the fiscal year, PRASA will not be able to meet its Special Assessments' budget. Considering the FY2012 YTD results, PRASA has included $3M in its Forecast for FY2013 through FY2016 Special Assessments. MPPR/Malcolm Pirnie finds this projection reasonable. Results should be closely monitored in case economic conditions further deteriorate new developments.

7. Rate Stabilization Account (Exhibit 1, line 10) – In accordance with the MAT, a Rate Stabilization Account, the balance of which is determined in the annual budget, must be established. This account is established within the Surplus Fund which contains any remaining moneys after all the required deposits are made. Equal monthly deposits over the fiscal year must be deposited to the account to make the balance in the fund equal to the balance set forth in the annual budget. Given PRASA's current financial situation, PRASA has not projected that any funding will be available for establishing a Rate Stabilization Account over the forecast period.

5.5.2 Other Sources of Revenues

In FY2011, PRASA received a contribution of $105M from the Central Government General Fund to fund an otherwise anticipated operational deficit. In FY2012, a similar contribution was approved by the Puerto Rico Legislature in the Central Government's annual budget. As of December 31, 2011, PRASA received $70.3M of the $183.9M approved from this assignment in FY2012. Based on FY2011 and FY2012 YTD results, PRASA may be able secure government appropriations in future years if necessary. However, because Central Government contributions require legislative approval and are subject to the availability of funds in the Central Government's annual budget, PRASA's ability to secure these funds in future years is uncertain.

In order to supplement its future revenue requirements and to comply with the requirements of Section 7.01 of the 2012 MAT, PRASA is projecting that other funding sources will be available from either transfers from the Budgetary Reserve Fund[15] or the implementation of rate increases. After FY2013, PRASA is projecting draws from the Budgetary Reserve Fund in amounts of $95M and $145M in fiscal years 2012 and 2013, respectively. The Forecast shows that PRASA projects funding deficits in the amount of $330M, $385M, and $420M for FY2014, FY2015, and FY2016, respectively. PRASA is projecting that these deficits will be covered with additional transfers from the Budgetary Reserve Fund, from the implementation of rate increases, from other measures to increase revenues and/or reduce costs, or from a combination of these measures. MPPR/Malcolm Pirnie agrees that these projected deficits are mostly accurate. While PRASA's financial forecast does not specify how the Budgetary Reserve Fund will be funded once its initial funding has been depleted, the 2012 FOA clearly states that PRASA shall be obligated to implement revenue enhancing and/or cost reducing measures, revise its rates and fees, or implement a combination of these measures, in the case the Commonwealth fails to seek or receive an appropriation or provide another source of funding to satisfy the Budgetary Reserve Requirement. While PRASA has raised rates in recent years due to the local economic situation in Puerto Rico, the Commonwealth has provided the necessary funding to cover deficits in FY2010, FY2011 and FY2012. As such, it is MPPR/Malcolm Pirnie's opinion that it is reasonable to assume that support from the Commonwealth will continue if PRASA is unable to raise rates during the forecast period.

5.5.3 Operating (Current) Expenses

As defined in the 2012 MAT, **Current Expenses** "*shall mean the reasonable and necessary current expenses, incurred by the Authority in the ordinary course of business, calculated on an accrual basis, of maintaining, repairing and operating the properties constituting the Systems or causing said maintenance, repair and operation, which expenses shall exclude depreciation, reserves for allowances for doubtful accounts and other non-cash reserves or expenses. For purposes of [the Rate Covenant] and the Annual Budget required by Section 7.02 [of the 2012 MAT], Current Expenses will be calculated on an accrual basis. For all other purposes of [the 2012 MAT], Current Expenses will be calculated on a cash basis. Notwithstanding any accounting treatment to the contrary, the amount of any termination or similar payment under any interest rate swap or similar hedge agreement shall, if payable by the Authority, not be taken into account in computing Current Expenses to the extent the same is paid by or on behalf of the Authority from the proceeds of any Indebtedness.*"

[15] Note: transfers from the Budgetary Reserve Fund (which is a new fund that will be created pursuant to the 2012 FOA) are considered Authority Revenues but not Operating Revenues as defined in the 2012 MAT.

PRASA's expenses projections, on an accrual basis, and associated assumptions are discussed below.

1. Payroll and Benefits (Exhibit 1, line 18) – Payroll and Benefits is PRASA's largest expense category. Over the past three fiscal years, PRASA has averaged approximately $307M annually for this expense category; with a high of $333M in FY2008 and a low of $278M in FY2011. PRASA has projected payroll and benefits expenses of $284M for FY2012. The projection for FY2012 represents a 1% increase from the FY2011 results of $278.1M, established prior to the capitalization of project overhead costs. FY2012 YTD results through November 30, 2011 show that PRASA is currently above its Payroll and Benefits budget by approximately $4.8M. This negative deviation is due mostly to additional overtime expenses incurred in the preparation for three hurricanes that threatened Puerto Rico in August and September of 2011. PRASA is projecting annual increases of approximately 2% each year in this expense category for fiscal years 2013 through 2016. This annual increase considers the impact of the negotiated labor Collective Bargaining Agreement (CBA) with the UIA-AAA.

   PRASA and its largest union, the UIA-AAA have recently finalized negotiations of a new CBA, effective from January of 2012 through December of 2015, that contains certain retroactive and future economic agreements that have an impact on PRASA's payroll and benefits expense projections. The new CBA was signed by the parties on January 20, 2012. PRASA is projecting that the negotiated terms will have an effect on its Forecast, as early as FY2012.

   PRASA's Forecast already includes the additional payroll and benefits expenses negotiated with UIA-AAA, the effects of which are summarized in the table below. These additional costs include: an increase in medical insurance benefits for current transitory employees ($250 for 350 transitory employees), a new summer bonus ($240 annual bonus per employee starting in FY2014), a meal allowance for plant operators, and an additional salary increase for employees ($100 per month/per employee, starting in FY2014).

Table 5-14:
Projected Additional Expenses Related to UIA-AAA CBA ($, Thousands)

	FY2012	FY2013	FY2014	FY2015	FY2016
Projected Additional Payroll and Benefits Expenses UIA-AAA	$1,013	$2,430	$9,951	$16,431	$22,911

   PRASA has assumed an average cost per (full time employee) FTE for its regular employee classifications[16] of $56,000. This amount is reasonable considering the FY2011 average

[16] Regular employee classifications include: Appointed, Career, UIA-AAA, and HIEPAAA employees.

salary per FTE was close to $55,000. This cost takes into account the previously negotiated terms between PRASA and the UIA-AAA, which provided for a salary increase of approximately $0.60 per hour, for UIA-AAA employees (excludes transitory employees whose benefits are as mandated by law).

Regarding PRASA's labor relations with its other labor union, the HIEPAAA, no material changes are reported.

As previously mentioned, PRASA intended to continue its personnel reduction initiative in future years, as programmed. However, given the current economic situation and high unemployment rate of Puerto Rico, PRASA's administration determined that it was in the best interest of Puerto Rico's citizens and overall economy to delay its staff reduction plan to future years. PRASA is projecting to reduce 50 FTEs, each year, in FY2013 and FY2014 (100 FTEs total during the forecast period). Additionally, PRASA included in its FY2012 budget 225 additional transitory employees that may be hired throughout the fiscal year to perform monthly customer meter readings and/or other customer service related activities. As such, PRASA projects staff levels for the remainder of the forecast period to approximate a total of 5,045.

MPPR/Malcolm Pirnie believes PRASA's payroll and related benefits are reasonable for the forecast period given that PRASA's cost per FTE and future attrition assumptions are conservative and includes the most recent conditions negotiated between PRASA and the UIA-AAA. PRASA should closely monitor its FY2012 results and make the necessary adjustments moving forward in order to offset the YTD negative deviation which will be further exacerbated by the additional expenses related to the UIA-AAA CBA. As such, PRASA may need to adjust its assumptions, especially regarding attrition levels and annual cost per FTE, as these could represent a material impact on the Forecast.

2. Electricity (Exhibit 1, line 19) – Electric Power is PRASA's second largest expense category. PRASA has projected an electric power expense of $175M for FY2012. This amount represents a 12% increase from FY2011 results. The FY2012 projection is based on an expectation that oil market prices experienced between July 2010 and June 2011 (an average of $93 per barrel of oil) will continue throughout FY2012. FY2012 YTD results through November 30, 2011 show that PRASA's Electric Power costs are slightly over its targeted budget (by approximately 5.6%). Also, PRASA is projecting an increase of 3% (over the FY2012 base) in electricity costs in each year from FY2013 through FY2016.

   PRASA's electricity expense projections do not consider the potential savings from the energy conservation measures and diversification of power sources to be developed and implemented under the Comprehensive Energy Management Program (approximately $25M annually). Also, the projections do not incorporate any additional potential savings to be

achieved by PRASA from the acquisition of the hydroelectric facilities (approximately $30M). Refer to Section 3 for the detailed discussion of these initiatives.

Even though FY2012 YTD results show a negative deviation with respect to PRASA's budget, MPPR/Malcolm Pirnie finds the electricity costs assumptions and forecast reasonable given PRASA's on-going efforts to diversify its energy sources and reduce costs. However, even if energy consumption at PRASA's facilities is reduced as planned, if oil price increases continue at high rates throughout FY2012, PRASA's projections for energy costs could be materially understated. Hence, PRASA should closely monitor YTD results and adjust projections as necessary.

3. Maintenance and Repairs (Exhibit 1, line 20) – In previous fiscal years, this category had been included under the Other Expenses category. PRASA has projected $42.7M for maintenance and repair expenses in FY2012. This is approximately 5% less than the projected results for FY2011. PRASA is currently implementing cost control measures to reduce its maintenance and repair costs and has required all Operational Regions to reduce its maintenance and repair budget for FY2012 by at least 5%. In future years, PRASA is assuming Maintenance and Repair cost will increase at a rate of 3% per year due mostly to inflation. FY2012 YTD results through November 30, 2011 show that PRASA is currently below its Maintenance and Repair budget which, in turn, helps to offset some of the budget overruns experienced in other categories such as payroll and electricity. MPPR/Malcolm Pirnie believes PRASA's Forecast assumptions for maintenance and repair are reasonable, considering PRASA's commitment to implementing and achieving cost controls in this and other expense categories.

4. Chemicals (Exhibit 1, line 21) – PRASA's FY2012 budget projection for chemical expenses amounts to $30M. This projection is based on the FY2011 results, which were approximately $29.5M (8% higher than budgeted for the fiscal year). Considering that chemical costs are usually affected by inflation and worldwide demand as they are mostly commodities, in future years PRASA is assuming chemical costs will increase at an annual rate of 3% over the FY2012 budget projection.

   FY2012 YTD results through November 30, 2011 show that PRASA is off target with its Chemicals budget by approximately $4.2M. PRASA reports that this negative deviation is due mostly to higher than expected chemicals demand for treatment during August and September of 2011. Assuming that PRASA is able to implement the necessary consumption and cost controls during the remainder of FY2012, and considering historical results and the projected annual increases, PRASA's forecast projections are reasonable. Nonetheless, PRASA should closely monitor YTD results and adjust projections as necessary should this deviation not be corrected by end of FY2012.

5. Superaqueduct Service Contract (Exhibit 1, line 22) – Over the past 10 years, and up until FY2011, the Superaqueduct had been managed and operated by Thames-Dick Superaqueduct Partners, PSC (Thames-Dick) under a contract agreement with PRASA (the Master Agreement). Thames-Dick's compensation included two main components: a fixed fee for operation and management activities, which included Thames-Dick's gross margin (approximately $2M); and the pass-through of operation and maintenance expenses. These pass-through expenses included: power and fuel, chemical, insurance, contingencies and lagoon cleaning costs. The Master Agreement between Thames-Dick and PRASA was resolved by the parties pursuant to a Resolution Agreement dated May 18, 2011. The operations, maintenance and administration of the Superaqueduct were transferred back to PRASA as of June 19, 2011. The decision was made based on business and policy reasons, mutually agreed by the parties, and not based on their respective performance or existing claims.

   FY2011 expense results for the Superaqueduct totaled $28M. Current FY2012 projections for this expense category, which includes the pass through costs listed above, amount to $26.9M. For future years, PRASA is assuming this expense category will increase at a rate of 1% per year over the FY2012 base. This projection reflects PRASA's expected savings from the contract take over, and includes a small contingency to cover the additional costs associated with the cleaning of the sludge lagoons in future years.

   FY2012 YTD results through November 30, 2011 show that PRASA is on target with the Superaqueduct budgeted expenses. Based on historical and YTD results, PRASA's projections seem reasonable. However, important to note that this forecast could be negatively impacted by further increases in electricity and chemical costs.

6. Insurance (Exhibit 1, line 23) – Results for insurance expenses over the past four fiscal years have been more or less consistent, averaging approximately $10M per year. PRASA has projected $12.4M for insurance expenses in FY2012 and has assumed that this cost will increase at an annual rate of approximately 3% per year. FY2012 YTD results through November 30, 2011 show that PRASA is on target with this budget. Hence, MPPR/Malcolm Pirnie believes the Forecast projections to be conservative and reasonable considering historical results.

7. Other Expenses (Exhibit 1, lines 24) – Other Expenses is PRASA's third largest expense category. Other Expenses includes, for example: materials and supplies, security, treatment of residuals and rentals, and water transport. Over the past four fiscal years, PRASA has averaged approximately $156M in Other Expenses each year. PRASA has projected Other Expenses of $126M for FY2012 and is assuming an annual increase of 3% per year over the forecast period. Overall, the Other Expenses budget for FY2012 is in line with FY2011 results. FY2012 YTD results through November 30, 2011 show that PRASA is on target

with this budget and that, to date, it has been able to achieve cost savings related to professional services and other sub-contracted services which, in turn, help to offset some of the budget overruns experienced in other categories such as payroll and electricity. MPPR/Malcolm Pirnie finds these projections reasonable when compared to actual results in previous years and YTD results.

8. Special Projects Reserve (Exhibit 1, line 25) – PRASA has included a one-time operational reserve of $10.5M for Special Projects in FY2012. This reserve will be used for special projects throughout the fiscal year at the discretion and upon approval of PRASA's Executive President. These Special Projects may include, but are not limited to: additional operational initiatives to increase revenues and/or reduce costs, additional operational and maintenance projects, etc. No additional amounts are projected over the forecast period for this expense category. FY2012 YTD results show that PRASA has used $3.5M of this budget. MPPR/Malcolm Pirnie believes this new expense cost to be conservative and reasonable, as it provides PRASA a contingency fund for the implementation of optimization and improvement projects, amongst others.

9. Capitalized Expenses (Exhibit 1, line 26) – PRASA projects 5.7% of Operational Expenses will be capitalized every year of the forecast period. This capitalization rate is 0.3% lower than the rate used in FY2011, and 0.8% lower than in previous years. For prior years, a 6.5% capitalization rate was used based on the recommendations provided by an independent consultant retained by PRASA. The revised capitalization rate of 5.7% considers the projected CIP reduction, and is based on the latest revised report issued by its external consultant (issued in 2010 as an update to its 2007 Asset Capitalization Report). MPPR/Malcolm Pirnie has not reviewed this estimation in detail and, as such, is not providing an opinion. MPPR/Malcolm Pirnie assumes this estimation is reasonable given it has been accepted by PRASA's outside, independent auditors in the preparation of its financial statements.

5.6 Funding of PRASA CIP

The CIP developed by PRASA estimates an expenditure of $1,558.7M over the forecast period. Section 4 of this report contains a review of PRASA's CIP. Specifically, it provides an assessment of the following:

- PRASA's CIP, including a summary of the program by project category.
- The adequacy of the CIP to address identified system deficiencies and current requirements stipulated in open Consent Decrees held with regulatory agencies.
- The potential effects of future regulations to the PRASA system and the CIP.

Table 5-15 provides a summary of the CIP along with the anticipated sources of funding (as currently approved by PRASA's Board of Directors). In addition to these sources and uses, PRASA is in the process of including in its CIP $50M in additional uses of funds over the forecast period to finance facility improvements related to the EPC initiative described in Section 3. These additional uses will be financed with bonds proceeds.

Table 5-15:
CIP Projected Uses and Sources of Funds ($, Thousands)

	FY2012	FY2013	FY2014	FY2015	FY2016	TOTAL
USES OF FUNDS						
Repair & Replacement of Fixed Assets	$21,980	$38,385	$51,367	$53,824	$57,628	**$223,184**
CIP Infrastructure Projects	384,772	357,548	248,717	160,376	184,126	**1,335,539**
Total Projected Capital Expenses (Uses)	**$406,751**	**$395,933**	**$300,084**	**$214,200**	**$241,754**	**$1,558,722**
SOURCES OF FUNDS						
Federal Funds – Rural Development Funds	$20,000	$15,000	$15,000	$15,000	$15,000	$80,000
Federal Funds – State Revolving Funds	57,155	50,933	45,084	49,200	46,754	249,126
Federal Economic Stimulus – Grants	18,475	-	-	-	-	18,475
Federal Economic Stimulus – Loans	9,179	-	-	-	-	9,179
Local Stimulus	1,942	-	-	-	-	1,942
Bonds Proceeds / Interim Financing	300,000	330,000	240,000	150,000	180,000	1,200,000
Total Sources of Funds	**$406,751**	**$395,933**	**$300,084**	**$219,329**	**$241,754**	**$1,563,851**

Of the sources of funds identified over the five-year forecast period (including the additional bonds proceeds to be used for the financing of the EPC initiative-related improvements), 78% are projected to come from bond proceeds and/or interim financing; 20% are projected to come from Federal Funds (State Revolving Fund, Rural Development bonds, American Recovery and Reinvestment Act, and other matching sources); and 2% is projected to come from federal and local economic stimulus funds (both loans and grants). Given current market conditions and PRASA's fiscal situation, it is possible that the projected future bond issuances will not occur as projected. In such case, PRASA would have to continue to work with the GDB in order to secure the necessary interim funding to continue its CIP implementation.

5.7 Debt Service

5.7.1 Existing Debt Service

The 2008 Series A and B Senior Lien Revenue Bonds (the "Senior Lien Bonds") and Revenue Refunding Bonds 2008 Series A and B (collectively, the "2008 Guaranteed Bonds") were issued

as part of a comprehensive financial plan to fund PRASA's CIP and restructure PRASA's outstanding indebtedness to accommodate its current and future CIP needs. The proceeds of PRASA's $1,338,649,456 Senior Lien Bonds were used by PRASA to (i) fund a portion of the cost of its CIP, (ii) refinance certain lines of credits and bond anticipation notes, (iii) establish a debt service reserve fund, (iv) establish a deposit for capitalized interest, (v) fund payments for termination of a forward interest rate swap agreement, and (vi) pay for expenses related to the issuance of the Senior Lien Revenue Bonds. The proceeds of PRASA's $284,755,000 Revenue Refunding Bonds (Commonwealth Guaranteed) 2008 Series A and B were used by PRASA to (i) refund the outstanding PRASA Series 1995 Bonds (Commonwealth Guaranteed), and (ii) pay for expenses related to the issuance of the Revenue Refunding Bonds. For more information, refer to the Plan of Finance in the respective Official Statements.

5.7.2 Proposed Debt Service

The 2012 Series A and B Senior Lien Revenue Bonds (the Senior Lien Bonds) will be issued as part of a comprehensive financial plan to continue to fund PRASA's CIP. The proceeds of PRASA's $1,800,450,000 tax exempt Senior Lien Bonds will be used to (i) refinance certain LOCs and BANs, (ii) fund a portion of the cost of its CIP, (iii) provide initial funding for the Budgetary Reserve Fund, (iv) establish a deposit for capitalized interests, and (v) pay for expenses related to the issuance of the Senior Lien Revenue Bonds. Additionally, the proceeds of PRASA's $295,245,000 taxable Senior Lien Bonds will be used to refinance an existing $241M BAN and provide additional financial liquidity to PRASA.

Exhibit 1 summarizes the existing and proposed debt service for the forecast period. Estimated debt service amounts include projected payments on the 2008 and 2012 Bonds, future bond offerings, LOC payments, and payments for maintaining required debt service reserves. The Senior bonds include existing Senior obligations, Senior obligations from the proposed issuance, and future bond offerings. The Senior Subordinated bonds include future bond offerings. There are no projected Subordinated bonds included in the Forecast. Commonwealth Guaranteed Indebtedness (CGI) includes existing obligations of PRASA that are guaranteed by the Commonwealth of Puerto Rico including the 2008 Commonwealth Guaranteed Bonds, USDA Rural Development Bonds, and SRF Loans. Commonwealth Supported Obligations (CSO) include the obligations of PRASA related to the Superaqueduct financing costs[17]. PRASA's Forecast includes its payment of the CGI and CSO.

[17] In January of 2012 the Commonwealth refinanced certain outstanding debt, including the CSO. A portion of the refinanced debt will be paid directly by the Commonwealth (approximately $131M), and the remainder (approximately $162M) will be paid by PRASA; thus resulting in lower CSO annual debt service payment requirements for the forecast period than previously reported in the Consulting Engineer's Reports.

5.7.3 Debt Service Coverage

Exhibit 1 presents the PRASA-prepared Forecast and shows the calculation of the DSC, under the 2012 MAT, for the forecast period. The major assumptions used to develop the revenues and expenses used in the calculation of DSC were discussed in the preceding subsections and are reflected in Exhibit 1. Debt service requirements in PRASA's Forecast include current debt and projected future bond issuances that are expected to be necessary to finance the CIP. Using these assumptions, PRASA projects that it will meet the DSC targets as required by the 2012 MAT. If the DSC requirement is not met, the 2012 MAT outlines specific actions, remedies, and timetables for PRASA to comply with the 2012 MAT.

Table 5-16 summarizes PRASA's projected DSC over the forecast period (as shown in Exhibit 1). The projected DSC results for the forecast period have been calculated using the modified Rate Covenant requirements as included in the 2012 MAT. These include the new definition for Operating Revenues and Authority Revenues.

Based on the anticipated debt service obligations over the forecast period, PRASA would meet its DSC requirements. This is contingent upon PRASA being able to secure the necessary additional cash inflows from changes in the rate structure or from additional operational initiatives, continuing with the successful implementation of its operational initiatives, maintaining its billings and collections performance, and controlling its operational expenses as projected.

Table 5-16:
FY2012 – FY2016 Projected Debt Service Coverage

Debt Service Level	DSC Requirements	FY2012	FY2013	FY2014	FY2015	FY2016
Senior Debt	2.50	8.15	7.79	2.81	2.56	2.55
Senior Subordinate Debt	2.00	7.59	7.79	2.81	2.56	2.46
Subordinate Debt	1.50	7.59	7.79	2.81	2.56	2.46
Authority Revenues / All Expenses and Debt Service	1.00	1.00	1.00	1.01	1.01	1.01

5.7.4 Debt Service Coverage – Additional Bonds Tests (ABT)

For ABT purposes, Operating Revenues are divided by the maximum annual debt service for any fiscal year. Table 5-17 summarizes PRASA's projected ABT compliance over the forecast period (as shown in Exhibit 1). The projected ABT results for the forecast period have been calculated using the modified requirements as included in the 2012 MAT.

Table 5-17:
FY2012 – FY2016 Projected ABT Calculation

Debt Service Level	Requirement[1]	FY2012	FY2013	FY2014	FY2015	FY2016
Senior Debt	2.5/1.5	3.20	2.77	2.60	2.54	2.55
Senior Subordinate Debt	2.0/1.5	3.20	2.77	2.60	2.45	2.36
Subordinate Debt	1.5	3.20	2.77	2.60	2.45	2.36

[1] Two tests apply to future debt. The first test is Operating Revenues divided by existing and proposed debt service (at the existing lien level); the second test is Operating Revenues divided by existing and proposed debt service (regardless of lien level) plus specified Reserve Fund deposits.

5.8 Operating Reserve Fund

In accordance with the 2012 MAT, an Operating Reserve Fund must be established in the amount of $150M until March 1, 2013, and thereafter:

(i) if there is a line of credit on deposit in the reserve fund, the reserve shall mean for the term of line of credit an amount equal to at least ninety (90) days of current expenses determined on the first day of the fiscal year in which such line of credit is delivered or renewed as set forth in the annual budget for such fiscal year; or

(ii) if the reserve fund is funded from revenues, the reserve shall mean an amount equal to not less than ninety (90) days of current expenses determined annually based on the current expenses relating to the fiscal year of such calculation as set forth in the annual budget for such fiscal year.

PRASA has established a line of credit on deposit to maintain the Operating Reserve Fund to be in compliance with the 2012 MAT requirements.

5.9 Capital Improvement Fund

In accordance with the 2012 MAT, a Capital Improvement Fund must be established and funded for each fiscal year, in an amount equal to the greater of:

(i) the amount set forth in the annual budget for such fiscal year, and

(ii) the amount recommended by the Consulting Engineer.

Equal monthly deposits over the fiscal year must be deposited to the Fund to make the balance of the Fund equal to the requirement. In addition, the following must also be credited to the Fund:

(i) the proceeds of any condemnation awards,

(ii) proceeds of insurance (other than use and occupancy insurance),

(iii) the proceeds of sales of property constituting a part of the Systems, and

(iv) the proceeds of any termination or similar payment received by PRASA under any interest rate swap or similar hedge agreement.

PRASA is planning to deposit $300M in the Capital Improvement Fund from bond issuance proceeds. PRASA estimates that this amount and the resulting capitalized interests (approximately $146M) will be sufficient to partially fund PRASA's remaining FY2012's CIP, as well as the planned FY2013 CIP in its entirety. Based on the projected CIP capital expenditures, this deposit amount seems reasonable.

5.10 Conclusions and Recommendations

Overall, MPPR/Malcolm Pirnie believes that the revenues and expenses included in PRASA's Forecast for fiscal years 2012 through 2016 (included in Exhibit 1) are reasonable based on recent historical performance. Based on such Forecast, PRASA should be able to comply with the Rate Covenant and the ABT requirements stipulated in the 2012 MAT. However, the probability of achieving this Forecast is conditioned on the following three assumptions:

1. PRASA's ability to maintain its service revenues in a very challenging economic environment – Continued uncertainty and strain on the economy could cause further decline in the consumption patterns of PRASA customers and collections, resulting in reductions in projected revenues. Hence, the YTD results for FY2012 should be closely monitored and projections for subsequent fiscal years shall be adjusted accordingly.

2. PRASA's ability to continue to successfully implement all of its operational initiatives – PRASA's Forecast includes results from operational initiatives that have been described throughout this report. The Forecast also includes certain revenue enhancing and cost reduction initiatives that are currently underway. MPPR/Malcolm Pirnie's conclusions regarding the Forecast assume the framework and execution of the operational initiatives will not materially change; any changes could significantly alter the findings contained and presented in this report. Although PRASA has made a dedicated commitment to implement the initiatives described in this report, there is a possibility that the projected results and, more specifically, the timing of those results will not be achieved.

3. PRASA's ability to secure other sources of revenue beyond FY2013 (after the initial funding of the Budgetary Reserve Fund has been depleted) – Starting in FY2014, compliance with the Rate Covenant and DSC requirements included in the 2012 MAT is contingent upon PRASA obtaining additional sources of revenues from the Budgetary Reserve Fund, as a result of future replenishments from the Central Government Fund or other sources of funding, or from the implementation of changes in its rate structure. The additional revenue requirements projected for FY2013, FY2014 and FY2015 amount to approximately $330M, $385M, and $420M, respectively. In the event the Budgetary Reserve Fund is depleted and not replenished with additional funding (i.e., with additional Central Government appropriations or other sources of funding), PRASA would be required to implement revenue enhancing and/or cost reduction measures, rate structure changes, or a combination of these actions, that would generate sufficient revenues to meet its DSC requirements. These additional measures

would have to provide an equivalent percent increase in revenues of approximately 45% in FY2014, with additional increases of, approximately, 5% in FY2015, and 3% in FY2016.

Considering the overall conclusions presented above, MPPR/Malcolm Pirnie recommends the following with regards to PRASA's Forecast:

1. PRASA should continuously monitor the results of operational initiatives so that adjustments, if needed, are made on a timely basis to both the program's operational elements and budget projections. If results are not achieved as projected over the course of the fiscal year, PRASA should consider:

   - Re-assessing the implementation and performance of operational initiatives.
   - Enforcing stronger cost reduction and cost control measures in O&M expense categories by administrative orders from PRASA's Executive President; these include payroll and benefits, overtime costs, maintenance and repair, and chemical costs.

2. PRASA should also focus on achieving the implementation of all of its planned revenue enhancing and cost reducing initiatives on a timely manner. PRASA's projections greatly depend on the successful implementation of such initiatives.

3. PRASA should resume the implementation of its payroll and related costs controls and resume its personnel reduction program, as soon as possible. PRASA could benefit from a utility-wide organizational assessment in order to target areas where a surplus is identified, and address staff deficiencies where needed.

4. PRASA should consider deferring the implementation of some of its current capital investment commitments over a longer period of time so that its associated debt service requirements increase in a more gradual manner than as currently projected. For this, PRASA may consider discussing with Regulatory Agencies the possibility of deferring some projects and/or implementing temporary, less capital intensive projects to remediate certain situations.

5. Although PRASA has been able to adequately plan for, fund, and implement its CIP over the past fiscal years, it is recommended that PRASA develop capital financing policies that provide direction and guidance regarding the use of debt and cash funding the CIP in the future. PRASA should then begin funding the Capital Improvement Fund and the Rate Stabilization Account.

6. PRASA should consider increasing water and wastewater service rates to a level that will provide sufficient revenue to meet all of its obligations as defined in Article 7 of the 2012 MAT. This recommendation is supported by the fact that, in FY2011 and FY2012, PRASA received appropriations from government sources in the amounts of $105M and $70.2M (YTD), respectively, to balance its budget and to meet DSC requirements.

7. Any possible rate increase and changes in the rate structure should follow the basic Bonbright principles considered when the previous rate increases were authorized in October 2005. These principles include: revenue stability and predictability, simplicity and public acceptance, fairness to all customer groups, defensibility, and conservation.[18] Although PRASA's Board of Directors can approve up to a 4.5% automatic annual rate adjustment (up to 25% cumulative) as stipulated in the 2005 Rate Resolution, any increase above this amount must follow the due process established in Law #21 of May 1985, Law #170 of August 1988, and corresponding amendments.

8. At the time of preparation of this report, PRASA projects that approximately $240M of the 2012 bond issue will be used to provide the initial funding of the Budgetary Reserve Fund. Transfers from this fund are intended to be used to meet PRASA's O&M expenses and certain Rate Covenant requirements. MPPR/Malcolm Pirnie is of the opinion that the use of long-term debt to fund recurring annual O&M expenses is not a sustainable financial practice. PRASA should begin setting the stage for rate increases as part of a multi-year, sustainable financial plan and not continue the use of long-term debt to pay for current expenses. To the extent Central Government appropriations or other sources of funding become available, this will moderate future rate increases. However, the long-term financial plan for PRASA should be a self sustaining plan with limited or no reliance on Central Government appropriations and no reliance on long-term debt to fund O&M expenses.

[18] James C. Bonbright, Albert L. Danielson, and David R. Kammerschen, *Principles of Public Utility Rates* (Public Utilities Reports Inc.) 2nd ed. 1989.

EXHIBIT 1

	PRASA FINANCIAL PROJECTIONS PRO FORMA ($, Thousands)	FY2012 PROJECTION	FY2013 PROJECTION	FY2014 PROJECTION	FY2015 PROJECTION	FY2016 PROJECTION
	OPERATING REVENUES					
1	Service Collections					
2	Base Fee and Service Charges	$740,000	$730,000	$730,000	$730,000	$730,000
3	Operational Initiatives - Additional Billings	35,000	40,000	40,000	40,000	40,000
4	Operational Initiatives - Collections from Prior Years	25,000	20,000	20,000	4,000	5,000
5	Reserve for Uncollectible Accounts	(54,309)	(75,190)	(75,190)	(75,190)	(75,190)
6	PAN/TANF Subsidy	(4,000)	(4,000)	(4,000)	(4,000)	(4,000)
7	Subsidy to Public Housing	(12,000)	(12,000)	(12,000)	(12,000)	(12,000)
8	Miscelaneous Income	4,000	4,000	4,000	4,000	4,000
9	Special Assessments	5,000	3,000	3,000	3,000	3,000
10	Transfer from/(to) Rate Stabilization Account	-	-	-	-	-
11	**Total Operating Revenues**	**$738,691**	**$705,810**	**$705,810**	**$689,810**	**$690,810**
12	Other Sources of Revenue					
13	Transfer from Budgetary Reserve Fund	$95,000	$145,000	-	-	-
14	General Fund Contributions	70,264	-	-	-	-
15	Additional External Support/Other Measures/Rate Increases	-	-	330,000	385,000	420,000
16	**Total Other Sources of Revenue**	**$165,264**	**$145,000**	**$330,000**	**$385,000**	**$420,000**
17	**Total Authority Revenues (Line 11 + Line 15)**	**$903,955**	**$850,810**	**$1,035,810**	**$1,074,810**	**$1,110,810**
	OPERATING EXPENSES					
18	Payroll and Related	$283,493	$292,123	$296,819	$301,474	$307,954
19	Electric Power	175,000	180,250	185,658	191,227	196,964
20	Maintenance and Repair	42,652	43,932	45,250	46,607	48,005
21	Chemicals	30,000	30,900	31,827	32,782	33,765
22	Superaqueduct Service Contract	26,900	27,169	27,441	27,715	27,992
23	Insurance	12,410	12,782	13,166	13,561	13,968
24	Other Expenses	125,522	129,288	133,166	137,161	141,276
25	Special Projects Reserve	10,484	-	-	-	-
26	Capitalized Operating Expenses	(39,422)	(40,837)	(41,800)	(42,780)	(43,886)
27	**Total Operating Expenses**	**$667,039**	**$675,607**	**$691,527**	**$707,747**	**$726,038**
28	Total Senior Debt Service (S + SSUB + SUB)	$97,296	$90,600	$251,268	$269,606	$280,731
29	Revenues Available for Operating Expenses and Other Debt Service After Senior Debt Service	$806,659	$760,210	$784,542	$805,204	$830,079
30	Total Commonwealth Debt Service (CGI & CSO)	$137,363	$80,934	$84,593	$88,890	$95,495
31	**Net Authority Revenues After Operating Expenses and All Debt Service Obligations**	**$2,257**	**$3,669**	**$8,422**	**$8,567**	**$8,546**
	DEBT SERVICE					
	Senior (S)	$90,600	$90,600	$251,268	$269,606	$271,421
	Senior Subordinated (SSUB)	6,696	-	-	-	9,310
	Subordinated (SUB)	-	-	-	-	-
	Commonwealth Guranteed Indebtednes (CGI)	109,649	80,934	84,593	87,296	86,496
	Commonwealth Supported Obligations (CSO)	27,714	-	-	1,594	8,999
	Total Debt Service	**$234,659**	**$171,534**	**$335,861**	**$358,496**	**$376,226**

*Numbers may not add up due to rounding

EXHIBIT 1

	PRASA FINANCIAL PROJECTIONS PRO FORMA DEBT SERVICE COVERAGE AND ADDITIONAL BOND TESTS ($, Thousands)	FY2012 PROJECTION	FY2013 PROJECTION	FY2014 PROJECTION	FY2015 PROJECTION	FY2016 PROJECTION
1	Operating Revenues	$738,691	$705,810	$705,810	$689,810	$690,810
2	Other Sources of Revenue	165,264	145,000	330,000	385,000	420,000
3	Authority Revenues (Line 1 + Line 2)	$903,955	$850,810	$1,035,810	$1,074,810	$1,110,810
4	Operating Expenses	$667,039	$675,607	$691,527	$707,747	$726,038
	Senior Debt					
5	**Senior**					
6	Annual Debt Service	$90,600	$90,600	$251,268	$269,606	$271,421
7	DS Coverage Required = 2.50	8.15	7.79	2.81	2.56	2.55
8	Maximum Annual Debt Service	$230,792	$254,711	$271,422	$271,422	$271,422
9	ABT Coverage Required = 2.50	3.20	2.77	2.60	2.54	2.55
10	**Senior & Senior Subordinated**					
11	Annual Debt Service	$97,296	$90,600	$251,268	$269,606	$280,731
12	DS Coverage Required = 2.00	7.59	7.79	2.81	2.56	2.46
13	Maximum Annual Debt Service	$230,792	$254,711	$271,422	$281,024	$292,747
14	ABT Coverage Required = 2.0	3.20	2.77	2.60	2.45	2.36
15	**Senior, Subordinated Subordinated & Subordinated**					
16	Annual Debt Service	$97,296	$90,600	$251,268	$269,606	$280,731
17	DS Coverage Required = 1.50	7.59	7.79	2.81	2.56	2.46
18	Maximum Annual Debt Service	$230,792	$254,711	$271,422	$281,024	$292,747
19	ABT Coverage Required = 1.50	3.20	2.77	2.60	2.45	2.36
20	Net Authority Revenues	$806,659	$760,210	$784,542	$805,204	$830,079
21	Total Operating Expenses	667,039	675,607	691,527	707,747	726,038
22	Net Authority Revenues Available for Other Debt	$139,620	$84,603	$93,015	$97,457	$104,041
	Other Debt					
23	**Commonwealth Guaranteed Indebtedness**					
24	Annual Debt Service	109,649	80,934	84,593	87,296	86,496
25	DS Coverage Required = 1.00	1.27	1.05	1.10	1.12	1.20
26	**Commonwealth Supported Obligations**					
27	Annual Debt Service	27,714	-	-	1,594	8,999
28	DS Coverage Required = 1.00	1.02	1.05	1.10	1.10	1.09
29	Total Annual Debt Service	$234,659	$171,534	$335,861	$358,496	$376,226
30	**Net Authority Revenues After Operating Expenses and All Debt Service Obligations**	**$2,257**	**$3,669**	**$8,422**	**$8,567**	**$8,546**
31	**Total Authority Revenues / All Obligations (Operating Expenses + Debt Service)**	**1.00**	**1.00**	**1.01**	**1.01**	**1.01**

*Numbers may not add up due to rounding

6 Conclusions and Recommendations

6.1 Considerations and Assumptions

In preparation of this report and the conclusions contained herein, MPPR/Malcolm Pirnie has relied on certain assumptions and information provided by PRASA with respect to the conditions which may exist or events which may occur in the future. MPPR/Malcolm Pirnie believes the information and assumptions are reasonable, but has not independently verified information provided by PRASA and others. To the extent that actual future conditions differ from those assumed herein or provided to us by others, the actual results will vary from those forecast.

In the preparation of this report, MPPR/Malcolm Pirnie has made a number of principal considerations and assumptions (as provided throughout this report); some of the most notable are as follows:

1. MPPR/Malcolm Pirnie has made no determination as to the validity and enforceability of any contracts, agreement, existing law, rule, or regulation applicable to PRASA and its operations. However, for purposes of this report, MPPR/Malcolm Pirnie has assumed that all such contracts, agreements, laws, rules and regulations will be fully enforceable in accordance with their terms.
2. PRASA will generally continue the current policies of employing qualified and competent personnel; properly operating and maintaining the System in accordance with generally accepted industry practices; and of operating the System in a prudent and sound businesslike manner.
3. The proposed CIP reflects the general needs of the System, and the CIP will be largely implemented as planned and reflected in this report.

6.2 Conclusions and Recommendations

Set forth below are the principal opinions which MPPR/Malcolm Pirnie has reached regarding the review of PRASA's System, CIP and financial projections. For a complete understanding of the assumptions upon which these opinions are based, this report should be read in its entirety.

1. The condition of the facilities visited varied from new to those requiring capital upgrades. The condition of most facilities with implemented CIP projects improved from FY2009 to FY2010. However, a number of treatment facilities are operating out of compliance with discharge permit limits and drinking water standards. Despite these compliance problems, the facilities are generally producing and delivering potable water and conveying and treating wastewater to a level of competency. PRASA reports that no material changes regarding the System condition have occurred since FY2012.

2. PRASA's O&M practices are adequate. However, there is a need for standardization of O&M practices across regions and the need for facility-specific O&M plans or manuals for facilities. Also, there is an identified need of standardized processes for prioritizing and scheduling preventative, corrective and routine maintenance activities.

3. PRASA's operational initiatives are well developed and address critical aspects of PRASA's operation such as energy and non-revenue water. The Revenue Optimization Program and Staff Reduction Program have provided significant benefits to PRASA in the form of increased revenues and cost reductions, respectively. Once implemented as planned, PRASA's operational initiatives could provide substantial additional economic and operational benefits to PRASA in the future.

4. PRASA must continue to maintain its commitment for the implementation of the IPMP. In addition, PRASA must continue a focused corrective maintenance and R&R program in order to improve leaks and overflow metrics, to maintain and improve the condition of the System, and to provide a program for the long-term preservation of the System assets. PRASA has included provisions for the continuous implementation of the IPMP in its CIP and O&M financial projections.

5. With the possible exception of buried infrastructure improvements, the planned CIP along with the O&M initiatives are generally in alignment with the System needs. Some additional needs at select plant facilities have been identified by PRASA in recent months.

6. On average, PRASA has included in its CIP approximately $44.6M in each year of the Forecast for R&R. Given PRASA's high rate of leaks and overflows, and continuing aging infrastructure, PRASA should consider increasing its annual R&R program funding and accelerating its R&R program. For this, an analysis of PRASA's R&R needs and budget is recommended in order to develop a sound R&R program that will allow PRASA to improve and extend the useful life of its System.

7. The CIP adequately addresses all mandated requirements of existing consent decrees and agreements with Regulatory Agencies. The full impact of future regulations and other regulatory requirements on PRASA's System are not known at this time. In some cases, future regulations and additional regulatory requirements are expected to require minor process changes and in other cases major capital improvements, such as construction of new treatment processes and intensive repair programs. In general, the existing CIP does not include projects intended solely to address future regulations or additional regulatory requirements that may be imposed on PRASA. Although, the existing CIP includes a contingency to address future regulations and any other regulatory requirements that PRASA may need to comply with, the impact of these may require significant operational and capital investments. PRASA continues to make allowances in its new designs to improve capabilities

to meet certain future regulations. As the impact of future regulations becomes more defined, CIP modifications will be required to adequately accommodate resulting needs.

8. Overall, PRASA's Forecast for fiscal years 2012 through 2016 (included in Exhibit 1) is reasonable based on recent historical performance. PRASA's compliance with the Rate Covenant and the ABT requirements stipulated in the proposed 2012 amended MAT are also reasonable. However, the probability of achieving this Forecast is conditioned on the following assumptions:

   - PRASA's ability to maintain its service revenues in a very challenging economic environment – Continued uncertainty and strain on the economy could cause further decline in the consumption patterns of PRASA customers, resulting in still further reductions in projected revenues. Hence, the YTD results for FY2012 should be closely monitored and projections for subsequent fiscal years shall be adjusted accordingly.
   - PRASA's ability to continue to successfully implement all of its operational initiatives – PRASA's Forecast includes results from operational initiatives that have been described throughout this report and assumptions regarding the future cost of payroll, electricity, chemicals, and other expense items. The Forecast also includes certain revenue enhancing and cost reduction initiatives that are currently underway. MPPR/Malcolm Pirnie's conclusions regarding the Forecast assume the framework and execution of the operational initiatives will not materially change; any changes could significantly alter the findings contained and presented in this report. Although PRASA has made a dedicated commitment to implement the initiatives described in this report, there is a possibility that the projected results and, more specifically, the timing of those results will not be achieved.
   - PRASA's ability to secure other sources of revenue beyond FY2013 (after the initial funding of the Budgetary Reserve Fund has been depleted) – Starting in FY2014, compliance with the Rate Covenant and DSC requirements included in the 2012 MAT is contingent upon PRASA obtaining additional sources of revenues from the Budgetary Reserve Fund, as a result of future replenishments from the Central Government Fund or other sources of funding, or from the implementation of changes in its rate structure. The additional revenue requirements projected for FY2013, FY2014 and FY2015 amount to approximately $330M, $385M, and $420M, respectively. In the event the Budgetary Reserve Fund is depleted and not replenished with additional funding (i.e., with additional Central Government appropriations or other sources of funding), PRASA would be required to implement revenue enhancing and/or cost reduction measures, rate structure changes, or a combination of these actions, that would generate sufficient revenues to meet its DSC requirements. These additional measures would have to provide an equivalent percent increase in revenues of approximately 45% in FY2014, with additional increases of, approximately, 5% in FY2015, and 3% in FY2016.

Respectfully Submitted,

MP ENGINEERS OF PUERTO RICO, P.S.C.

/s/ Guillermo Marxuach, P.E.
President

MP ENGINEERS of PUERTO RICO and its subcontractor MALCOLM PIRNIE | ARCADIS

The Water Division of ARCADIS