

APPENDIX 1C

***Preliminary Assessment of
Affordability and Early Gains***

October 2004

Table of Contents

Table of Contents

Executive Summary.....	ES-1
1 Introduction.....	1C-1
2 Guam and the Water Authority.....	1C-2
3 Service Levels.....	1C-6
4 Organization and Business Systems	1C-7
5 Financial Situation.....	1C-10
6 Affordability and Master Plan Implications	1C-14
7 Conclusions.....	1C-15
Exhibit A - References.....	A-1
Exhibit B - Five Year Financial Projection	A-2
Exhibit C - Stipulated Order Project List Cash Flow	A-4

Executive Summary

Guam is exposed to the physical challenges associated with major typhoons and earthquakes. Its economy is affected greatly by factors influencing tourism, especially from Asia, and US military expenditure. It also had a history of poor government over the past decade that has only recently been corrected. This is an economy that has good medium-term potential to grow off a low base through consistent and prudent government but also one that could be badly affected by economic and political factors that are largely beyond local control. Well planned and managed water and wastewater infrastructure can greatly assist in improving the economy if it is implemented in an affordable way.

Affordability is a socio-economic issue. At the current time, average household income is approximately \$50,000 per annum and this is the starting point for looking at the affordability of future water and wastewater improvement works.

Water and wastewater charges are affected by changes in current and future costs. Guam Waterworks Authority (GWA) is currently in the process of changing from a poor performing organization to a best in class utility. However, some decisions that will lead to a more efficient organization are beyond the control of management. For example, new laws are required to allow the organization to act more efficiently independent of government oversight. There is also a process underway to privatize GWA's operations. This may have financial impacts on future costs but it is not possible to estimate these until the actual form of the contract and associated arrangements are detailed by the privatization consultants. Consequently, these impacts will not be included in this preliminary analysis of affordability although comments are provided on various issues that could affect affordability.

Infrastructure is not an end unto itself but a means of providing a service. The three service level standards covered by the United States Environmental Protection Agency (USEPA) and the Stipulated Order (drinking water quality, wastewater overflows, and effluent discharges) are currently measured and reported. There are inadequacies in the measurement and reporting systems and GWA needs to improve the way these figures are measured, reported and communicated across management, the Consolidated Commission on Utilities and to the general public.

GWA has a legal obligation to achieve continuity of water supply to its customers, but there is no rigorous measurement of this service level or public accountability except through complaints and the political process. Properly monitoring and improving the service level for the continuity of water supply is a prime area for early gains to be made in terms of meeting legal obligations and improving the public image of GWA.

GWA is forging ahead in creating a committed management team to meet the challenges of the next decade. However, GWA needs more flexibility to make its own salary determinations if it is to recruit and retain quality staff. There may be the ability to reduce operating costs in future through further rightsizing, but the cost savings will be reduced by the need to pay some senior managers and professional staff more in future.

Considerable improvements are being made and are planned for dealing with the major gaps in the computer-based information systems. However, there appears to be a potential gap in tracking maintenance management costs for plants and pumping stations that needs to be budgeted for. Implementation costs will not be major if a module of the current J.D.Edwards financial system can be utilized. There will be considerable effort required to develop and integrate improved business

processes and systems. The cost of doing this will depend upon the skills and experience of the management team probably more so than the cost of any extra software or links required.

GWA's financial situation deteriorated markedly during the 1990's and by 2000 it was running up significant operating deficits. Also, many assets were destroyed during this decade by natural disasters and the level of service deteriorated. Remaining assets were poorly operated and maintained.

New management appointed in the last few years has turned around GWA's financial situation to a point where there is now a balanced annual budget. A Five-Year Financial Projection is available for the future CIP projects required to meet EPA obligations. The Projection has both positive and negative uncertainties associated with its estimates. On balance, these uncertainties are probably less than those facing GWA in a broader sense such as the major uncertainties relating to future changes in law affecting GWA's autonomy and efficiency of operations, the procurement methods that are to be used for major upgrading projects and even possible privatization of GWA. Consequently, the Five-Year Financial Projection is considered the best set of data available at this point on which to do some broad affordability calculations.

Based on the current Five-Year Financial Projections and planned rate increases, the program of CIP projects outlined in the Stipulated Order appears affordable as the combined water and wastewater bills will be just under 2% of median household income. Affordability is a complex socio-economic issue and each State has to set up its own criteria and make its own judgements on the issue. The USEPA has set an affordability marker in several studies at 2% of the combined water and sewer bills as a percentage of median household income. The affordability marker of 2% is a small part of most household budgets but it is poorer households that are affected by affordability issues. It is estimated that about 25% of households on Guam have combined bills over 4% of their household income and further rate rises will affect them most.

There is still opportunity to increase rates to pay for more CIP projects required by the Master Plan and keep below the affordability marker of 2%. However, the amount of extra expenditure is relatively modest at about \$60 to 120 million before the 2% level is reached. Above this level, far more attention needs to be paid to the distributional aspects of water rating. For instance, the current lifeline rate is a substandard way of providing assistance to the genuinely needy and improvements need to be made to this arrangement, or assistance provided via other means, if affordability is not to become a major public issue with higher expenditures that may result from the master plan.

***Disclaimer.** This report provides a profile of the situation in the Guam Waterworks Authority as it exists in early June 2004. The profile is based on data made available and discussions with GWA officers over three working days. The report is for preliminary 'broad brush' planning and not any other purpose.*

1 Introduction

Background

A Water Resources Master Plan is being developed for the Guam Waterworks Authority (GWA) by Brown and Caldwell and its consultant team. A preliminary step in the planning process is to identify the planning requirements. One of the tasks involved in this is to assess the affordability of new CIP projects since it is no use planning for projects which cannot be funded.

The approach to the affordability task is to conduct a top-level assessment of GWA's financial position and work with GWA to identify a range of acceptable water and wastewater rates. This range will then be used as a general guide and first look to help estimate potential operations and maintenance and capital budgets for future alternatives. The results of this effort will be incorporated into the development of the water and wastewater rates. The findings of the task are to be summarised in a Technical Memorandum.

The objective of this report is to provide input into the affordability assessment and the key risks relating to the future income and cost streams that GWA faces over the next 20 to 30 years. The findings and recommendations are based on a three day on-site review of different aspects of GWA's operations combined with an analysis of financial data and reports made available.

The primary focus of this assessment is on the economic issues relating to affordability. However, in carrying out the task, potential areas for "early gains" were looked for even though a more detailed assessment will be undertaken during the next phase of the Master Plan.

Outline of Report

Affordability is an economic issue. The starting point for gaining an understanding of the affordability issue is to look at the Guam economy in a historical context. Once there is an understanding of the broader economic influences, the economics of GWA providing water supply and wastewater services into this economy can be put into context. The report starts by outlining the history, legal framework, physical infrastructure and current situation relating to GWA.

Infrastructure is not an end unto itself but a means of providing a service. The current levels of service are reviewed and deficiencies are outlined with suggestions for corrective action. This is followed by comments on the medium and longer term expectations relating to service levels.

Organizations structure their business systems to drive performance. The organizational structure of GWA is outlined including some of the challenges facing it over the next few years. Next, GWA's business systems and data capabilities are reviewed and discussed. GWA has a major investment in its business systems and they drive organization behaviour. Gaps in the business systems are broadly assessed as these may lead to extra costs in the future. The reliability of data is also commented on as these data are the basis upon which affordability and other assessments are made. Implications for other master planning activities are also discussed.

The economic impact of GWA's bills on its customers is examined based on its current financial statements and information from other parts of the United States on affordability of water and wastewater bills as a percentage of customers' income.

EPA has issued a Stipulated Order that requires GWA to undertake a whole range of activities that will impose extra costs in the medium term. Estimates have been made of the future rate rises

required to fund these extra costs and, from these estimates, an assessment can be made of future affordability.

A set of longer term expenditure requirements will be generated in the Water Resources Master Plan. The 'envelope' of affordable expenditure and possible funding is explored. Conclusions are then drawn about affordability and key issues relating to GWA's current operations and the master planning process.

2 Guam and the Water Authority

History¹

Guam was first inhabited by Chamorros as early as 1500 BC, who emigrated from islands in south-east Asia. The island was territorially divided and governed by individual chieftains. The Chamorros flourished as an advanced fishing, horticultural and hunting society, eventually developing to a population of between 80,000 and 100,000, which is about half the island's present population.

The island was discovered by Europeans during Ferdinand Magellan's expedition in 1521 and was claimed as a Spanish possession in 1565. In 1898, following the Spanish-American War, a US Navy vessel sailed into Apra Harbour, landed and seized the Spanish Governor. The Spaniards quickly surrendered. In 1899, the United States formally purchased Guam, ending more than 300 years of Spanish rule. Since then, Guam has remained under the control of the United States except for three years of Japanese occupation in World War II.

Upon signing of the Organic Act in July 1950, Guam became an unincorporated territory of the United States. The Act declared that the new territory should be known officially as Guam. The Act additionally established a civil government, created a legislature with full law-making powers, established a District Court of Guam, enacted a Bill of Rights for the people of the territory, and granted United States citizenship to the people of Guam. In 1967, the first governor elected by the people took office and Guam became a self-governing territory of the United States.

Economy

Guam's economy of the 1970s was dominated by defense expenditure and the emergence of a growing tourist market. In the late 1980s and 1990s, Guam became increasingly dependent on Japanese tourists and less on national defense federal outlays, the territory's second largest income source. In economic and financial terms, Guam became heavily dependent and exposed to the Japanese economy.²

Guam has experienced a turbulent economic time over the past decade. The economy relies on tourism and military expenditure. Tourism has been affected by the bursting of the Japanese asset price bubble in the early 1990's followed by prolonged Japanese stagflation, the Asian financial crisis of 1997-98, the 2001 terrorist attack on New York, and in 2003 the SARS epidemic and the Iraq war.

Military expenditure on Guam has also been lower over the past decade. The military related population nearly halved from 22,178 in 1992 to 11,625 in 2000.

In addition, local disasters have affected tourism and the economy. Over the decade, havoc has been caused by Typhoon Omar in 1992, a magnitude 8.2 earthquake in 1993, the crash of a Korean Airlines flight in 1997, Super Typhoon Paka in 1997, a magnitude 8.0 earthquake in 2001, and Typhoon Chata'an and Super Typhoon Pongsonga in 2002.

Data on economic activity is limited. For example, the macroeconomic accounts have not been updated since 1998. However, the Bank of Hawaii East-West Centre reported in October 2003 “that Guam’s GDP may have contracted as much as 25-35% from the level of a decade ago.”

A new Government administration took office in January 2003 and inherited a budgetary and cash shortfall of \$283 million, the largest in Guam’s history. Since then, the economy of Guam has begun to advance on the back of increased tourism and defense activity.

Household demographics

There are two sources of demographic information on Guam. A Demographic Profile³ including social, economic and housing characteristics for 2000 was released by the U.S. Census Bureau in February 2002 and is featured in the Guam Annual Economic Review 2000-2001. It shows that the population of 84,996 in 1970 had increased to 154,805 by 2000.

The 38,769 occupied households had an average household size of 3.89 persons. In terms of household types, there are 32,367 (83.5%) family households and 19,678(58.5%) households with their own children under 18 years of age.

Mean household income in 2000 was \$49,617. The distribution of household income varies in the 2000 census from 248 (6%) households with an average income of only \$6,067 to the biggest block of 32,821 (85%) households with an average income of \$49,337.

The other source of income and household information is done by the Guam Department of Labor on an annual basis in conjunction with the unemployment survey. It is a large sample survey. The Calendar Year (CY) 2001 income report is the latest available. There was no household survey done in 2003 to collect the CY 2002 income data. A March 2004 survey was done but only unemployment rates and other minor data are currently available. Household income data was collected for 2003 but is not yet published.

There are only limited data available on macro-economic trends since 2000. The population has grown and in 2002 was recorded as 159,547. The unemployment rate decreased from 15.3% in 2000 to 11.4% in 2002. Recently, the levels of activity in the two main engines of Guam’s economy – tourism and national defense – are reported by regional economist, Wali Osman from the Department of Interior, to be rising⁵. It is therefore considered reasonable to assume that the economy and household income are now slightly better than in 2000 and that an average household income in 2004 is around \$50,000.

History of Water Supply

A history of the water supply system is described in a Water Facilities Master Plan Update done by the Barrett Consulting Group in 1992¹.

During the Spanish occupation, the Agana and Asan Springs were the two major fresh water sources. The Spanish left no sizeable water development construction but did have a good working knowledge of the island’s hydrology.

There are few records of water development by the US Navy during their initial occupation of Guam. It is known, that the Navy relied heavily on the Agana and Asan Springs and also constructed several shallow wells and small surface water impoundments. In 1937, the Navy brought a drill rig to the island and bored the first well near Barrigada. Several additional wells were drilled later confirming the existence of a substantial fresh water aquifer.

During the Japanese occupation from December 1941 to July 1944, little was done to update existing or construct new water supply facilities. The American liberation of Guam required immediate construction of new water system improvements as approximately 30,000 US military personnel were then occupying the island. Whereas the initial US Military installations were generally concentrated in the Agana and Apra Harbour areas, the reoccupation left military installations scattered throughout the island. To satisfy the sudden increase in water demands, several diversion structures were built on small streams. Wells were drilled near new military installations and two infiltration galleries were constructed. Although many of these early water supply facilities can still be found, few are still in use. Many of the wells drilled either failed during the drilling or failed because of salt water intrusion.

Historical records indicate that by 1947, approximately 7 million gallons per day (MGD) were being produced from the wells in the northern aquifer and from the Tumon infiltration gallery. In addition, Agana Springs produced up to 3 MGD while the total production from the southern Guam sources many have been as high as 5 MGD. Unfortunately, the majority of the Navy's water supplies were unreliable and the Navy elected to construct Fena Reservoir and Dam which has a watershed area of 5.8 square miles and a dependable yield of 15 MGD.

In 1963, Typhoon Karen swept over the island crippling and/or destroying many of the water facilities that had been turned over to the Government of Guam by the Navy. Shortly after the effects of the typhoon were recognized, the Federal government granted substantial funding to the Government of Guam for rehabilitation of services, and in particular, water supply. Shortly thereafter, numerous wells were constructed through extensive well-drilling programs. By the summer of 1974, a total of 57 wells were withdrawing about 15 MGD from Guam's northern aquifer.

After that time, a marked change in the island's water demand was caused by the dramatic boom in the tourist industry. The sharp increase in the number of hotels and resorts created by this boom also resulted in the development of the large tracts of land into golf courses. The majority of the development can be found in the central part of the island, near Tumon Bay. Regular hotel use, in addition to hotel air conditioning and golf course irrigation, significantly increased the demand for water.

By 1992, there were approximately 124 source diversions used by four different types of users or operating agencies: Government of Guam (PUAG); US Air Force; US Navy; and private wells. Of the total number of diversions, 117 or approximately 94% were wells. In 1989, these sources produced approximately 28 MGD, with 65% being derived from wells, 4% from springs and 31% from surface sources.

Today, the water sources are 130 wells primarily utilizing coral aquifers and the Ugum River where water is extracted for treatment in the Ugum water treatment facility. Treated water is pumped and gravity fed to the distribution systems that include approximately 700 miles of water pipelines, 33 MG of storage and 24 booster pumping stations⁴. Treated water can also be bought and supplied to parts of the public water supply system from the Navy.

The history of the wastewater system was not documented in the master planning reports made available. GWA collects and treats wastewater from six major urban and village areas on Guam. The wastewater infrastructure comprises six wastewater basins, about 200 miles of sewer lines, 76 pumping stations and six wastewater treatment plants.

GWA History

The responsibility for administering all utility services for Guam was given to the Department of Public Works in 1950. In 1952, the Public Utility Agency of Guam (PUAG) was created to manage the telephone, power, water supply and wastewater utilities⁶.

Guam Waterworks Authority was established on July 31, 1996 as a semi-autonomous, self-supporting agency and it started operating as such on February 1, 1997. However, much of the Authority's infrastructure performed badly due to damage from typhoons and earthquakes of the past decade. A poorly performing government was also a hindrance to improvement.

There was a Qual Serve report⁷ prepared on GWA in 2002 that identified major deficiencies. The EPA also brought legal action against GWA over their poor performance and this led to a Stipulated Order⁸ that prescribes 47 items for action at an estimated direct cost of \$209 million.

In order to improve governance arrangements, GWA's governance structure was altered when the Consolidated Commission on Utilities (CCU) was created to manage GWA and the Guam Power Authority. The CCU comprises five elected officials who were sworn into office on January 3, 2003.

GWA has a General Manager who oversees day-to-day operations and future planning. Under Public Law 26-76, the General Manager has to have an engineering degree and a minimum of 10 years experience in managing a water utilities company. This requirement has been put in place to avoid an inexperienced water manager being appointed to the position as occurred in the 1990s.

Currently, there is a master planning process underway to map out needs over the next 25 to 100 years and also meet many of the requirements of the Stipulated Order.

The CCU also has contracted with consultants, Black & Veatch and Hunton & Williams, to examine and undertake privatization of the Authority. The adopted approach is to have a 20- to 25-year full concession agreement under which a private company would operate the utility, come up with its own funding for projects and make the Authority's employees private-sector employees. The private contractor would take the financial and regulatory risks associated with operating the Authority and replacing and upgrading its assets to meet required needs. It is estimated that it would take at least 18 months to put a contractor in place.

GWA Legal Framework

The initial American Codes were promulgated for Guam by the US Navy (it being the sole governing authority over Guam) beginning shortly after Guam was acquired from Spain in 1898. Before that, Spanish Law applied.⁹

The Organic Act of Guam was enacted by the U.S. Congress on August 1, 1950, and is the territory's equivalent to a state constitution. Guam became a territory with civilian government, including a legislature, and followed the basic California codes: the Civil, Civil Procedure, Probate and modified Penal Codes.

In 1967, Guam became self-governing and elected its first Governor. The First Guam Legislature recodified the existing laws, making them suitable for a civilian government. These codes were added to and modified in the same basic form until 1978. At that time, the original form had outgrown its content, so the Legislature created a Law Revision Commission and Compiler of Laws. As a result of the Law Revision activities, the Probate Code and Penal Code were updated and the format of all the Codes was totally redesigned.

Water supply and wastewater services legislation was originally derived from the Public Utility Agency of Guam legislation. This agency prescribed 'Rules and regulations for water and sewer Services'¹⁰.

In 1996, Guam Waterworks Authority was formed by the Legislature. GWA operates under its own specific legislation¹¹ under the Public Utilities section of the Guam Administrative Rules and Regulations.

An Act is currently being developed to amend various laws to allow GWA and other public corporations and Government agencies to function properly and efficiently as independent agencies. The draft Act will, if enacted, give them the ability to independently administer their financial accounts, make changes to their personnel and procure equipment and services quicker and in a less costly way.

3 Service Levels

Importance of Service Levels

Many of the Phase I tasks of the master planning process involve organizing data gathering activities that are critical to delivering the Master Plan on time. However, one of the most critical aspects of Phase II will be to identify appropriate levels of service for GWA's customers and the environment in which it operates. The identification of these service levels is critical as they will ultimately drive future capital and operating expense decisions and affect affordability. Consequently, a preliminary review was undertaken of the adequacy of current service levels and the accountability measures for them.

Current Service Levels

The GWA 2002 Annual Report⁶ presents three important service level criteria relating to the performance of the Authority to the EPA as its regulator.

- ***Wastewater overflows*** is the first service level criteria and the level has decreased dramatically over the past few years and only 21 were recorded in 2002. It is understood that the situation has improved further since then and major incidents are now rare.
- ***Discharge of wastewater effluent*** to the environment is the second service level criteria discussed in the Annual Report. The Authority has to test samples and comply with EPA requirements under the Clean Waters Act. Although the number of analyses conducted by GWA is reported, the more important level of compliance is not reported.
- ***Drinking water quality*** is the third service level criteria reported in the Annual Report. The level of compliance is reported through the identification of the number of 'boil water notices' that are issued annually. There were 110 notices issued in 2002 but it is understood that water quality has improved significantly since then.

These three service level criteria are driven by Federal regulatory needs and data is available on each of them even though there could be major improvements made in the way these figures are reported and communicated across management, the CCU and to the general public.

The activities and CIP projects required under the Stipulated Order are primarily focused on meeting these three service level criteria and there are regulatory accountability mechanisms in place to regularly monitor progress against the legal requirements.

A major service level that is not covered in the Annual Report is the *continuity of water supply* to customers even though the law says that ‘GWA shall make all reasonable efforts to supply a satisfactory and continuous level of service’. The law also stipulates the meaning of a satisfactory service when it says that ‘GWA shall maintain a standard water delivery pressure range of a minimum 20 pounds per square inch (PSI) to a maximum 90 PSI at the customer’s meter’ and that ‘GWA shall make all reasonable efforts to re-establish service within the shortest possible time when service interruptions occur’.¹²

Discussions with GWA staff indicate that possibly up to 10% of GWA’s customers are affected by intermittent and ongoing water supply outages and poor pressure and that this is the major cause of current customer and political discontent with GWA’s performance. It makes sense that *properly monitoring and improving the continuity of water supply is the prime area for major early gains to be made*. It is also an area that requires added scrutiny in terms of the adequacy of current capital projects and operating improvement expenditures.

Future Movements in Service Standards

The planning done on CIP projects coming under the Stipulated Order only bring the standard of service up to the point of satisfying ‘imminent danger to life and property’. Other improvements will be required over time to meet proposed and increased standards. The exception to this is the upgrade of the Ugum water treatment plant where the new works are targeted to not only be typhoon proof but also meet the proposed higher surface water standards

The Master Plan will have to examine proposed and potential changes to standards including Surface Water treatment requirements, the Groundwater Rule, Clean Water Act and NPDES rules on primary treatment. These potential changes will affect long-term costs.

4 Organization and Business Systems

Drivers of Performance

GWA is the organization responsible for providing their customers with water supply and wastewater collection and treatment services that meets required levels of service in an efficient way. The organization has to have the people, financial resources, structure and business systems to do this. The way that the organization does this will drive performance.

A broad and quick assessment was undertaken of GWA’s organizational structure and business systems together with their plans for improving them. The aim was to identify any potential gaps and major costs that are likely to be required in future and are not covered in current budgets or plans. Identifying any extra major costs is important not only to the question of affordability but also GWA will not be able to deliver satisfactory services unless it has the capabilities to do so.

The assessment is subjective and based on a comparison of GWA with what would be expected to occur in a modern and well run utility of similar size.

Organizational Structure

The Consolidated Commission on Utilities (CCU) was created to manage GWA and Guam Power Authority. The CCU comprises five elected officials who were sworn into office on January 3, 2003.

The CCU initially had a large degree of autonomy from the Government but may be pulled back as an instrumentality of the Government and reporting directly back to the Governor.

The CCU meets twice per month with a formal business agenda that covers finances and key issues. These meetings are public and every second meeting is held outside head office so that specific villages can be visited and local communities consulted.

GWA has had to recruit a new management team over the past two years and has now largely accomplished that task. The management structure has qualified engineering specialists focused on implementing the activities required by the Stipulated Order. Specialist financial and legal managers are shared with Guam Power Authority. Under a new organizational structure, capable local managers run the operations. One manager runs the Collection and Distribution systems while the other runs the Production and Treatment Facilities. Such a split is fairly normal in a water and wastewater utility of GWA's size.

The organization has downsized in recent years and, in doing so, delivered significant operational cost savings. There may be potential to realize more cost savings in the future as long-term problems are overcome.

A major issue and potential risk for the organization is the ability to recruit and retain good professional staff. The problem is caused by several factors. Guam has lost many young educated people to the mainland USA over the past decade due to salaries being far higher elsewhere. In addition, GWA has had to abide by Government rules that have placed a freeze on salary increases for many years now. GWA is currently in the process of freeing itself from such restrictions so that it can retain and recruit good professional staff.

Consequently, there may be the ability to reduce costs in future through further downsizing but the cost savings will be reduced by the need to pay some senior managers and professional staff more in future.

Business Processes

GWA management is currently developing and improving its business processes, which were in a poor state. There is clear evidence of improvement in financial and general management and there are plans for further development. The current management focus is on rebuilding the infrastructure so that it is capable of meeting service levels. Once this is achieved, business processes will need to be developed based on modern asset management practices that allow the infrastructure to be run and replaced in efficient ways.

The current budgets should allow for business processes to be developed to meet changing needs. The challenge will be to find and retain the right team of managers and specialists to do this process development work over the next decade. This is considered achievable if GWA is given more autonomy over the salaries it pays its staff.

Computer-based Information Systems

Modern utilities use computer-based information systems that provide real time information and analyses to assist decision-making. The main types of information systems are (1) operations support systems for transaction processing, process control, equipment maintenance, and dealing with office information, (2) expert systems and (3) management support systems covering management information, decision support and executive information systems.

In a utility like GWA, it is not expected that there should be elaborate expert systems but rather a capability that handles the normal set of computerized activities in a modern water and wastewater utility of similar size. These systems need to be in place or planned and budgeted for otherwise there could be a large capital need in the medium term which could affect costs and charges.

The approach was to briefly review the current and planned computer systems and determine if there were any significant gaps. Consequently, each of the major computer systems is now reviewed.

Customer Information System (CIS)

GWA sends out monthly bills to its customers using an old system designed by a local firm over 15 years ago. It provides a database on customers and tracks billings and cash receipts.

There is a proposal to use the Utility software system run by the Guam Power Authority. GWA would use the same software but there would be separate customer databases. It would replace the current CIS and provide more functionality. The implementation plan is yet to be rolled out but there should be some provision for this new system in future budgets.

Financial Information System (J.D.Edwards)

The financial package used by GWA is the J.D.Edwards package of accounting and associated software. The J.D.Edwards system is a standard integrated package used by various utility, Government and other organizations for financial management. The software package consists of multiple modules. GWA pays for and actively uses many of these modules and has plans or is considering implementing several other modules as part of the future plans for improving the business.

The functions undertaken by this financial software package include:

- General ledger
- Accounts payable
- Accounts receivable
- Purchasing
- Spare parts and warehouse inventory
- Fixed asset register
- Human resources management
- Payroll
- Budget/requisition management

A system module that could be implemented is the Work Order module, which would allow for proper job costing of what employees do in the field. There would be the need to pay for training and an extra annual maintenance cost for implementing this module.

The J.D.Edwards package is also purported to have a Maintenance Management System. The capability and integration benefits of this module would need evaluation, but it is the type of system normally used for tracking the maintenance costs of fixed assets especially electrical and mechanical plant and equipment such as that in treatment plants and pumping facilities. Ultimately, GWA will have a need for such a system.

Complaints and job tracking system (AS400)

The AS400 is actually a mainframe computer but the in-house designed system that logs customer complaints and tracks repair and other jobs is commonly called AS400 as well by field personnel.

The system is a tracking and scheduling tool and adequate for what it does. However, systems are ultimately needed that not only track progress on jobs but can be linked or provide information on job costs and keep track of customer complaints together with all other dealings. Hence there is considerable work yet to be done and budgeted for in this area.

Asset location information (ArcInfo GIS)

A Geographical Information System (GIS) is an important tool for managing the dispersed assets of a water and wastewater utility especially the pipes. It has day-to-day uses such as in locating pipes and valves as well as being vital to problem solving and developing the models needed for longer term planning.

The Master Planning activity now underway is developing a GIS based on ArcInfo software and the costs are included in future budgets.

Operational Performance and Control (SCADA)

SCADA systems are vital for efficient operational control and to provide warnings on asset failures. They also provide performance information for management and planning purposes.

GWA originally had a SCADA system but it was gradually destroyed in natural disasters. There are plans to assess and implement a modern SCADA system and this is covered in budget projections.

Other Systems

GWA engineers have an Autocad design system and systems exist for cash management, time punching (Kronos) and designing forms and cheques (Easy Print). The suite of Microsoft Office 2000 software provides good word processing, spreadsheet, database and presentation capabilities for personal computer users.

5 Financial Situation

Financial History

GWA's financial position deteriorated during the 1990's. The financial statements show operating losses of \$20.5 million for 1998 and \$9.8 million for 1999¹³. By 2000, GWA was in a precarious situation with a significant budget deficit, accumulating and unresolved debts, many failing assets and a reputation for poor delivery of services. The 2002 Annual Report⁶ states that the operating loss in 2001 was \$11.7 million and in 2002 was \$17.0 million. Since then new management has been recruited and matters have started to turn around.

Recent budgets have projected fewer losses and the 2004 budget projects an operating profit after other sources of income are accounted for. The balance sheet has also improved its veracity after a settlement was negotiated with the US Navy over a major liability that has now been reduced to \$9 million and a Stipulated Order was approved to cover US EPA law suits over non-compliance issues.

A Five-Year Financial Projection (refer Exhibit B) was developed based on a list of activities and works necessary to meet EPA requirements listed in the Stipulated Order. The Stipulated Order lists projects with a funding requirement of \$220 million (refer Exhibit C). This Five-Year Financial Projection was used to estimate future bond raising requirements and the rate increases needed to

finance them. In view of the uncertainties with a whole range of issues relating to GWA, the Five-Year Projection is considered to include the best set of consolidated figures available upon which to make initial assessments about affordability.

Many of the figures in the Financial Projection will change and some already have. For instance, the rate increase for 2004 is listed as 12%. A rise of 9% was granted and GWA is approaching the Guam Public Utilities Commission for another rise in October.

In view of this changing environment, the approach taken is to look at the big picture and the big issues. Major changes could occur to the financial projection due to the risks associated with major capital expenditures in the Stipulated Order, so that is the focus of the next section.

Financial Risks

The Stipulated Order lists over 40 items requiring action from becoming utility members of AWWA and WEF costing \$20,000 over the next five years to constructing water transmission lines costing \$97million. Comments are provided on the risks and costs of listed items costing over \$5 million in order to establish a sense of the accuracy of the overall set of future capital expenditures.

Leak Detection and Response (\$5M)

GWA has established a Leak detection Program crew as part of the compliance requirements for the EPA Stipulated Order. A crew of two trained staff undertake the activities and good equipment has been purchased to enable them to undertake the tasks.

The crew are undertaking the leak detection program in a systematic way starting with the worst areas. The crew carries out a water audit of a confined service area by physically inventorying the systems, its sources, conveyance equipment, water lines, meters, meter histories, sales and associated costs.

A report¹⁴ has already been prepared on the Turner Hill Johnston Area, Nimitz Hill and the crew has identified such issues as:

- Meters not in the billing system
- Incomplete billing data
- The Navy master meter was out of order
- Meters that could not be matched to existing residential structures
- Leaks at tanks
- Booster pumping issues

In essence, the crew is unravelling a maze of problems associated with the water system and not just identifying leaky pipes and fittings.

The Stipulated Order budget lists \$1 million being spent on this program for each of the next five years. This will cover priority areas and also lead to some increases in income as illegal connections and meters are identified. Whether the \$1 million per annum covers all of the repair and upgrading costs identified is impossible to evaluate based on the data available at this time.

A review of the 2003 unaudited accounts¹⁵ and 2004 budget¹⁶ indicate that comparatively little is being spent on the replacement of water and sewer pipes. The value of replacing GWA's pipe systems is probably between \$300 million and \$600 million. Replacement

expenditure may need to be very little at this time because the pipes are not really old or decaying. Alternatively, replacement may add many millions of dollars per year to cash needs.

After discussions with GWA staff, issues of future concern in the water distribution network are:

- About 50 miles of 1¼", 1½" and 2" galvanized iron pipe that is between 8 and 15 years old
- About 100 miles of 2" PVC pipe laid over the past 15 years that has glued joints but is causing no current problems
- About 4 miles of 4" galvanized iron pipe that is over 30 years old
- About 20 miles of 6", 15 miles of 8" and 30 miles of 12" asbestos cement pipe laid mostly by the military over 30 years ago that has a mixture of lead and rubber ring joints, which also tends to break in earthquakes
- Old unlined cast iron pipes of 4", 6", 8", 10", 12" and 14" size that is over 20 to 30 years but not severely tuberculated yet
- Many gate valves that have been eaten out through their use as regulating valves instead of on/off devices

Replacement of these items may add several million dollars to annual replacement costs at some point in the near future. These types of potential problems may be able to be partly identified when the field data for the GIS is assembled.

At this point, the evidence is anecdotal but there appears to be potentially a significant financial exposure that needs further investigation due to the size of the potential replacement program required and its affect on long-term financial costs.

Water Meter Improvement (\$13M)

The installation of new electronic water meters is a major initiative for 2004. The meters are estimated to generate an extra 10% of revenue for GWA and this may even extend to 20% depending upon the actual state of affairs found to exist.

The benefits of the new electronic water meters will be:

- More accurate meter reading
- Less costly meter reading as 12 fewer staff will be required
- Identification of illegal and incorrect connections during the conversion process
- Better ability to identify areas where there are major leaks and illegal connections if suitable bulk meters are installed as well

The lease of the meters has been delayed because of a protest to the purchase and this was scheduled to be resolved by late June. The meters are planned to be installed over three years and the budget projection reflects this schedule.

Consequently, it is considered that there is potential upside to the return on the metering investment of several million dollars per year, but that this could be reduced by the costs of more bulk meters and remedial works.

The metering and leak detection work could also greatly assist in improving the continuity and pressure of water supply. A hydraulic network model of the water system is needed to unravel all the effects. Even a 'first-run' model at this stage should be considered as it would be a vital tool in analysing different options for immediate improvements to meet statutory requirements on continuity and pressure. This will require a coordinated approach of leak detention, metering and upgrading works being undertaken on a priority area basis if service levels are to be achieved and costs minimized.

It needs to be noted that the costs of achieving these service levels in the next year or so are not factored into the financial model and may amount to millions of dollars. In terms of the short and long term financial projections, these are not major costs.

Water Transmission Line Construction (\$97M)

The largest single expenditure in the Stipulated Order is \$97 million on construction of new transmission lines from each well so as to avoid short detention times for chlorine between well sites and households and provide improved control over the groundwater production system.

There was no detailed report readily accessible on this project and so it is not possible to evaluate options or the ability to save costs while still achieving the objectives. Due to the dominance of this investment, a thorough examination of options is warranted once a computerized model of the water system is available from the Master Planning study.

Agana Sewer Plant and Ocean Outfall (\$17.3M)

A preliminary review was undertaken of this project and the estimate was considered reasonable even if the costs for the outfall may increase as the costs for the rehabilitation of the treatment plant were considered to be an upper limit estimate.

Different procurement methods may also play a part in the outcome and no evaluation was made of the impact of a build/own/operate/transfer or design/construct/commission alternative on the outcome in performance or cost terms.

Northern Districts Sewer Plant and Outfall (\$15.5M)

A preliminary review was undertaken of this project and it appeared that the plant was going to be reconstructed with similar technology to the old plant. The outfall cost may also end up being more costly.

Consequently, there may be some longer term refurbishment costs that need to be factored into any long-term financial projections for the costs of this plant.

It was not possible to establish whether the budget projection included extra electricity costs for the operation of this and other refurbished plant. Future projections should take this factor into consideration.

Other Projects

During discussions with GWA staff, the adequacy and inadequacy of investments on other projects were raised. For instance, it was considered that the expenditure on generators was too small and may need another \$0.5 million whereas there may be less than estimated expenditure required to upgrade the Ugum Water Treatment Plant. It is not possible to reconcile all of these issues and the approach taken at this initial stage in the Master Plan is to realize that the budget is the best consolidated picture available at this time.

6 Affordability and Master Plan Implications

Affordability

An assessment of affordability requires knowledge of the current average bill for a household, likely future rate rises and what is viewed as an acceptable level of charges. As this only needs to be a 'broad brush' assessment at this time, the estimates are drawn from information made available.

GWA has a handout that provides details on the Tariff Schedule¹⁷ for water and wastewater, and for different types of user categories for each type of service.

The structure of the tariff for water in 2004 is that residential water for a ¾" meter size has a basic water charge of \$6.62 per month or \$79.44 per annum. Water costs \$2.40 per 1000 gallons for the first 5000 gallons of usage (known as the lifeline amount) and \$3.15 per 1000 gallons thereafter.

Lifeline rates are designed to provide a minimal or essential volume of water at a reduced cost to those residential customers who, due to their income level, find it difficult to afford a water service¹⁸. The Guam lifeline rate is really the initial lower rate step in an inverted-block rate and is a relatively inferior way of targeting financial relief for genuinely poor households. For instance, it provides little relief for households that have many people, use a more than average quantity of water and yet have relatively little income. Generally lifeline rates are offered to customers who meet pre-established income eligibility requirements. Consequently, improvements need to be made to the current arrangements or assistance provided by the Government via other means.

The average annual water bill for a residence is determined as follows. Total residential water revenue for the three months from October to December 2003 is stated to be \$3,633,687.63¹⁹ which equates to about \$14.5 million per year. There were 35,487 residential customers recorded out of a total customer base of 39,384 for this period. Average annual residential bills for water are therefore about \$408 or \$34 per month.

Residential wastewater charges are set at a flat monthly rate of \$22 or \$264 per year for 2004. The total residential bill for water and wastewater is therefore about \$56 per month or \$672 per annum.

Over the coming five-year planning period covered in the Financial Projection, rate increases are 12% in the first year and 5% for each of the following four years. Inflation is currently about 1% per annum and so real rate rises of about 30% are planned over the next five years. Due to this rate rise, the total residential bill for water and wastewater would increase to about \$870 per annum in today's dollar values.

This combined bill represents 1.3% of the average household income in 2004 of about \$50,000 and will increase to 1.7% in five years time assuming household income increases in line with inflation. For many households, a water and sanitation charge of 1.7% is a small part of their household budget. However, lower income households can be stretched when charges increase or they receive a large bill all at once. Fortunately, GWA bills monthly and the bill of \$40 to \$50 on average is reasonable even though it accumulates to a significant amount over a year.

There is no magic limit that can be set for affordability. Each State has to set up its own criteria and make its own judgements on the issue. A 'first pass' figure that has been adopted in several studies is to put a 2% marker on affordability for combined water and wastewater bills relative to median household income^{20,21}. For example, in an analysis and presentation widely publicized by Steve Allbee from the EPA on the funding gap that is emerging in replacing water and sanitation infrastructure, he used the 2% affordability marker as a measure of affordability of future rate rises

for the 400 water and sanitation entities in Ohio¹². This analysis also set a 4% marker on individual households as an affordability measure which needed to be assessed.

The current and projected bills for Guam are below 2% of medium household income on average. Analysis of the 4% marker on affordability for individual households shows that this would impact on households with incomes of less than \$20,000 after the next five years of planned bill increases. This means that about 10,000 households (25%) would be above the 4% marker. Consequently, further consideration needs to be given to the distributional aspects of water and sewer charges across households since the increased bills will have affordability impacts on a considerable percentage of households.

The average combined bill is projected to be 1.7% and if it is to keep within the 2% benchmark marker then this only allows for a real rate rise of about 15% above current plans. In view of the level of uncertainty in the current arrangements and financial projections, this means that the current works will take Guam's bills close to the 2% marker of average affordability.

There is still scope to pay for more CIP projects that may be required by the Master Plan. There are many factors involved in making an assessment of the extra amount of capital that could be spent such as the timing of projects, rises in future interest rates and the rate of future increases in household income. However, based on the current figures and projections, it is reasonable to expect that there can be a relatively modest (say \$60 to \$120 million) amount of extra capital expenditure before the affordability marker of 2% is reached and more difficult socio-economic issues arise.

Master Plan Implications

During the course of assembling this report, various insights and issues have arisen that will have an affect on the Master plan activities.

First, there is a need for a good identification system to be devised and systematically applied to assets across a number of computerized business systems including the GIS, job logging, job costing and potential maintenance management systems. The Asset Register on the J.D.Edwards system has a list of assets and numbering system but this is not considered adequate to meet future needs.

Secondly, consideration needs to be given to preparing a basic hydraulic model of the water system now. The continuity of supply problems are complex and an efficient solution will rely on implementing a number of projects in the right order at the right timing – metering, leak detection, changed system operations, more linking pipes, improved pumps, suitable storage reservoirs, pressure zoning and purchase of water from the Navy. The system model could be gradually improved as better data becomes available and also be used to create a better operational knowledge of the system of water pipes and pumps.

Thirdly, it is going to be difficult to reduce many of the uncertainties impacting on the current financial projections until more certainty is given to the future direction of GWA. The fallback is to map out scenarios as there are a multitude of different factors that will impact differently on financial outcomes depending upon the scenario selected.

7 Conclusions

Affordability of services is a socio-economic issue. The affordability of future increases in spending on water and wastewater infrastructure is assessed in this report largely from an economic viewpoint. It is based on a desktop study of information made available in a short visit to GWA and

is a preliminary assessment for planning purposes. Social engagement and political processes also have a part to play in making judgements on affordability issues.

It is concluded that the projected works and rate rises proposed over the next five years appear affordable. There are many uncertainties surrounding the figures used in this analysis especially the condition and future performance of the pipe networks for water and wastewater. The service level requirements for water pressure and continuity are not being met currently and it is not clear that the works program has adequately included costs to remedy the problems in the short or long term.

The Master Plan will greatly assist GWA to get a better understanding of the many uncertainties and problems facing them as well as setting GWA up with better management tools for the long term. It will also allow a better assessment to be made of the affordability of future water and wastewater services.

Exhibit A - References

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20. National Consumer Law Center, *The Poor and the Elderly – Drowning in the High Cost of Water*, 1991.
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Exhibit B - Five Year Financial Projection

Dollars in Thousands					
	FY2004	FY2005	FY2006	FY2007	FY2008
Water Revenues	\$22,887	\$23,345	\$26,146	\$27,383	\$29,305
Wastewater Revenues	\$12,758	\$13,013	\$14,575	\$15,264	\$16,336
Additional Sewer Revenues (required hook-ups)	\$40	\$80	\$150	\$470	\$600
Meter Management (revenue loss reduction)	\$100	\$800	\$800	\$1,600	\$1,600
Prior Year Collections	\$2,000	\$1,000	\$500	\$250	\$-
Water Rate Increase 1 @ 12%	\$1,373	\$2,801	\$-	\$-	\$-
Rate Increase – Supplemental for Retirees	\$785	\$-	\$-	\$-	\$-
Water Rate Increase 4 @ 5%	\$-	\$584	\$1,237	\$1,922	\$2,654
Sewer Rate Increase 1 @ 12%	\$765	\$1,562	\$-	\$-	\$-
Sewer Rate Increase 4 @ 5%	\$0	\$325	\$690	\$1,071	\$1,480
Fire Hydrant Rate change \$0.12	\$402	\$804	\$804	\$804	\$804
Fire Hydrant charge	\$420	\$-	\$-	\$-	\$-
Uncollectible Allowance	(\$848)	(\$250)	(\$200)	(\$150)	(\$100)
Other Revenues	\$200	\$351	\$351	\$351	\$351
Surcharge	\$2,719	\$2,719	\$2,719	\$2,719	\$2,719
Rate increase on surcharge	\$-	\$-	\$-	\$-	\$-
Total Revenue	\$43,602	\$44,415	\$45,053	\$48,966	\$53,030
Operating Expense	\$31,700	\$32,300	\$32,600	\$33,000	\$33,300
Depreciation	\$10,000	\$11,000	\$12,000	\$13,000	\$14,000
Interest Income	\$-	\$-	(\$3,620)	(\$1,078)	(\$965)
PMC Contract	\$-	\$500	\$500	\$500	\$500
Revenue Audit Implementation	\$150	\$-	\$-	\$-	\$-
Total Operating Expense	\$41,850	\$43,800	\$41,480	\$45,422	\$46,835
<i>Net Operating Income</i>	<i>\$1,752</i>	<i>\$615</i>	<i>\$3,573</i>	<i>\$3,544</i>	<i>\$6,195</i>
Interest (short term)	\$-	\$-	\$-	\$-	\$-
Interest (long term)	\$-	\$-	\$3,360	\$3,299	\$4,134
Total Interest	\$-	\$-	\$3,360	\$3,299	\$4,134
<i>Net Income</i>	<i>\$1,752</i>	<i>\$615</i>	<i>\$6,933</i>	<i>\$6,843</i>	<i>\$10,329</i>

Debt Service Coverage Ratio Calculation					
	FY2004	FY2005	FY2006	FY2007	FY2008
Income	\$1,752	\$615	\$6,933	\$6,843	\$10,329
Interest	\$179	\$409	\$3,360	\$3,324	\$4,134
Depreciation	\$10,000	\$11,000	\$12,000	\$13,000	\$14,000
Total Available	\$11,931	\$12,024	\$22,293	\$23,167	\$28,463
Bond Debt Service	\$-	\$1,518	\$3,301	\$7,953	\$12,705
Meter Debt Service	\$-	\$800	\$800	\$800	\$800
GPA / Navy Payments	\$2,917	\$2,719	\$2,719	\$2,719	\$2,719
Total Debt	\$3,119	\$5,037	\$6,820	\$11,472	\$16,224
Debt Service Coverage Ratio	3.83	2.39	3.27	2.02	1.75
Minimum DSCR Assumption	1.50	1.50	1.50	1.50	1.50
Result	OK	OK	OK	OK	OK

Working Capital Calculation and Rate Increases					
Cash Generated					
Earnings	\$1,752	\$615	\$6,933	\$6,843	\$10,329
Plus: Depreciation	\$10,000	\$11,000	\$12,000	\$13,000	\$14,000
Less: Principal Payments	\$-	\$1,158	\$3,301	\$7,953	\$12,705
Internally Generated Funds for Construction	\$11,752	\$10,097	\$15,632	\$11,890	\$11,624
Working Capital Reserve Requirement*	\$10,900	\$11,104	\$11,263	\$12,241	\$13,258
Rate Increase	12%	5%	5%	5%	5%
Rate Increase Assumptions:					
Rate Increase #1 of \$4.4 million annually awarded in third quarter of 2004 FY					
Rate Increase #2 of \$2.2 million annually awarded the same time of the year as the first increase in approved					
*Note: EPA Court Order requires 90 day working capital reserve					

Exhibit C - Stipulated Order Project List Cash Flow

Stipulated Order for Preliminary Relief Civil No. 02-00035

Dollars in Thousands

Line #	SO Par. #	Expense Project Description	Source of Funds	Estimated Cost	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	5 Year Total
1	1	Compliance Specialist.	P Roll	\$450	\$90	\$90	\$90	\$90	\$90	\$450
2	3	General Manager	P Roll	\$650	\$130	\$130	\$130	\$130	\$130	\$650
3	4	Chief Engineer	P Roll	\$600	\$120	\$120	\$120	\$120	\$120	\$600
4	5	Chief Financial Officer	P Roll	\$375	\$75	\$75	\$75	\$75	\$75	\$375
5	8	Operator Certification	P Roll	\$25	\$5	\$5	\$5	\$5	\$5	\$25
6	46	Operator Training and Certification Support Program	P Roll	\$420	\$20	\$100	\$100	\$100	\$100	\$420
7	9	GWA Reorganization	P Roll	\$50	\$50	\$0	\$0	\$0	\$0	\$50
8	10	Water Resources Master Plan	R&R CIP	\$1,000	\$300	\$600	\$100	\$0	\$0	\$1,000
9	10	Water Resources Master Plan	DW Grant	\$500	\$250	\$250	\$0	\$0	\$0	\$500
10	10	Water Resources Master Plan	WW Grant	\$500	\$250	\$250	\$0	\$0	\$0	\$500
11	10	Water Resources Master Plan	Bonds	\$1,000	\$0	\$600	\$400	\$0	\$0	\$1,000
12	11	Interim Disinfection	DW Grant	\$434	\$434	\$0	\$0	\$0	\$0	\$434
13	11	Interim Disinfection	Fed Grant	\$485	\$485	\$0	\$0	\$0	\$0	\$485
14	12	Interim Disinfection Monitoring	P Roll	\$1,000	\$200	\$200	\$200	\$200	\$200	\$1,000
15	13	Leak Detect and Response (Line Replacement)	R&R CIP	\$5,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$5,000
16	14	Water Meter Improvement	Lease(Net)	\$13,000	\$1,640	\$1,640	\$1,640	\$1,640	\$1,640	\$8,200
17	15	Ess. Parts Inv. (items not available within 4 days)	Operations	\$1,000	\$200	\$200	\$200	\$200	\$200	\$1,000
18	16	Tool and Equip. (Responsive Ops Minimums)	Operations	\$700	\$200	\$200	\$200	\$50	\$50	\$700
19	17	Stand-By Generators	Bonds	\$1,000	\$100	\$300	\$200	\$200	\$200	\$1,000
20	18	Underground Storage tanks	P Roll	\$250	\$250	\$0	\$0	\$0	\$0	\$250
21	19	Emergency Response Plan	P Roll	\$20	\$20	\$0	\$0	\$0	\$0	\$20
22	20	Implementation of a GWA P M Program	P Roll	\$1,995	\$265	\$600	\$600	\$265	\$265	\$1,995

Line #	SO Par. #	Expense Project Description	Source Of Funds	Estimated Cost	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	5 Year Total
23	21	Operations and Maintenance Manuals	P Roll	\$40	\$20	\$20	\$0	\$0	\$0	\$40
24	23	Standard Operating Procedures	P Roll	\$100	\$20	\$20	\$20	\$20	\$20	\$100
25	24	Vulnerability Assessment	DW Grant	\$115	\$115	\$0	\$0	\$0	\$0	\$115
26	25	Memberships in AWWA and WEF	Operations	\$20	\$4	\$4	\$4	\$4	\$4	\$20
27	26	Financial Standard Operating Procedures	P Roll	\$20	\$10	\$10	\$0	\$0	\$0	\$20
28	27	Annual Budget	P Roll	\$100	\$20	\$20	\$20	\$20	\$20	\$100
29	30	Financial Plan (Includes Interim Plan [28] and PUC Review [29].	Operations	\$575	\$250	\$100	\$75	\$75	\$75	\$575
30	31	Five Year Operating Plan (moving five year plan).	P Roll	\$25	\$5	\$5	\$5	\$5	\$5	\$25
31	32.1	Reserves - Debt Service	Operations	\$11,745	\$1,515	\$3,230	\$5,000	\$1,000	\$1,000	\$11,745
32	32.2	Reserves - Emergency Operations, Maintenance, Renovation and Replacement	Operations	\$13,000	\$2,000	\$2,000	\$3,000	\$3,000	\$3,000	\$13,000
33	33	Late Payment Management Program	P Roll	\$250	\$50	\$50	\$50	\$50	\$50	\$250
34	34	Revolving Fund for Sewer Hook-Up	GEPA Grant	\$375	\$75	\$75	\$75	\$75	\$75	\$375
35	38	Water Transmission Line Construction (WTLC)	Bonds	\$97,000	\$0	\$0	\$31,000	\$33,000	\$33,000	\$97,000
36	38	WLine A Series Wells to Ordot Reservoir	DW Grant	\$2,087	\$2,087	\$0	\$0	\$0	\$0	\$2,087
37	38	WLine A Series Wells to Ordot Reservoir	Bonds	\$3,000	\$0	\$3,000	\$0	\$0	\$0	\$3,000
38	40	Agana Main Sewer Pump Station Diverter Box	R&R CIP	\$550	\$250	\$300	\$0	\$0	\$0	\$550
39	41	Ugum Surface Water Treatment Plant Restoration	DW Grant	\$1,725	\$1,725	\$0	\$0	\$0	\$0	\$1,725
40	41	Ugum Surface Water Treatment Plant Restoration	R&R CIP	\$4,275	\$0	\$2,400	\$1,875	\$0	\$0	\$4,275
41	35	Agana Ocean Outfall	Bonds	\$300	\$300	\$0	\$0	\$0	\$0	\$300
42	42	Agana Sewer Treatment Plant Renovation/Expansion	Bonds	\$17,000	\$7,000	\$9,000	\$1,000	\$0	\$0	\$17,000
43	36	Northern District Ocean Outfall	Bonds	\$500	\$500	\$0	\$0	\$0	\$0	\$500
44	39	Northern District Sewer Treatment Plant	Bonds	\$15,000	\$7,000	\$7,000	\$1,000	\$0	\$0	\$15,000
45	37	Chaot WW Pump Station and Collection System Engineering Assessment	R&R CIP	\$1,050	\$50	\$1,000	\$0	\$0	\$0	\$1,050
46	37	Chaot WW Pump Station and Collection System Engineering Assessment	Gov. Bonds	\$700	\$700	\$0	\$0	\$0	\$0	\$700

Line #	SO Par. #	Expense Project Description	Source Of Funds	Estimated Cost	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	5 Year Total
47	43	Comprehensive Performance Evaluations (CPE) for the Agat Baza Gardens, and Umatac-Merizo STPs and resulting work.	Bonds	\$4,160	\$100	\$2,060	\$2,000	\$0	\$0	\$4,160
48	43	Comprehensive Performance Evaluations (CPE) for the Agat, Baza Gardens, and Umatac-Merizo STPs and resulting work.	WW Grant	\$2,050	\$1,360	\$690	\$0	\$0	\$0	\$2,050
49	44	Santa Rita Springs Booster Station Rehabilitation	DW Grant	\$689	\$689	\$0	\$0	\$0	\$0	\$689
50	44	Santa Rita Springs Booster Station Rehabilitation	R&R CIP	\$1,000	\$0	\$800	\$200	\$0	\$0	\$1,000
51	45	Rehabilitation/Replacement of Drinking Water Wells.	R&R CIP	\$1,500	\$500	\$1,000	\$0	\$0	\$0	\$1,500
52	47	Management and Administrative Training	P Roll	\$100	\$20	\$20	\$20	\$20	\$20	\$100
53		EPA Stipulated Order Projects-Direct Cost		\$209,505	\$32,449	\$39,164	\$50,404	\$41,344	\$41,344	\$204,705
54		Leyang/So. Barragada Sewer Collector	WW Grant	\$2,600	\$2,600	\$0	\$0	\$0	\$0	\$2,600
55	SOMisc	Engineering Design	Bonds	\$6,000	\$2,000	\$2,000	\$2,000	\$0	\$0	\$6,000
56	SOMisc	Construction Management	Bonds	\$1,344	\$0	\$207	\$282	\$455	\$400	\$1,344
57	SOMisc	Regulatory/Program Management	Operations	\$145	\$20	\$25	\$30	\$35	\$35	\$145
58	SOMisc	Other Project Administration	Operations	\$1,250	\$250	\$250	\$250	\$250	\$250	\$1,250
59		EPA Stipulated Order Projects - Indirect Cost		\$8,739	\$2,270	\$2,482	\$2,562	\$740	\$685	\$8,739
60		EPA Stipulated Order Projects - Total Cost		\$218,244	\$34,719	\$41,646	\$52,966	\$42,084	\$42,029	\$213,444
61		Misc Projects on going		\$2,600						
62		TOTAL FUNDING NEEDS		\$220,844						
63		-Bond/Lease Funded		\$159,304	\$18,640	\$22,807	\$39,522	\$35,295	\$35,240	\$151,504
64		-Payroll Funded		\$6,470	\$1,350	\$1,165	\$1,135	\$800	\$800	\$5,250
65		-Operations Funded		\$28,435	\$4,169	\$5,734	\$8,479	\$4,329	\$4,329	\$27,040
66		-R & R CIP		\$14,375	\$2,100	\$3,900	\$1,100	\$1,000	\$1,000	\$9,100
67		-DW Grant Funded		\$5,550	\$5,300	\$3,000	\$0	\$0	\$0	\$8,300
68		-WW Grant Funded		\$5,150	\$4,210	\$940	\$0	\$0	\$0	\$5,150
69		-GEPA Grant Funded		\$375	\$75	\$75	\$75	\$75	\$75	\$375
70		-Fed Grant Funded		\$485	\$485	\$0	\$0	\$0	\$0	\$485

Line #	SO Par. #	Expense Project Description	Source Of Funds	Estimated Cost	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	5 Year Total
71		TOTAL SOURCES of FUNDING Needs		\$220,144						
72										
73		Debt service requirements based on bond needs		\$14,391	\$2,434	\$1,939	\$3,359	\$3,000	\$2,995	\$13,728
74										