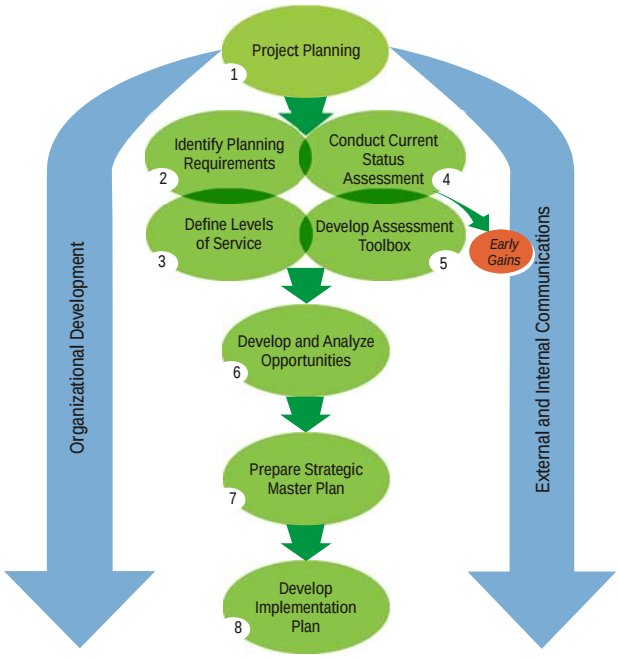
EXECUTIVE SUMMARY

The Guam Water Resources Master Plan (WRMP) has been largely driven by a need to comply with the U.S. Environmental Protection Agency (EPA) Stipulated Order for Preliminary Relief (Stipulated Order) on June 5, 2003. However, Guam Waterworks Authority (GWA) is also using this project as an opportunity to continue to improve its performance on behalf of its customers, who have placed very high importance (second only to education) on effective water and wastewater management.

In addition to the capital plan, financial plan, and analytical tools included in the WRMP, GWA has desires to use the master plan to help set the utility on a long-term, progressive path to achieve "best in class" performance. To accomplish this far-reaching objective, GWA's master plan had a number of key goals:

- Institute sound asset management and capital planning
- Develop foundation for sound management, operations, and maintenance (MOM) and financial planning
- Engage the customer and achieve the appropriate level of service
- Achieve long-term resource sustainability
- Establish a road map for full regulatory compliance

The WRMP integrates asset management best practices and utility optimization with traditional master planning. A strong emphasis has been placed on both short- and long-term success factors to unlock resources that can be reallocated to meet GWA's most critical needs. Key WRMP tasks and their interrelationships are presented in the Project Approach Diagram below.



Report Organization. The WRMP comprises three volumes. Volume 1 presents the study background, planning tools, asset management tools and assessments common to the water and wastewater utilities. Volume 2 presents the analysis and recommendations for the water system; Volume 3 presents analogous information for the wastewater system.

Executive Summary Organization. This summary provides an overview of the GWA utility systems and summarizes planning considerations, the capital improvement program, and the financial program needs.

ES.1 Utility System Overview

GWA owns and operates an extensive network of facilities that provides water and wastewater service to the majority of island residents. These facilities represent a significant investment and include substantial visible and underground infrastructure assets. The condition and performance of the utility system assets were reviewed during the master plan.

ES.1.1 Water System

GWA operates and maintains more than 200 water facilities on Guam. Table ES-1 identifies these facilities by system, type, and population served. The facility types can generally be classified as sources, reservoirs, and water booster pumping stations.

GWA is responsible for three public water systems. The Northern and Central Public Water Systems are designated Large and the Southern Public Water System is designated Small. These designations are "Distribution" system classifications established by the Guam EPA (GEPA) and are based on the size of the population served.

Table ES-1 – Guam Waterworks Authority Facilities

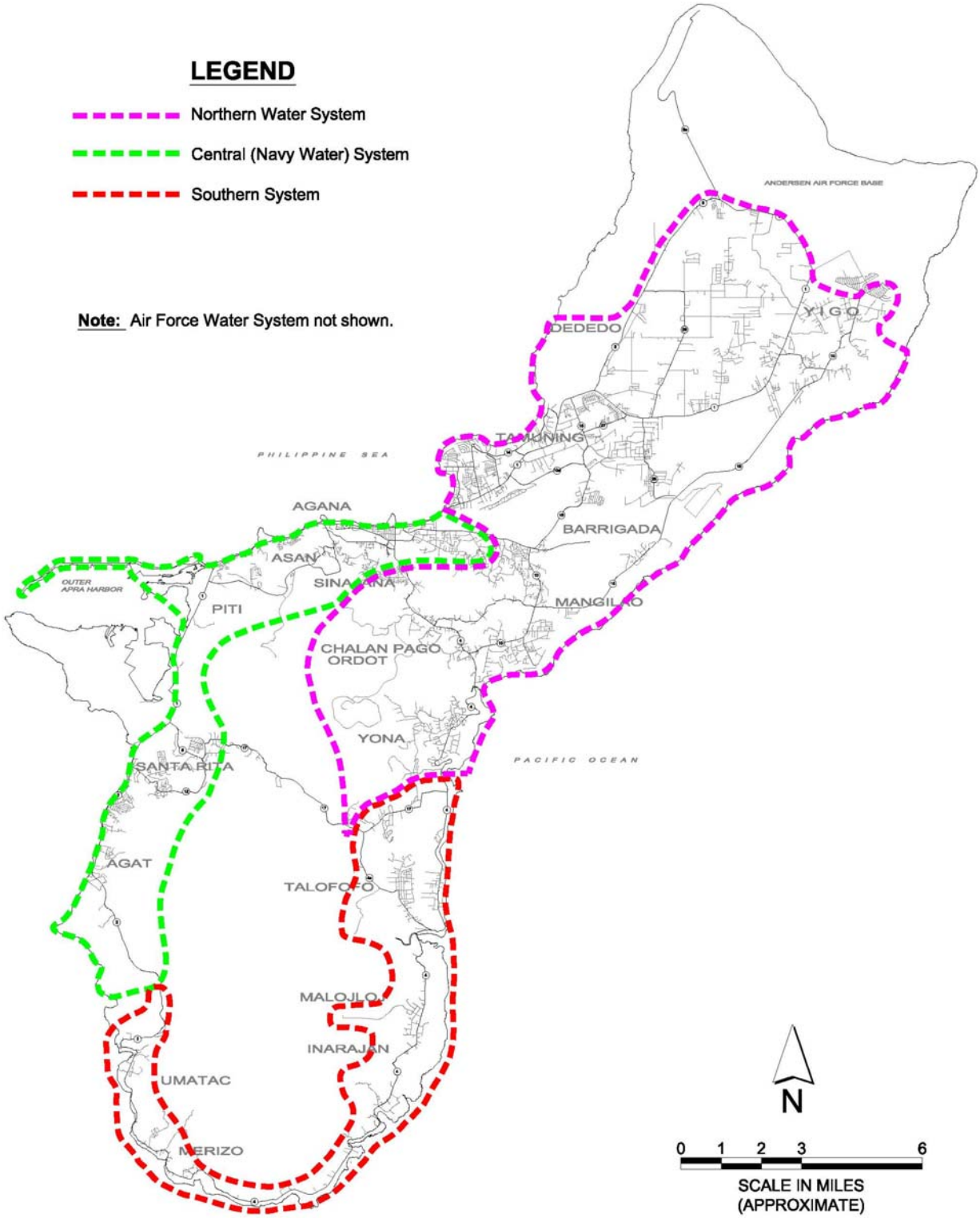
System	Wells	Springs	Reservoirs	Booster Stations	Treatment Plants
Northern	119	0	14	10	0
Central	0	1	8	9	0
Southern	2	4	14	16	1
Total	121	5	36	35	1

The public water system boundaries do not offer exact delineations, but the general boundaries are indicated in Figure ES-1. Potential overlaps of water service occur among the systems in a number of different locations. As Table ES-1 indicates, GWA's Northern System serves the majority of the population through an extensive network of wells. The Central System is principally served by the U.S. Navy's FENA Water Treatment Plant (WTP), while GWA's Ugum WTP is the primary source for the Southern System. The GWA water supply is attributed to six sources, each of which provides varying quantities of potable water. Table ES-2 presents the contributions from the different water production sources.

Table ES-2 – GWA Water Supply Sources

Source	South Quantity (mgd)	North Quantity (mgd)	Total (mgd)
Deep Wells	0.1	31.7	31.8
Navy (FENA)	0.7	3.6	4.3
Ugum Water Treatment Plant	2.2	n/a	2.2
Santa Rita Spring	0.2	n/a	0.2
Former Earth Tech Wells	n/a	3.5	3.5
Total	3.2	38.8	42.0

Figure ES-1 – Water System Boundaries



The main GWA water supply source is the deep wells, which are primarily located in the northern/central portion of the island. These deep wells contribute over 75% of the 42 million gallons per day (mgd) of water supplied. Based on customer billing records, GWA was able to account for 21 mgd. The remaining water was considered "unaccounted-for" and not billable to a customer. Unaccounted-for water is defined as water that leaves the system through illegal connections or pipeline leaks, or is associated with unreadable meters. This volume of loss represents 50% of the total system, which is a relatively high rate compared with the prevalent range of 10 to 15%. Unaccounted-for water represents one of the most significant issues facing GWA.

The GWA water distribution system includes over 400 miles of pipe constructed of a variety of pipe materials and sizes. The distribution system is a collection of legacy systems built principally by the Navy and then turned over to the Government of Guam to operate for the civilian population. GWA's water system network does not have a separate water transmission system that conveys water from supply to storage and then from storage to customers through the distribution system. Transmission and distribution are combined into a common network, presenting severe challenges to GWA. The island water system is highly integrated. Isolation and pressure reducing valves are used to ensure water supply reaches customers throughout the island.

ES.1.2 Wastewater System

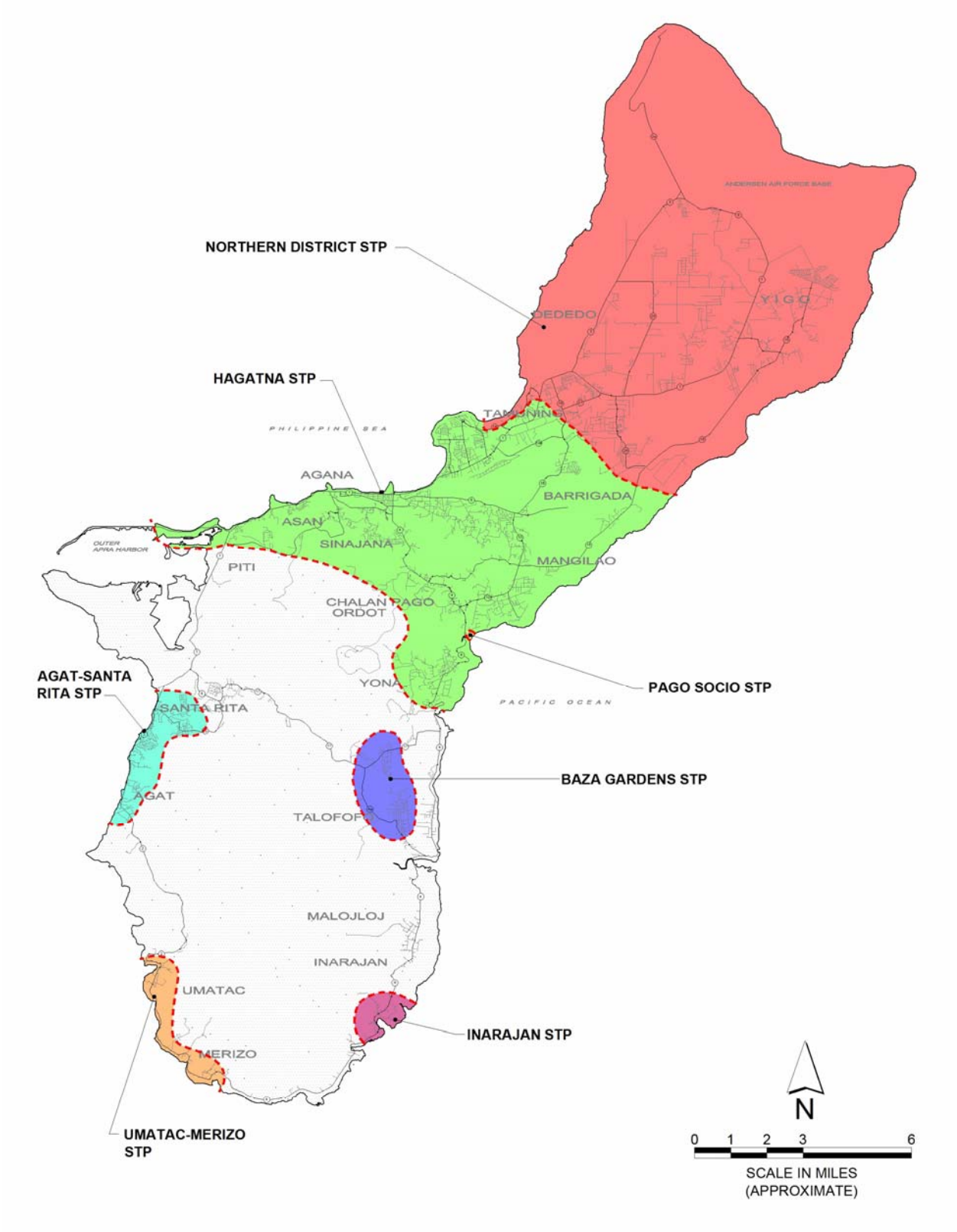
GWA provides wastewater services for Guam's general population and Andersen Air Force Base. The wastewater system consists of seven wastewater basins: Agat, Umatac-Merizo, Inarajan, Baza Gardens, Pago Socio, Northern District, and Hagatna. Figure ES-2 delineates the respective major wastewater basins. The system includes over 300 miles of collection system and force main, 77 sewage pump stations, and seven sewage treatment plants.

An overview of the GWA's seven sewage treatment plants is presented in Table ES-3. GWA's two largest treatment plants (Hagatna and Northern District) provide primary treatment and discharge effluent to ocean outfalls. The other treatment plants have original design capacities less than 1 mgd and were designed to provide secondary treatment.

Table ES-3 - GWA Sewage Treatment Plants Overview

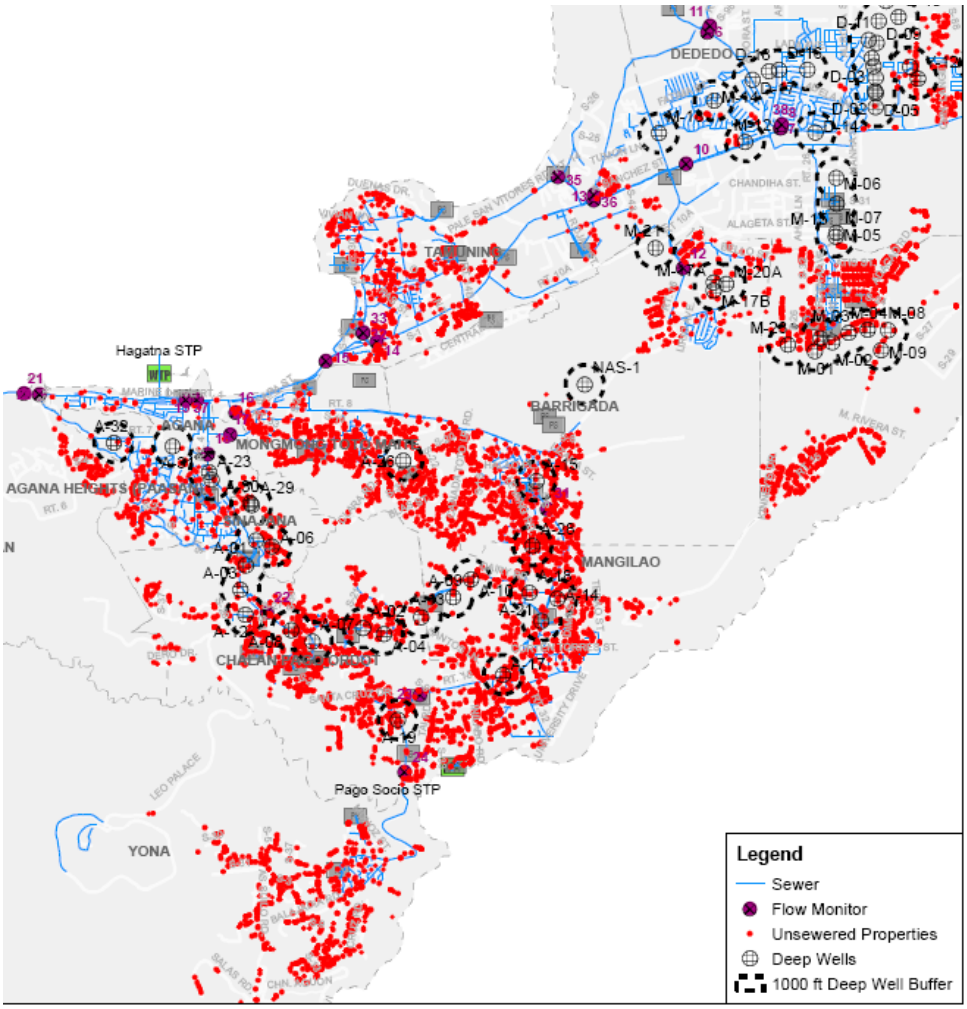
Sewage Treatment Plant	Treatment Level	Disposal Method	Original Design Capacity (mgd)	Monitored Current Average Flow (mgd)
Agat-Santa Rita STP	Secondary	Ocean outfall	0.75	1.13
Hagatna STP	Primary	Ocean outfall	12.0	7.5
Baza Gardens STP	Secondary	Stream	0.60	0.25
Umatac-Merizo STP	Secondary	Evapotranspiration/ Percolation	0.25	0.28
Northern District STP	Primary	Ocean outfall	12.0	7.8
Inarajan STP	Secondary	Percolation	0.19	0.07
Pago-Socio STP	Secondary	Percolation	0.025	N/A

Figure ES-2 – Wastewater Basins



Approximately 41% of island residents are served by individual wastewater disposal systems and not by GWA's collection and treatment systems. High concentrations of these properties are located in Northern and Central Guam above the Northern Guam Lens (Guam's principal source of drinking water). Many of these unsewered properties are close to deep wells as shown Figure ES-3 and close to existing sewers, which would allow hookups without extensive sewer construction. Lack of wastewater collection in these developed areas is endangering the integrity of Guam's sole source aquifer. Stronger regulatory control and enforcement of wellhead protection are required to help preserve the Northern Aquifer.

Figure ES-3 – Sewers and Unsewered Properties in the Hagatna Area



ES.1.3 Existing Utility System Condition

The master plan included a condition assessment of the water and wastewater system assets in February and March 2005. Much of GWA's infrastructure suffers from the effects of natural disasters, poor maintenance, and vandalism. Additionally, water and wastewater equipment has periodically been affected by the quality and consistency of delivered power.

The overall condition of equipment in the water system was poor (but has been under continual improvement since the condition assessment was performed). Significant corrosion is evident for all water infrastructures, and the reservoirs are the most vulnerable to this corrosion.

The overall condition of equipment in the wastewater system was also poor. Like the water system, significant improvements have occurred or issues are being addressed at key locations through rehabilitation contracts (e.g. Hagatna and Northern District STPs). The condition of pump stations was noticeably better than the treatment plants. Still much remains to be done.

ES.1.4 Existing Utility System Performance

The water system infrastructure is insufficient to meet basic flow and pressure requirements for all of GWA customers. Lack of redundancy and the distribution system's structure limit the ability of the utility to meet customer demands consistently. However, compliance with regulatory requirements has improved markedly over the last five years through operational changes.

The wastewater treatment systems are not typically meeting their discharge permit requirements. Significant rehabilitation is needed at the treatment plants. The collection system performance, however, has improved with the number of system spills decreasing to 13 in 2004.

ES.2 Planning Considerations

The master plan considered service levels, changes in population and land use, and regulations. Additional service-specific considerations were included in the planning for the water and wastewater systems.

ES.2.1 Service Levels

Service levels are essential performance indicators that are considered particularly important by customers and regulators. Four current GWA service level categories are required to satisfy regulatory needs and meet legal code requirements:

- Drinking water quality
- Continuity of water supply
- Wastewater system spills
- Wastewater effluent discharges

Improvements should be focused on improving performance on these essential measures.

ES.2.2 Population and Land Use Forecasts

Population forecasts were based on US Census Bureau information. The distribution of additional population was based on an analysis of best available land use data. The population served by the GWA water system is expected to grow from 157,000 in 2005 to 195,000 in 2025. The wastewater system population is forecasted to increase from 111,000 in 2005 to 134,000.

This growth was anticipated without a major Guam military expansion discussed recently. The detailed impact of this expansion could not be analyzed in the WRMP because the information about troop increases, timing, and location are undetermined. However, the WRMP does provide a brief estimate of the magnitude of infrastructure impacts from the troop relocation based on certain assumptions.

ES.2.3 Regulatory Issues

GWA must comply with significant water and wastewater regulatory requirements. Most of the key potable water regulations are administered by GEPA under the Safe Drinking Water Program. GWA's current challenge is ensuring adequate disinfection given inherent limitations of the water distribution system. The determination of the extent that the Northern Lens is considered Ground Water Under the Direct Influence of Surface Water (GWUDI) is also a significant issue.

The key wastewater regulations are administered by USEPA under the Clean Water Act. GWA's key challenge is ensuring the wastewater treatment plants are rehabilitated and improved so they meet existing NPDES discharge permits. Additionally, improvements are needed in the treatment and handling of wastewater biosolids to comply with existing regulations.

ES.2.4 Water System Considerations

GWA's principal water system needs are associated with the distribution system. The water system improvements are aimed at improving service levels, particularly continuity of water supply. When fire protection criteria for storage, flow, and pressure are met to satisfy life and safety requirements, continuity of supply is also enhanced. Reducing water loss can also extend water supply by reducing water production requirements. Because of the large water loss (over 50%), future demands could be met if the water loss was reduced. If GWA does not reduce water loss to meet increased demand, additional production will be need. Consequently, the master plan included two basic scenarios with the following objectives:

- Water Distribution 2005 Improvements – Meet maximum day and fire flow demand for 2005 population using the existing distribution system configuration
- Water Distribution 2025 Improvements – Meet maximum day and fire flow demand for the 2025 population with a new transmission main system installed to convey pumped flows directly to reservoirs. Assume water loss can be reduced only 1% annually over the 20 year period.

ES.2.5 Wastewater System Considerations

Existing and future flows for the wastewater system were projected based on population and results from an extensive flow monitoring program. Treatment plant improvements were

identified to enable treatment plants to meet existing and anticipated future treatment requirements.

ES.3 Capital Improvement Program

GWA's Capital Improvement Program (CIP) needs are substantial, representing a cost of $900 million in 2007 dollars. The needs are summarized in Table ES-4.

Table ES-4 – Capital Improvement Program Summary

Project Category	Estimated Cost, million dollars	Percent of Total
Water System		
Corrosion Program	2	0
Ugum WTP	18	2
Pipe/Equipment Replacement	71	8
2005 Distribution System Improvements	90	10
Northern System Raw Water Transmission Lines	124	14
2025 Distribution System Improvements	101	11
GWUDI Filtration Compliance	145	16
Total Water System	551	61%
Wastewater Collection System – Capacity Related	103	11%
Wastewater Collection System – Unsewered Areas	70	8%
Wastewater Collection System – Other	50	6%
Sewage Treatment Facilities	112	12%
Electrical / SCADA / GIS	13	1%
Total (rounded)	900	100%

The water system needs represent about $550 million or over 60% of the estimated funding required. The distribution system improvements comprise almost a quarter of the required funding exclusive of the Northern System Raw Water Transmission Lines, which represent 14%.

The wastewater system treatment facilities and capacity related collection system needs each require over $100 million. Unsewered area needs are also substantial at $70 million. The mechanism for funding unsewered areas needs to be evaluated because direct funding of this program may be prohibited by GWA in certain cases.

Specific CIP projects are shown in Exhibit ES-1 at the end of the Executive Summary. Each project was ranked and prioritized based on the specific needs they fulfilled including:

- Life and Safety
- Regulatory Compliance
- System Reliability
- System Redundancy
- System Capacity
- Operation Maintenance and Rehabilitation Recommendations

ES.4 Financial Program

Financing the proposed improvements will be challenging but achievable. Annual O&M expenses of $43 million in FY 2004-05, plus $4 million in debt service, will climb to $63 million by FY 2011-12 due to inflation and growth in customer service, plus $30 million in debt service for project funding. The WRMP CIP identifies $897 million in total project costs. There are two alternatives to the pace of construction, with the differences principally due to deferral in construction of certain projects not essential for life and safety. The alternatives are described as the "Base Case" CIP and the "Minimum Pace" CIP.

- **Base Case CIP.** In the first five years through FY 2010-11, the project expenditures total $185 million in 2007 dollars. To fund the CIP, rate-based revenues should be almost doubled by FY 2011-12. User rates must be increased by 8 percent annually for seven years, and additionally in subsequent years.
- **Minimum Pace CIP.** The first five years of the CIP totals $132 million. User rates must be increased by 6 to 6.4 percent annually for six years, and additionally in subsequent years.

The current rate structure is imbalanced between water and sewer utility services, with wastewater services funded in part by water service revenues. Additionally, residential customers are underpaying and commercial customers are overpaying. Nevertheless, our conclusion is that the current rate structure, with an updated lifeline program, should continue to be used for the next ten years.

Current combined utility bills are 1.6 percent of the median income. By 2010, the median household will pay more than 2 percent of income on water and sewer utilities; by 2014 the payments will rise to three percent. Over 20 years, the cost of utilities never rises over 3.7 percent of the median household income, which represents a high but probably affordable level for the median household.

Exhibit ES-1 – Capital Improvement Program – Base Case

Project	Project Types[3]	Priority Ranking	Budget Year [1,2] 2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Totals
Water System																							
Water Reservoir Internal/External Corrosion Assessment Program	LS/SR/OMR	47.6	$125,000																				$125,000
Water Reservoir Internal/External Corrosion Rehabilitation Program	LS/SR/OMR	47.6		$500,000	$500,000	$500,000	$500,000																$2,000,000
Ugum Water Treatment Plant Membrane Filtration	SC/OMR	23.3	$8,500,000																				$8,500,000
Ugum Water Treatment Plant Reservoir Replacement	LS/SR/SRED	49.9			$8,700,000																		$8,700,000
Ugum Water Treatment Plant Intake Modifications	SR	16.3	$550,000																				$550,000
Water Distribution System Pipe Replacement	LS/SR/OMR	47.6	$5,000,000	$5,000,000	$5,000,000	$5,000,000	$5,000,000	$5,000,000	$5,000,000	$5,000,000	$5,000,000	$740,000	$740,000	$740,000	$740,000	$740,000	$740,000	$740,000	$740,000	$740,000	$740,000	$740,000	$53,140,000
Mechanical/Electrical Equipment Replacement	LS/SR/OMR	47.6		$930,000	$930,000	$930,000	$930,000	$930,000	$930,000	$930,000	$930,000	$930,000	$930,000	$930,000	$930,000	$930,000	$930,000	$930,000	$930,000	$930,000	$930,000	$930,000	$17,670,000
Southern System Water Distribution System 2005 Improvements	LS/SR	38.1		$1,300,000	$1,300,000	$1,300,000	$1,300,000	$1,300,000	$1,300,000	$1,300,000	$1,300,000	$1,300,000	$1,300,000							$4,000,000		$6,000,000	$23,000,000
Central System Water Distribution System 2005 Improvements	LS/SR	38.1		$600,000	$600,000	$600,000	$600,000	$600,000	$600,000	$600,000	$600,000	$600,000	$600,000										$6,000,000
Northern System Water Distribution System 2005 Improvements	LS/SR	38.1		$2,600,000	$2,600,000	$2,600,000	$2,600,000	$2,600,000	$2,600,000	$2,600,000	$2,600,000	$2,600,000	$2,600,000										$26,000,000
Pressure Zone Realignment/Development 2005 Improvements	LS/SR	38.1		$2,700,000	$2,700,000	$2,700,000																	$8,100,000
Water Booster Pumping Station 2005 Improvements	LS/SR	38.1		$700,000	$500,000																		$1,200,000
Water System Reservoirs 2005 Improvements	LS/SR	38.1		$2,600,000	$2,600,000	$2,600,000	$8,700,000					$8,700,000											$25,200,000
Northern System Raw Water Transmission Lines	LS/SR	38.1	$4,500,000	$4,300,000		$18,000,000		$19,000,000	$20,000,000	$20,000,000		$19,000,000		$15,000,000		$4,000,000							$123,800,000
Water System Supply Wells 2025 Improvements	SC	13.8																		$5,000,000			$5,000,000
Southern System Water Distribution System 2025 Improvements	LS/SR	38.1																		$4,000,000		$6,000,000	$10,000,000
Northern System Water Distribution System 2025 Improvements	LS/SR	38.1											$5,700,000	$5,700,000	$5,700,000	$5,700,000	$5,700,000	$5,700,000	$5,700,000	$5,700,000	$5,700,000	$5,700,000	$57,000,000
Water Booster Pumping Station 2025 Improvements	LS/SR	38.1																			$1,600,000		$1,600,000
Water System Reservoirs 2025 Improvements	LS/SR	38.1												$3,000,000	$4,300,000	$3,000,000	$8,700,000	$8,700,000					$27,700,000
Northern System GWUDI Filtration Compliance[4]	RC	17							$14,500,000	$14,500,000	$14,500,000	$14,500,000	$14,500,000	$14,500,000	$14,500,000	$14,500,000	$14,500,000	$14,500,000					$145,000,000
Year Total			*$18,675,000*	*$21,230,000*	*$25,430,000*	*$34,230,000*	*$19,630,000*	*$29,430,000*	*$44,930,000*	*$44,930,000*	*$24,930,000*	*$48,370,000*	*$26,370,000*	*$39,870,000*	*$26,170,000*	*$28,870,000*	*$30,570,000*	*$30,570,000*	*$7,370,000*	*$20,370,000*	*$8,970,000*	*$19,370,000*	***$550,285,000***
Wastewater Collection System - Capacity Related																							
Northern District STP Rte 16 PS Overflow Study	SR/SC	30.1	$50,000																				$50,000
Northern District STP Eliminate Flow Split	SR/OM&R	25.8	$50,000																				$50,000
Northern District STP Priority 1 Sewer Upgrades	RC/LS	38.8				$2,400,000																	$2,400,000
Northern District STP Priority 2 Sewer Upgrades	RC/SC	30.8														$280,000							$280,000
Northern District STP Priority 3 Sewer Upgrades	RC/SC	30.8																			$4,500,000		$4,500,000
Hagatna STP Priority 1 Sewer Upgrades	RC/LS	38.8				$4,000,000																	$4,000,000
Hagatna STP Priority 2 Sewer Upgrades	RC/SC	30.8														$17,000,000							$17,000,000
Hagatna STP Priority 3 Sewer Upgrades	RC/SC	30.8																			$11,000,000		$11,000,000
Hagatna STP Pump Station Upgrades	RC/SC	30.8				$440,000	$4,400,000				$120,000	$1,200,000					$4,500,000		$45,000,000				$55,660,000
Agat-Santa Rita STP Priority 1 Sewer Upgrades	RC/SC	30.8				$1,200,000																	$1,200,000
Agat-Santa Rita STP Priority 3 Sewer Upgrades	SC	13.8																			$4,500,000		$4,500,000
Baza Gardens STP Priority 1 Sewer Upgrades	RC/SC	30.8				$650,000																	$650,000
Baza Gardens STP Priority 2 Sewer Upgrades	SC	13.8														$580,000							$580,000
Inarajan STP Pressure Sewer Upgrades	RC/SC	30.8				$1,200,000																	$1,200,000
Year Total			*$100,000*	*$0*	*$0*	*$9,890,000*	*$4,400,000*	*$0*	*$0*	*$0*	*$120,000*	*$1,200,000*	*$0*	*$0*	*$0*	*$17,860,000*	*$4,500,000*	*$0*	*$45,000,000*	*$0*	*$20,000,000*	*$0*	***$103,070,000***
Wastewater Collection System - Unsewered Areas																							
NDSTP and Hagatna STP Unsewered Properties – Sewer Hookups[5]	RC/Other	17						$1,300,000	$1,300,000	$1,300,000	$1,300,000	$1,300,000											$6,500,000
NDSTP and Hagatna STP Unsewered Properties - New Sewers [6]	RC/Other	17						$2,700,000	$2,700,000	$2,700,000	$2,700,000	$2,700,000	$2,700,000	$2,700,000	$2,700,000	$2,700,000	$2,700,000	$2,700,000	$2,700,000	$2,700,000	$2,700,000	$2,700,000	$40,500,000
NDSTP and Hagatna STP Unsewered Properties - Additional Sewer Hook-ups[5]	SC/Other	13.8									$1,250,000	$1,250,000	$1,250,000	$1,250,000	$1,250,000	$1,250,000	$1,250,000	$1,250,000	$1,250,000	$1,250,000	$1,250,000	$1,250,000	$15,000,000
South System Sewer Hook-ups[5]	RC	17																$1,500,000	$1,500,000	$1,500,000	$1,500,000	$1,500,000	$7,500,000
Year Total			*$0*	*$0*	*$0*	*$0*	*$0*	*$4,000,000*	*$4,000,000*	*$4,000,000*	*$5,250,000*	*$5,250,000*	*$3,950,000*	*$3,950,000*	*$3,950,000*	*$3,950,000*	*$3,950,000*	*$5,450,000*	*$5,450,000*	*$5,450,000*	*$5,450,000*	*$5,450,000*	***$69,500,000***
Wastewater Collection System - Other																							
Manhole Frame Seal Repair	SR/OMR	25.8	$84,000																				$84,000
Agat Manhole Rehabilitation	SR/OMR	25.8	$54,000																				$54,000
Wastewater Collection System Recurring Inspection Program[7]	SR/OMR	25.8	$610,000	$610,000	$610,000	$610,000	$610,000	$610,000	$610,000	$610,000	$610,000	$610,000	$610,000	$610,000	$610,000	$610,000	$610,000	$610,000	$610,000	$610,000	$610,000	$610,000	$12,200,000
Wastewater Collection System Replacement/Rehabilitation Program[7]	SR/OMR	25.8	$1,100,000	$1,100,000	$1,100,000	$2,000,000	$2,000,000	$2,000,000	$2,000,000	$2,000,000	$2,000,000	$2,000,000	$2,000,000	$2,000,000	$2,000,000	$2,000,000	$2,000,000	$2,000,000	$2,000,000	$2,000,000	$2,000,000	$2,000,000	$37,300,000
Year Total			*$1,848,000*	*$1,710,000*	*$1,710,000*	*$2,610,000*	*$2,610,000*	*$2,610,000*	*$2,610,000*	*$2,610,000*	*$2,610,000*	*$2,610,000*	*$2,610,000*	*$2,610,000*	*$2,610,000*	*$2,610,000*	*$2,610,000*	*$2,610,000*	*$2,610,000*	*$2,610,000*	*$2,610,000*	*$2,610,000*	***$49,638,000***
Wastewater Facilities																							
Facilities Plan/Design for the Agat-Santa Rita STP Replacement	RC/SR/SRED/SC	58.9		$600,000		$2,600,000																	$3,200,000
Agat-Santa Rita STP Replacement	RC/SR/SRED/SC	58.9						$30,000,000															$30,000,000
Facilities Plan/Design for the Baza Gardens STP Replacement	RC/SR/SRED	45.1	$500,000		$1,500,000																		$2,000,000
Baza Gardens STP Replacement	RC/SR/SRED	45.1					$18,000,000																$18,000,000
Facilities Plan/Design for the Hagatna STP Improvements & Effluent WWPS	SR/SRED/SC	41.9							$1,900,000														$1,900,000
Hagatna STP Improvements & Effluent WWPS	SR/SRED/SC	41.9									$18,000,000												$18,000,000
Facilities Plan/Design for Inarajan STP Expansion	SR/OM&R	25.8										$190,000											$190,000
Inarajan STP Expansion	SR/OM&R	25.8												$420,000									$420,000
Facilities Plan/Design for the Northern District STP – Biosolids	RC/SR	30.1	$500,000									$1,800,000											$2,300,000
Northern District STP Expansion - Biosolids	RC/SR	30.1			$5,000,000								$16,000,000										$21,000,000
Facilities Plan/Design for the Northern District STP Expansion	SR/SRED	25.6							$1,200,000														$1,200,000
Northern District STP Expansion	SR/SRED	25.6									$10,000,000												$10,000,000
Facilities Plan/Design for the Umatac-Merizo STP Improvements	SR/OM&R	25.8						$140,000															$140,000
Umatac-Merizo STP Improvements	SR/OM&R	25.8							$420,000														$420,000
Pago Socio STP Conversion	SR/OM&R	25.8										$3,700,000											$3,700,000
Year Total			*$1,000,000*	*$600,000*	*$6,500,000*	*$2,600,000*	*$18,000,000*	*$30,140,000*	*$3,520,000*	*$0*	*$28,000,000*	*$5,690,000*	*$16,000,000*	*$420,000*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	***$112,470,000***
Electrical/SCADA																							
Electrical Upgrade - Water Booster Stations (Pago Bay, etc)	LS/SR	38.1	$650,000																				$650,000
Electrical Upgrade - Water Booster Stations (Gayinero, etc)	LS/SR	38.1		$350,000																			$350,000
Electrical Upgrade - Water Booster Stations (Other WBPS)	LS/SR	38.1			$250,000																		$250,000
Electrical Upgrade - Water Wells	LS/SR	38.1	$2,000,000																				$2,000,000
Electrical Upgrade – Agat-Santa Rita STP	LS/SR	38.1	$400,000																				$400,000
Electrical Upgrade – Baza Garden STP	LS/SR	38.1					$300,000																$300,000
Electrical Upgrade – Northern District STP	LS/SR	38.1		$1,900,000																			$1,900,000
Electrical Upgrade – Umatac-Merizo STP	LS/SR	38.1			$300,000																		$300,000
Wastewater Pumping Station Electrical Upgrade	RC/SR	33.3	$1,000,000																				$1,000,000
GWA SCADA System - Phase 1	RC/SR	16.3	$250,000																				$250,000
GWA SCADA System - Phase 2	RC/SR	16.3		$1,100,000																			$1,100,000
GWA SCADA System - Phase 3	RC/SR	16.3			$2,500,000																		$2,500,000
GWA SCADA System - Phase 4	RC/SR	16.3				$850,000																	$850,000
Year Total			*$4,300,000*	*$3,350,000*	*$3,050,000*	*$850,000*	*$300,000*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	***$11,850,000***
Other																							
GIS	Other	--	$160,000	$160,000	$160,000	$160,000	$160,000																$800,000
Year Total			*$160,000*	*$160,000*	*$160,000*	*$160,000*	*$160,000*																***$800,000***
Annual Total			**$26,083,000**	**$27,050,000**	**$36,850,000**	**$50,340,000**	**$45,100,000**	**$66,180,000**	**$55,060,000**	**$51,540,000**	**$60,910,000**	**$63,120,000**	**$48,930,000**	**$46,850,000**	**$32,730,000**	**$53,290,000**	**$41,630,000**	**$38,630,000**	**$60,430,000**	**$28,430,000**	**$37,030,000**	**$27,430,000**	**$897,613,000**
							$185,423,000					$296,810,000					$223,430,000					$191,950,000	

[1] Cost based on (10% design, 5% Services during construction, 7% Construction Management, 50% Planning Level Adjustment)
[2] Costs are 2007 Dollars
[3] Project Types: **RC**=Regulatory Compliance; **SR**=System Reliability; **SRED**=System Redundancy; **SC**=System Capacity; **OMR**=OM&R; **LS**=Life & Safety
[4] Costs for design, planning, and construction of full treatment for GWUDI compliance; If filtration avoidance is allowed, total costs will be approximately $5,000,000 after transmission lines are complete
[5] Funded by Sewer Hook-up Revolving Fund
[6] GWA may not be able to provide new sewers to existing customers without a connection fee. New legislation or alternative funding sources may be required.
[7] Cost is an annual recurring cost to inspect and replace/rehabilitate the gravity and force main systems