



**Appendix 1D**

**QUALSERVE**

**QualServe™ Peer Review Report  
Prepared for**

**Guam Waterworks Authority**

May 20, 2005



## **Disclaimer**

This report has been compiled by a team of utility peers under the QualServe Program, which is jointly sponsored by AWWA and WEF. The peer team worked from materials and other information provided by the utility being reviewed. Interviews and visits to facilities and workplaces supplemented this written information. The team followed processes outlined in QualServe program guidance to conduct the review in accordance with the Participating Utility Agreement. The information presented in this report summarizes the findings of the team, and focuses on the topics that the team believes are most appropriate outputs from the review. This information is intended as one assessment that the utility can use to prepare an agenda for improvement. AWWA and WEF make no warrantee relative to the suitability of this report for any other purpose.

## **Acknowledgments**

QualServe is a trademark of the American Water Works Association. AWWA wishes to recognize the valuable contributions made by many volunteers of the Association, including those who served on the Quality Utility Service Ad Hoc Committee and created the framework for QualServe. We are grateful to the American Water Works Association Research Foundation, its volunteer project advisory committee, its staff, and its contractor, Roy F. Weston, Inc., for leadership and support during early development of the QualServe program. More recently, the Water Environment Research Foundation, its volunteer project subcommittee, staff, and contractor, Hagler Bailly, Inc., have led an effort to help expand the QualServe program and make it useful at wastewater and joint water / wastewater utilities by developing and pilot-testing new program materials. The Water Environment Federation (WEF) has joined with AWWA to co-sponsor QualServe. AWWA and WEF have also formed a Joint QualServe Advisory Committee to oversee on-going operations and improvements to QualServe. Many thanks are extended to the utilities and individuals that offered advice during development of the program, support during pilot testing of the self-assessment and peer review processes, and service as peer reviewers. QualServe continues to benefit from these varied contributions, and is now offers a comprehensive program of excellence for water and wastewater utilities throughout North America.

# Transmittal Letter

We would like to express our sincere appreciation to the people at Guam Waterworks Authority who helped us understand the workings and accomplishments of their utility. Your cooperation with helping us to prepare for this review and the kindness and energy you have displayed while we visited your facilities has made our task enjoyable. We have learned a great deal that will benefit us in our work, and trust that our discussions and this report will help you achieve your goals and contribute to your continued success. The customers of Guam Waterworks Authority are fortunate to have a knowledgeable and dedicated staff operating their facilities and searching for affordable opportunities to provide superior service.

Thank you for providing us with the documentation we used to prepare for our visit. That background information, coupled with your self-assessment report and the insights we gained through interviews and facilities visits has helped us to shape a broad understanding of your utility and the methodologies you apply in your daily work. We hope that in considering and applying this information, we have not misunderstood, omitted, or misrepresented anything of significance. Our goal has been to understand how you accomplish your work, how decisions are made, and whether practices at Guam Waterworks Authority are consistent with those at other high achieving North American utilities.

We have organized our review around the standard QualServe business process categories. These are the same as those used in the framework for the QualServe self-assessment survey.

We believe it is important that you have this report in hand before we travel home. Once we return to our own utilities, it will be difficult for our team to assemble and continue deliberations with the freshness of information and degree of focus that we have applied in preparation for our visit and over the few days we have spent with you on site. Our comments are necessarily succinct. They highlight observable strengths and areas where we believe you might benefit from additional study and action. If there are specifics that are unclear, or topics that you would like to discuss with a member of the team, we welcome your call.

Sincerely,

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# INTRODUCTION

The American Water Works Association (AWWA) and the Water Environment Federation (WEF) offer the QualServe program to assist utility managers with assessing the current state of affairs at their water, wastewater, or joint water / wastewater utilities. The peer review evaluates the same business process categories as those included in the self-assessment process, but since this is a targeted review, some of those business processes were not covered in detail in this effort. The perspectives of the two processes differ but they are complementary. The self-assessment organizes views of the utility's staff. The peer review offers the neutral perspective of volunteer utility executives and managers from other, similar, North American utilities. These two processes combine to make QualServe a unique program among those dedicated to excellence in utility service.

This report contains the findings of the team that prepared for its visit to Guam Waterworks Authority during March through May, 2005, and then visited the utility from May 17-20, 2005. Comments are purposefully succinct. They are presented using a model that identifies a number of strengths and opportunities for improvement. Most of the comments assess the current situation, and only a few offer specific suggestions for change. This is by design and appropriately leaves the final decisions with utility management. The report is best used to supplement other sources of information, such as the QualServe self-assessment, current planning documents and consultant reports, as the utility's specific agenda for improvement is constructed.

Eighteen of the QualServe business process categories at this joint (water and wastewater) utility were specifically addressed during this targeted review, although some comments are provided for other business processes outside of the primary focus of the review. Since this Peer Review follows a review conducted in 2002, the team has reviewed the recommendations of that review, and has indicated with **bold type** those comments that duplicate those made during the earlier review. In addition, the team has considered all they have learned from a broader perspective, and identified a few of the most important utility strengths and key opportunities for improvement. The team believes that these latter topics should receive attention early as the utility plans its agenda for improvement.

Every QualServe peer is a volunteer utility executive, manager, or key staff person. Each team is comprised of a number of peers with different educational and professional backgrounds that allow them to quickly form impressions of relative effectiveness of utility processes. QualServe does not prescribe a set of rigid benchmarks or checklists from which the peers define success. Rather, it considers success in a relative sense. In progressing toward excellence, every utility will have both strengths and opportunities for improvement each step along the way.

Each peer has attended a comprehensive three-day training program designed to assure that every review is consistent in process and rigorous in content. The training covers a variety of topics to help each peer understand QualServe and its relationship to complementary quality programs. Each peer team has the collective skills to carry out an effective review, and each peer fully understands his or her role with identifying topics and preparing a report that is accurate, insightful and useful.

The QualServe "college of peers" also offers an important forum for utility managers to share their experiences outside the formal peer review process. Relationships established during reviews can lead to later opportunities for collaboration and benchmarking. Currently nearly 200 major utilities have been involved with designing and implementing QualServe. And, since each participating utility is invited to support one or two of its staff as peers, these numbers and the opportunities to network with others continue to grow.

AWWA and WEF appreciate your participation in QualServe. We hope you have found the self-assessment and this peer review useful, that you will tell others about those things you liked, and tell us about those needing improvement. We welcome your comments in any form. Direct them to Jim Ginley, Manager of Utility Quality Programs, AWWA, 6666 West Quincy Avenue, Denver, Colorado, 80235.

## Utility Expectations for this Peer Review

During the in-briefing, utility staff were asked to identify their expectations from this review. The peer team considered these as they performed the review and believes that those shown in boldface type were addressed in some way during the peer review process.

- **Provide assistance in obtaining a good bond rating**
- **Learn best practices applicable to GWA**
- **Compare the status of GWA now vs. the 2002 QualServe Assessment**
- Assist in assessing the value of GIS to GWA
- Efficient quality assistance support
- **Efficient and effective financing**
- **Evaluate the training program**
- **Help make the Water Resources Master Plan become a living document**
- **Develop more professional, high quality work force**
- **Evaluate technological improvements**
- **Evaluate need for engineering support**
- How to avoid stolen or vandalized equipment
- **Organizing supplies and equipment in warehouse**
- QualServe customer satisfaction
- **Operations support and morale**
- Implement facility maintenance – more projects
- **Laboratory Information Management System**
- **Short-cut to next level of improvements**
- Bring GWA into current use of AWWA Standards
- **Help make GWA a Profitable Company**
- **Enhanced technical training**
- Safety meetings
- **Waterworks technology programs at GCC**
- **Apprenticeship program**
- Integrate data processing from complaints to work history
- **Material and equipment available 24/7**
- Quicker “Rover” Response
- **Better communication and feedback from management**
- **More efficient customer billing systems**
- Additional rovers and knowledgeable dispatchers
- **Pay raises comparable to off-island**
- **Point out potential pit-falls**
- **Don’t pull punches**
- **Enforcement (utility) permit compliance**
- **Improve Public Information**

# Key Findings of the Peer Review Team

## Overview

GWA has not had a strong history in meeting the water and wastewater needs of its customers since its inception. As a result, the utility has not been viewed positively in the past by the people of Guam. More recently, under the leadership of the CCU and a new General Manager, great effort by the GWA staff has been put into turning around this image. The QualServe Peer Review Team has noted dramatic improvements since the last review in November, 2002. Improvements include the ability to provide safe water, stabilizing water pressure, identifying and repairing leaks, increased operator certification, etc. However, much remains to be done and the challenges are huge, possibly beyond the capability of the current organization without at least selective but significant outsourcing, particularly for implementation of the capital program, under oversight of GWA senior management. Water loss must be addressed, major portions of water system infrastructure must be replaced, while continuing to repair and maintain the system, aquifer protection must involve both GWA and GEPA, and customer service initiatives must be accomplished in order for the utility to meet best practices standards, to comply with the U.S. EPA requirements, and to meet the long-term needs and expectations of the people of Guam.

This report first describes our key findings – the key Strengths, Opportunities of Improvement, and Barriers. Next are our findings of Strengths and Opportunities for Improvement in each of the 17 Business Process Categories evaluated in our review. We strongly recommend that GWA create a Continuous Improvement Tracking Program that assigns one point person to each of the 17 categories, and regularly tracks each Opportunity for Improvement by due date and point person, at Senior Management Team meetings. We hope that our report will help GWA to continue to improve and be successful in its challenges ahead.

Despite apparent support by the people of Guam for public management of water and wastewater service (as is the situation in the overwhelming majority of water/wastewater entities on the U. S. mainland), calls for privatization from the business community are being strongly voiced. The calls will only get louder if the utility does not rapidly improve its management capabilities (operating and capital), and falters on its requirement to follow through on the EPA Stipulated Order. The utility employees are motivated, and they must be properly trained and work hard if they wish to maintain a publicly operated utility. The peer reviewers have seen mixed results from public/private partnerships on the mainland. In order for there to be any success with privatization, extremely well written contract provisions must be developed and enforced. If not, privatizers will quote low initial

prices and raise the rates significantly in later years of a long-term contract; after all, the primary motive of private enterprise is to deliver returns (profits) to its stakeholders. This is why historically in the United States, the public has demanded their water and wastewater service, so critical to life and preservation of the environment, be entrusted to public management and operation.

The current GWA leadership has approached the management of the utility much like a privatizer – reducing staff, cutting costs, and introducing greater efficiencies into the organization. If such an approach is continued, GWA may have the opportunity to manage the Navy water/wastewater facilities which should further reduce costs and achieve greater levels of efficiencies. On the other hand, failure to follow through on proposed initiatives will further reduce any confidence that the public may have, and GWA would need to move to a public/private partnership to best serve the people of Guam.



# Key Findings of the Peer Review Team

## Strengths

- GWA's level of service and financial position has experienced significant improvement in the past 2 years under its new leadership.
- Guam has an abundant supply of fresh water.
- GWA and the people of Guam have deeply-held principles involving the value they place on clean water and protection of the environment.
- The employees are working with a new spirit of empowerment and are dedicated to providing high quality service to the people of Guam and to meeting the U.S. EPA Stipulated Order, provided they have the resources.
- The organization is operating more efficiently through the reduction of approximately 100 positions.
- Drinking water produced by GWA is now meeting SDWA requirements.
- The old pare-pare system has been essentially dismantled under the CCU Board structure and new General Manager:
  - Hiring and contracting are being driven by qualifications rather than by "connections", and
  - The CCU has worked effectively to significantly reduce external political interference with the day-to-day operations of GWA.
- A water and wastewater master plan that includes public input is being developed, providing a road map for GWA into the foreseeable future.
- Most wastewater pump stations are now equipped with stand-by generators, and have redundant pumping capacity.
- There have been significant increases in the percentage of certified operators.

# Key Findings of the Peer Review Team

## Opportunities for Improvement

### Leadership and Organization

- GWA needs to more fully explore a broader range of alternative public and public/private partnership models for meeting the EPA Stipulated Order. The Peer Team agrees that GWA's challenges are huge, and that the current organization may not yet be fully capable of meeting that challenge. However, we feel that other approaches that combine public control and selected outsourcing (including capital program management) may be more beneficial to the people of Guam.
- The process to date for developing a public/private partnership model may have been more successful had the community been more involved. GWA and its governing board need to more actively involve its employees and ratepayers in the public/private decision making process, so that the most effective model is selected to meet the needs of the ratepayers. This is critical to avoid divisiveness and loss of productivity at a critical turning point when significant improvements have been made under new leadership and a newly empowered work force is emerging.
- GWA must continue to bolster its management, administrative and technical staff resource capability to ensure it can meet the U.S. EPA Stipulated Order.
- A joint task force of GWA and GPA should be considered to find ways to benefit from efficiencies. One example might be GPA providing electrical engineering and electrician expertise and/or training support to GWA.
- GWA should move aggressively forward to retain a program management consultant to implement the large Capital Improvement Program, under the dedicated oversight of GWA Senior Management (Chief Engineer or other CIP Manager)
- Pay scale of certain, hard-to-recruit key positions (certified operator, professional, scientists, etc.) should be evaluated through a compensation study to ensure that compensation is not an obstacle to attracting needed talent.
- A comprehensive technical training program is essential to improving the skills of technical and administrative staff, including operators (certification), mechanics, electricians, customer service representatives, etc.
- Notwithstanding the tremendous increase in efficiency and substantial cost reduction that have significantly improved GWA's financial position, staffing levels need to be re-

evaluated. There are several areas that appear to be currently understaffed, by several positions, including CIP management, customer services, administrative support to the operating divisions, and technical training.

### **Continue to Restore Customer Confidence and Trust**

- GWA must work collaboratively with GPA, perhaps through a joint task force or networking group, to solve the ongoing issue of GPA voltage variation which leads to GWA wastewater pump station motor failures and subsequent wastewater overflows that can impact drinking water.
- Expansion of GWA's system should be paid by new development, perhaps via a system capacity charge, and the burden not be placed on the backs of existing rate-payers who already have "paid in" to own the systems.
- Each employee must have the technical training to succeed, and must be held accountable for a high level of performance.
- GWA must be more visible and reach out more to important constituencies in the Guam community. We recommend the development of a community liaison group comprised of ratepayers, the business community, the media and other governmental agencies including the U.S. Air Force and Navy, to keep GWA "stakeholders" aware of GWA activities and progress, to receive input and suggestions, and to build stakeholder confidence.

### **Achieve Financial Self-Sufficiency**

- Establishing reliable funding sources in a timely manner is absolutely critical to ensuring that GWA can meet U. S. EPA requirements and provide a high level of water and wastewater service to *all* of its customers.
- Ensure that any public-private-partnership, if implemented, keeps rate-setting under GWA control.
- GWA should utilize its "grant-writer" to seek Federal and other grants and low interest loan funding. Guam is a very strategic military location for the United States, which may significantly benefit from expansion and a reliable water/wastewater infrastructure, which the federal government may be willing to help fund.
- Water loss is well above industry standards. Identifying the sources of water loss and significantly reducing it through elimination of potentially illegal connections and infrastructure replacement will increase GWA's long-term economic viability.

### **Demonstrate Environmental Stewardship**

- Preserve and protect Guam's precious environmental resources as "Job One".
- Implement the Capital Improvement Program and all other requirements of the U.S. EPA Stipulated Order to ensure compliance with federal environmental regulations.
- Phase out septic systems on Guam, and preclude septic systems over drinking water aquifers.
- Require new housing development over drinking water aquifers to install sanitary sewer systems and fund the sewer transmission lines to reach the development as required by GWA rules and regulations or do not allow the development to occur.

# Key Findings of the Peer Review Team

## Barriers

We observed the following barriers or obstacles that could inhibit successful improvement efforts. These may be beyond the control of GWA, and may require action by the Government of Guam or the Federal Government to resolve.

- Past mismanagement of financial resources
- Business interests (e.g. Chamber of Commerce) appear to be better articulated to GWA's Board than the collective interests of the ratepayers on the issue of public/private management of GWA.
- Some aspects of the Civil Service System do not allow for the flexibility of positions needed for a modern-day water/wastewater utility.
- GWA needs to recognize the need to deepen and broaden management and technical capability to accomplish the Stipulated Order.
- Past mismanagement of water and wastewater infrastructure assets, which allowed them to significantly deteriorate.
- Pay scales, which for some job classes, are an obstacle to attracting top-notch talent.
- Remote geographic location, making recruitment of top-notch professional, administrative, technical and O&M staff difficult.

# Leadership and Organization

Guam Waterworks Authority

| <b>Strengths</b>  | <b>Opportunities for Improvement</b>   |
|---|--|
| <ul style="list-style-type: none"><li>+ The CCU and General Manager (GM) are successfully leading GWA in the right direction, with many significant accomplishments in the past two years.</li><li>+ Organizational effectiveness and morale has improved under new management.</li><li>+ GWA is actively pursuing filling required DRC operator positions to comply with Stipulated Order (SO).</li><li>+ A professional GM is in place at GWA that understands the needs of a medium-sized water/wastewater utility.</li><li>+ The old pare-pare system is being dismantled under the new CCU Board structure.</li><li>+ An Assistant GM has been hired to develop a plan for consolidated operations for GWA/GPA.</li><li>+ GM's hands-on, visible in-the-field style has helped improve organizational morale. Many employees, from managers down to line staff, as well as Board Members, have commented that the current GM is "the best we've had".</li><li>+ The GM has successfully re-sized the organization through the reduction of approximately 100 positions, significantly reducing costs while improving organizational performance.</li><li>+ The CCU has worked effectively to eliminate external political interference with the day-to-day operation of GWA, including ensuring that employees and consultant selections, are based on best qualified and contracts selected based on low responsible bid.</li></ul> | <ul style="list-style-type: none"><li>○ Resolve the outstanding issues that are prohibiting the utility from moving forward with necessary bond sales to secure funds for Stipulated Order (SO) improvements as soon as possible.</li><li>○ The "privatization exploration" effort, at \$1.5 million appears to have been extremely expensive for the work product provided. Additionally, the process utilized to manage the contract effort was somewhat isolated from GWA staff involvement, which appears to have created organizational "confusion".</li><li>○ GWA should develop the management capabilities and capacity to develop a comprehensive strategic plan.</li><li>○ Need to implement an employee recognition program.</li><li>○ Consider a full time CFO.</li><li>○ GWA should develop contract language with consultants that hold them accountable for financial penalties when they miss SO deadlines.</li><li>○ Need to continue to regain public confidence.</li><li>○ Develop a community liaison group comprised of business, media, other governmental and community representation, to keep the outside communities aware of GWA activities and progress, and to receive input.</li></ul> |

# Continuous Improvement

Guam Waterworks Authority

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| Strengths   | Opportunities for Improvement   |
|---|---|
| <ul style="list-style-type: none"><li>+ GWA is applying techniques of Performance Indicators to monitor their progress in continuous improvement</li><li>+ Involved in second QualServe Review demonstrating organizational interest for performance improvement.</li></ul> | <ul style="list-style-type: none"><li>○ <b>Implement a program among GWA employees that promotes continuous improvement and makes the concept very visible to staff and visiting customers.*</b></li><li>○ Focus on strengthening organizational capabilities in the area of CIP management, strategic planning, customer services and technical training.</li><li>○ Employees need to be held accountable to performance expectations. Chronic non-performance by individuals needs to be dealt with by their supervisor with coaching and training, as appropriate, and if that is unsuccessful, via a performance improvement program that will lead to improvement or ultimate termination.</li></ul> |

\* Similar comment provided during 2002 review indicated by **bold type**.

# Human Resources Management

Guam Waterworks Authority

| Strengths  | Opportunities for Improvement  |
|--|--|
| <ul style="list-style-type: none"><li>+ GWA has secured a \$200,000 grant from DOI to engage the Micronesia Water And Wastewater Institute in a technical training program for staff.</li><li>+ GWA has been able to recruit Class IV operators through the AWWA and WEF employment websites.</li><li>+ GWA employees are career oriented and normally stay with the utility for a long time.</li><li>+ Training opportunities for employees are potentially available through numerous sources e.g. the Univ. of Guam, the Guam Community College, on-line.</li><li>+ Performance plans, performance improvement plans, and performance appraisals are being regularly prepared by each supervisor/ manager to provide honest feedback and to help improve employee performance.</li><li>+ Operator Certification is now driving who is promoted and salary levels in the operating divisions.</li><li>+ Sending key staff to industry conferences (AWWA, WEF) to stay abreast of new technologies.</li></ul> | <ul style="list-style-type: none"><li>○ There is some uncertainty about what the response will be to a new union that has formed at GWA in the past 6 months</li><li>○ Need to re-evaluate staffing levels – some areas seem to be minimally manned, such as customer service.</li><li>○ Administration needs to work with operating agencies on a comprehensive technical training program.</li><li>○ Provide a dedicated operator trainer to allow staff the opportunity to increase their knowledge.</li><li>○ Supervisor must be accountable for staff that have been committed to training but do not show up.</li><li>○ Merit incentive pay for managers should be explored, to reward outstanding performance.</li><li>○ A salary study should be considered as pay scales are generally too low for effective recruitment of qualified professional administrative and technical staff.</li><li>○ <b>Develop a strong technical training (including an apprenticeship) program, perhaps in partnership with the Guam Community College to help operators gain certification.</b></li></ul> |



# Capital Improvement Program

Guam Waterworks Authority

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| Strengths  | Opportunities for Improvement   |
|--|---|
| <ul style="list-style-type: none"><li>+ GWA has been proactive in obtaining federal grants for capital projects.</li><li>+ A detailed Water Resource Master Plan and the Stipulated Orders (SO) of the US EPA will give GWA a roadmap for needed capital improvements for the foreseeable future.</li><li>+ A new Chief Engineer has been hired.</li></ul> | <ul style="list-style-type: none"><li>○ <b>Establish reliable funding sources to cover the costs for CIP projects that are crucial to the proper operation of the utility.</b></li><li>○ Engineering needs to provide strong CIP leadership.</li><li>○ Management of the Capital Improvement Program needs to be assigned to a senior management staff person (e.g. Chief Engineer) and appropriate staff assigned to oversee the program.</li><li>○ GWA should strongly consider outsourcing to a program management consultant the implementation of the large CIP under the oversight of senior GWA management.</li><li>○ Need to utilize the fixed assets model that is in the JD Edwards computer program and provide appropriate training to the accounting staff.</li><li>○ Engineering should coordinate equipment/system start-up training by manufacturers on capital projects.</li><li>○ Specify corrosion-resistant materials such as stainless steel and aluminum in lieu of carbon steel for locations such as Agana WWTP where corrosion potential is very high.</li><li>○ Standardize on equipment (pumps, valves, blowers, emergency generators) whenever possible to reduce life cycle costs and for ease of maintenance/stocking of spare parts.</li></ul> |

# Strategic Planning

Guam Waterworks Authority

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| Strengths   | Opportunities for Improvement   |
|---|---|
| <ul style="list-style-type: none"><li>+ A Water and Wastewater Master Plan is being developed that will provide a roadmap for GWA for the foreseeable future.</li><li>+ Public input/meetings were held during the preparation of the Water and Wastewater Master Plan.</li></ul> | <ul style="list-style-type: none"><li>○ GWA must bolster its management and technical staff capability to ensure it can meet the timeline for completion of EPA stipulations order requirements.</li><li>○ <b>A strategic business plan needs to be developed to pull together all aspects of the utility including leadership, finance, infrastructure, and customer services through a process that involves the CCU and GWA employees.</b></li><li>○ The utility needs to address the installation of septic systems over the aquifer.</li></ul> |

# Finance and Fiscal Management

Guam Waterworks Authority

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| Strengths  | Opportunities for Improvement   |
|--|---|
| <ul style="list-style-type: none"><li>+ Substantial rate increases have been implemented after many years of no increases.</li><li>+ GWA revenues are projected to exceed expenses this year after many years of losses.</li></ul> | <ul style="list-style-type: none"><li>O The ability to obtain funds from the bond market is absolutely critical to ensuring that GWA is able to provide water and wastewater services to its customers.</li><li>O GWA needs to move toward a cost of service approach that will ensure that their costs are recovered through the water and wastewater rate structure.</li><li>O <b>Incorporate additional tiers in the rate structure to promote water conservation.</b></li><li>O Meter reading exceptions need to be accomplished on a timely basis.</li><li>O Consider staffing a position dedicated to developing Federal grant applications.</li><li>O Need to move forward on the implementation of a new billing system.</li><li>O Use outside bond counsel and a financial advisor.</li><li>O Make life line rate based on financial need rather than just being a customer of GWA</li></ul> |

# Plant and Property Management

Guam Waterworks Authority

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| Strengths  | Opportunities for Improvement  |
|--|--|
| <p>+ GWA is developing a comprehensive list of utility properties.</p> | <ul style="list-style-type: none"><li>O A systematic program for CIP replacement is needed in order for GWA to operate effectively.</li><li>O Need to follow through on the proposed meter replacement program in order to reduce the amount of unaccounted for water to an acceptable level.</li><li>O An asset management system is needed to help make effective replacement vs. repair decisions.</li><li>O Need to improve the aesthetics of GWA facilities through painting and appearance to reflect a more positive image to the public, particularly headquarters and the customer service area.</li><li>O Need to address security issues for GWA assets around the island.</li><li>O <b>Establish a preventative maintenance program.</b></li></ul> |

# Purchasing

Guam Waterworks Authority

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| <b>Strengths</b>   | <b>Opportunities for Improvement</b>  |
|--|---|
| <p>+ There are initiatives underway (“barrier” legislation) which will enable GWA to develop a more efficient procurement process.</p> | <ul style="list-style-type: none"><li>○ <b>Need to return to using the computer based inventory system.</b></li><li>○ <b>Strive to standardize on pumps/parts for ease of maintenance, and to keep spare costs down.</b></li><li>○ Increase inventory of spares to reduce expensive replacements in emergencies.</li><li>○ Need to ensure that vendors are paid in a timely fashion. Failure to do so will adversely impact the ability to obtain needed supplies, equipment and parts.</li></ul> |

# Watershed Management

Guam Waterworks Authority

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| <b>Strengths</b>  | <b>Opportunities for Improvement</b>   |
|---|--|
| <ul style="list-style-type: none"><li>+ Have significantly reduced wastewater pump station overflows into drinking water aquifers</li><li>+ Detention basins and wetlands are used to mitigate stormwater run-off issues.</li><li>+ A sewer lateral revolving loan fund has been established by the CCU to assist with connecting unsewered accounts to the public wastewater system.</li></ul> | <ul style="list-style-type: none"><li>○ <b>Develop a wet-weather master plan to address infiltration/inflow and overflow issues during storm events.</b></li><li>○ The Agat WWTP needs to be expanded to provide adequate dry weather treatment capacity</li><li>○ <b>Encourage the phasing out of septic tank systems, connecting all customers with sewers.</b></li><li>○ GWA and GEPA must work together to protect the aquifer from unsewered development.</li></ul> |

# Collection System Operations and Maintenance

Guam Waterworks Authority

| Strengths   | Opportunities for Improvement   |
|---|---|
| <ul style="list-style-type: none"><li>+ Several major recommendations of the 2002 QualServe report have been successfully implemented.</li><li>+ Significant increase in the percentage of certified operators in the past 30 months.</li><li>+ Reorganization has improved engineering and maintenance support for the wastewater collections O&amp;M.</li><li>+ A high percentage of wastewater collection pumping stations are equipped with standby generators to reduce wet weather overflows, and nearly all have redundant pumping capacity.</li><li>+ “Pay for skills” (DRC) program has provided an excellent incentive for multi-skilled operators.</li><li>+ Morale in the wastewater collections group is relatively high; people feel that reorganization is moving in the right direction and training opportunities have increased.</li><li>+ Odors are generally not a problem in the collection system.</li><li>+ Electronic O&amp;M manuals are nearing completion.</li></ul> | <ul style="list-style-type: none"><li>○ The Guam Power Authority’s (GPA) power at times has too great a variation in line voltage, leading to the burning up of GWA collection system pump motors, occasionally causing wastewater overflows. Recommend formation of an inter-agency task force to resolve issue.</li><li>○ A significant investment in collection system infrastructure is needed to replace transmission lines and pumping station electrical and instrumentation systems that are nearing or have reached the end of their useful life.</li><li>○ Several “ejector” stations need to be upgraded to pumping stations, as average wastewater flows have increased over the years to require near-continuous pumping.</li><li>○ <b>A pump station master plan is needed to establish the prioritization for capital improvements.</b></li><li>○ <b>A proactive video inspection program should be implemented to identify lines requiring cleaning or replacement before blockages/failures occur.</b></li><li>○ Gas meters are needed for collection system crews to ensure safety prior to entering pump station wet wells and other confined spaces. This is a serious deficiency, as entry into a space without adequate oxygen or high levels of toxic gases can lead to serious injury or death.</li><li>○ Additional administrative and operating support staff needed for responding to customer complaints.</li></ul> |

# Wastewater Treatment Operations and Maintenance

Guam Waterworks Authority

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| Strengths   | Opportunities for Improvement  |
|---|--|
| <ul style="list-style-type: none"><li>+ GWA has significantly increased the number of operators who are certified, improving its operational capability.</li><li>+ The reorganization of several engineers and maintenance personnel into the wastewater treatment /water production group has greatly improved the responsiveness of engineering/maintenance support.</li><li>+ Top leadership in wastewater treatment operation and maintenance is a very capable, competent individual, with effective management and leadership skills.</li></ul> | <ul style="list-style-type: none"><li>O The wastewater treatment infrastructure is generally in serious need of replacement. Much of the mechanical and electrical equipment is nearing or at the end of its useful life and its replacement is critical to meeting NPDES requirements.</li><li>O A corrosion control plan is needed to address severe corrosion at the Agana WWTP and other facilities. Material selection, protective coating specs, and a painting program should be part of the plan.</li><li>O <b>There has been some improvement in permit compliance since 2002 (e.g. Umatec Plant), however, compliance continues to be an area where significant improvement is needed.</b></li><li>O Implementation of the Capital Program is essential to permit compliance.</li><li>O A SCADA system and automated controls are needed to modernize treatment facilities and streamline operations.</li><li>O Need technical training for operators, mechanics, electricians and other key trades.</li><li>O Ensure long-term that each process has at least one redundant unit.</li></ul> |



# Biosolids Management

Guam Waterworks Authority

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| Strengths   | Opportunities for Improvement   |
|---|---|
| <ul style="list-style-type: none"><li>+ GWA is cost-effectively disposing of their biosolids.</li><li>+ Some GWA biosolids are recycled for agricultural use.</li></ul> | <ul style="list-style-type: none"><li>O <b>A long-term biosolids management plan should be developed and implemented.</b></li><li>O Need to stabilize biosolids prior to disposal.</li><li>O <b>Wastewater treatment plants need to implement a system for tracking quantities and disposition of all off-hauled biosolids.</b></li><li>O Biosolids management was the Business Process Category with the highest overall “No Response” (~35 %), indicating a need to internally communicate the agency’s biosolids management program.</li><li>O Diversification of biosolids management options should be considered, as landfilling may not be a long-term sustainable option.</li><li>O Dewatering equipment at large plants is in urgent need of replacement, to ensure continued cost-effective, reliable biosolids management.</li></ul> |

# Permitting / Air and Water Quality

Guam Waterworks Authority

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| Strengths  | Opportunities for Improvement   |
|--|---|
| <ul style="list-style-type: none"><li>+ The water system is now in compliance with the Safe Drinking Water Act.</li><li>+ Key leaders have significant experience in managing NPDES permits.</li><li>+ Wastewater pumping stations are nearly all furnished with standby generators and redundant pumping units.</li><li>+ Sampling and lab analysis in accordance with NPDES permit requirements is routinely done.</li></ul> | <ul style="list-style-type: none"><li>O NPDES compliance still needs to be significantly improved for the wastewater system, with most plants out of compliance.</li><li>O Need certified operators in all plants to help ensure permit compliance.</li><li>O <b>Improve communication between lab and operations to improve sampling effectiveness and efficiency.</b></li><li>O Wastewater and Lab Managers need to work collaboratively to ensure that 5-day BOD samples are composite and not grab samples.</li><li>O Need to ensure that biomonitoring requirements are met.</li><li>O Develop a computerized Laboratory Information Management System (LIMS).</li></ul> |

# Water Resources

Guam Waterworks Authority

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| <b>Strengths</b>   | <b>Opportunities for Improvement</b>  |
|--|---|
| <ul style="list-style-type: none"><li>+ Adequate recharge of the source water aquifer is occurring.</li><li>+ A Water Resource Master Plan nearing completion will provide a roadmap for needed improvements, and is expected to be completed by 2006.</li><li>+ GWA participates in island-wide water planning.</li><li>+ GWA has taken a firm position that expansion/development pays for new infrastructure required, rather than being supported by the existing rate payers.</li></ul> | <ul style="list-style-type: none"><li>○ <b>Illegal dumping of waste occurs over the ground water aquifer, potentially contaminating the source water. The ground water system is in danger of being categorized as a "groundwater under the influence of surface water".</b></li><li>○ Water conservation measures have not been taken in the past to preserve the island water supply.</li><li>○ Continue the study that compares water accounts to sewer connections to identify non-sewered accounts that should be tapped into the public sewer system.</li><li>○ Water loss needs to be accurately identified to determine whether current water resources are adequate for future growth.</li></ul> |

# Water Treatment Operations and Maintenance

Guam Waterworks Authority

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| Strengths   | Opportunities for Improvement  |
|---|--|
| <ul style="list-style-type: none"><li>+ Disinfection has been added at each well that helps to ensure a distribution system residual of 0.2 mg/l.</li><li>+ The water quality of the Ugum WTP has improved in the last year as a result of better trained operators improving treatment processes and getting equipment working properly.</li></ul> | <ul style="list-style-type: none"><li>O Information collection of water treatment processes is done manually. SCADA system should be implemented to automate systems so that operators can concentrate on compliance.</li><li>O Chlorine gas systems are present at all 110 wells giving cause for concerns of safety. Some of these wells are in highly populated areas, including school yards.</li><li>O Staffing levels at Ugum WTP are very tight for a 24/7 operation, requirement pre-planned scheduling and close management of approved leave requests.</li></ul> |

# Water Distribution Operations and Maintenance

Guam Waterworks Authority

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| Strengths   | Opportunities for Improvement  |
|---|--|
| <ul style="list-style-type: none"><li>+ GWA is instituting a pilot program for distribution system preventative maintenance.</li><li>+ The procedure for re-energizing a depressurized water main under repair has proven to be effective from a water quality perspective.</li><li>+ The utility understands the benefits of leak detection and has staff designated to the program.</li></ul> | <ul style="list-style-type: none"><li>○ The 2" water mains supplying domestic needs but incapable of meeting fire flows need to be replaced with adequately sized mains.</li><li>○ Service line leaks on old galvanized pipe are a constant maintenance occurrence and should be replaced with more reliable materials such as copper.</li><li>○ Staffing for collections and distribution may benefit from restructuring.</li><li>○ Institute a water main replacement program.</li><li>○ Implement a strong cross connection control program to eliminate incidences that result in boil water notices.</li><li>○ <b>Adequate distribution system maps need to be prepared expeditiously and made available to field crews. (GIS)</b></li><li>○ Investigate and implement appropriate equipment to clean or regulate unreliable power causing pump motor damage.</li><li>○ A valve exercising and water main flushing program is needed to increase the reliability of the distribution system.</li><li>○ A reservoir and tank cleaning program would benefit water quality and aid in assessment of infrastructure.</li><li>○ <b>A SCADA system would benefit the operations staff.</b></li></ul> |

# Drinking Water Quality Management

Guam Waterworks Authority

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| <b>Strengths</b>  | <b>Opportunities for Improvement</b>  |
|---|---|
| <ul style="list-style-type: none"><li>+ The water quality of the Ugum WTP has improved in the last year as a result of better trained operators improving treatment processes.</li><li>+ GWA Water Quality manager is a former GEPA regulator with good relations and a strong support system</li><li>+ Chlorine residuals in the distribution system have consistently met the 0.2 ppm regulatory requirements providing a safe water to GWA customers.</li><li>+ Last round of monitoring for lead and copper rule came into compliance for the first time.</li><li>+ GEPA indicates that monitoring requirements not being met formerly are now being met.</li></ul> | <ul style="list-style-type: none"><li>○ Customer complaints average about 20/mo. Keeping the lab staff busy following up.</li><li>○ Implement a strong cross connection control program to eliminate incidences that result in boil water notices.</li><li>○ Implement the water supply project that will make GWA independent of the Navy supply to avoid possible D/DBP violations in the future.</li><li>○ Investigate chlordane contamination of well (now taken out of service) to determine if a larger problem exists.</li></ul> |