

1 **GUAM CONSOLIDATED COMMISSION ON UTILITIES**

2 **RESOLUTION NO. 47-FY2016**

3 **RELATIVE TO APPROVING CONTRACT AMENDMENT NO. 6 FOR**  
4 **PROGRAM MANAGEMENT SERVICES**

5 **WHEREAS**, under 12 G.C.A. § 14105, the Consolidated Commission on Utilities  
6 (“CCU”) has plenary authority over financial, contractual and policy matters relative to the  
7 Guam Waterworks Authority (“GWA”); and  
8

9 **WHEREAS**, the Guam Waterworks Authority (“GWA”) is a Guam Public Corporation  
10 established and existing under the laws of Guam; and  
11

12 **WHEREAS**, on December 12, 2011 GWA received approval by the CCU via Resolution  
13 No. 11-FY2012 to seek from the PUC a request for approval to execute an initial contract with  
14 the engineering consultant “Brown & Caldwell” for Program Management Services at a cost not  
15 to exceed \$3.2 million; and  
16

17 **WHEREAS**, Resolution No. 11-FY2012 resolved that the General Manager is authorized  
18 an increase in obligating authority to effectuate a contract with Brown & Caldwell subject to  
19 CCU and PUC approval; and  
20

21 **WHEREAS**, the PUC ORDER via GPA Docket 11-02 dated March 21, 2011 authorized  
22 GWA to execute a contract with Brown and Caldwell for Program Management Services; and  
23

24 **WHEREAS**, GWA has utilized the PMO for various engineering services, financial  
25 analysis, operational training and determine the need for additional services above the original  
26 contract value and as such sought and received approval from the CCU via Resolution No. 53-  
27 FY2012, Resolution No. 34-FY2013, Resolution No. 07-FY2014, Resolution No. 37-FY2014  
28 and Resolution No. 39-FY2015 to seek PUC approval to increase the contract value for the PMO  
29 services by an additional One Million Two Hundred Thousand Dollars (\$1,200,000.00), Two  
30 Million One Hundred Sixty Six Thousand Ninety One Dollars (\$2,166,091.00), Three Million  
31 One Hundred Ninety Nine Thousand Four Hundred Ninety Three Dollars (\$3,199,493.00), Two  
32

1 Million Four Hundred Fifty Eight Thousand Three Hundred Fifteen Dollars (\$2,458,315.00) and  
2 Five Million Three Hundred Three Thousand One Hundred Forty Five Dollars (\$5,303,145.00)  
3 respectively; and  
4

5 **WHEREAS**, the PUC ORDER via GPA Docket 11-02 dated April 30, 2013, the GWA  
6 Docket 13-01 dated December 30, 2013, July 31, 2014 and December 29, 2014, and the GWA  
7 Docket 15-07 dated September 24, 2015 approved GWA's request to increase the contract value  
8 for the PMO an additional One Million Two Hundred Thousand Dollars (\$1,200,000.00), Two  
9 Million One Hundred Sixty Six Thousand Ninety One Dollars (\$2,166,091.00), Three Million  
10 One Hundred Ninety Nine Thousand Four Hundred Ninety Three Dollars (\$3,199,493.00), Two  
11 Million Four Hundred Fifty Eight Thousand Three Hundred Fifteen Dollars (\$2,458,315.00) and  
12 Five Million Three Hundred Three Thousand One Hundred Forty Five Dollars (\$5,303,145.00)  
13 respectively to the PUC dockets noted above; and  
14

15 **WHEREAS**, GWA management continues to support the fact that Brown & Caldwell  
16 provides tremendous benefits to GWA through subject matter expertise for all aspects of utility  
17 services provided by GWA, including issues or projects related to the 2011 Court Order as well  
18 as projects associated with USEPA State Revolving Funds (See Exhibit A); and  
19

20 **WHEREAS**, GWA management again seeks CCU approval to amend the contract with  
21 Brown & Caldwell to increase the contract value an additional Four Million Fifty Nine Thousand  
22 Eight Hundred Seventy Seven Dollars (\$4,059,877.00) for additional services to GWA (See  
23 Exhibit B); and  
24

25 **WHEREAS**, GWA management finds the cost associated with the PMO to be  
26 commensurate to average PMO cost to the original \$400M capital improvements program and  
27 the graph shown in Exhibit C illustrates the anticipated spending amounts for the PMO discussed  
28 with the PUC and the actual amounts approved by the PUC; and  
29

30 **WHEREAS**, GWA management further seeks CCU approval to take the first "option"  
31 per the contract language to extend the contact period with Brown and Caldwell for another two  
32 year term wherein the contract term will be extended to February 2019; and

1           **WHEREAS**, GWA management further seeks CCU approval to petition the PUC's  
2 approval to increase the contract value of the Program Management Services a funding increase  
3 "not to exceed" Four Million Fifty Nine Thousand Eight Hundred Seventy Seven Dollars  
4 (\$4,059,877.00) specific to additional PMO services; and

5  
6           **WHEREAS**, the source of funding will be from the 2010, 2013 and 2015 bond series  
7 proceeds, GWA revenue funds as well as State Revolving Funds that are applicable to the  
8 PMO's work and which are eligible to be used ; and

9  
10           **WHEREAS**, the GWA Chief Engineer will identify specific CIP line items that are to  
11 fund the additional contract value to the PMO; and

12  
13           **WHEREAS**, the GWA General Manager and Chief Engineer will develop a PMO  
14 Transition Plan for approval by the CCU which details the manner and timing in which certain  
15 PMO activities will be assumed by GWA staff, and specific specialized services and subject  
16 matter expertise will be provided beyond the PMO's contract period; and

17  
18           **NOW BE IT THEREFORE RESOLVED**, the Consolidated Commission on Utilities  
19 does hereby approve and authorize the following:

- 20  
21           1. The recitals set forth above hereby constitute the findings of the CCU.  
22           2. GWA Management amend the contract with Brown and Caldwell for an additional,  
23           "not to exceed" Four Million Fifty Nine Thousand Eight Hundred Seventy Seven  
24           Dollars (\$4,059.877.00) for additional Program Management Services (Exhibit B).  
25           3. GWA management seek immediate PUC approval to increase the contract value for  
26           PMO services by Brown and Caldwell an additional "not to exceed" Four Million  
27           Fifty Nine Thousand Eight Hundred Seventy Seven Dollars (\$4,059.877.00).  
28           4. GWA management extend the contract period with Brown and Caldwell another two  
29           years wherein the contract term will be extended to February 2019.  
30           5. GWA management shall submit to the CCU for their review and approval, a PMO  
31           Transition Plan by February 2018.  
32

1           **RESOLVED**, that the Chairman certified and the Board Secretary attests to the adoption  
2 of this Resolution.

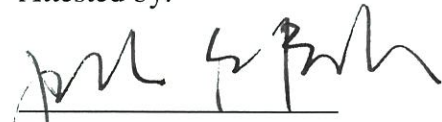
3  
4           **DULY AND REGULARLY ADOPTED**, this 26<sup>th</sup> day of July 2016.

5  
6           Certified by:

7  
8           

9           **JOSEPH T. DUENAS**  
10           Chairperson

11           Attested by:

12  
13           

14           **J. GEORGE BAMBA**  
15           Secretary

16  
17           I, J. George Bamba, Board Secretary of the Consolidated Commission on Utilities as  
18 evidenced by my signature above do hereby certify as follows:

19           The foregoing is a full, true and accurate copy of the resolution duly adopted at a regular  
20 meeting by the members of the Guam Consolidated Commission on Utilities, duly and  
21 legally held at a place properly noticed and advertised at which meeting a quorum was  
22 present and the members who were present voted as follows:

23           AYES:                               4            
24           NAYS:                                  0            
25           ABSTENTIONS:                     0            
26           ABSENT:                              1          



27           ///  
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**GUAM WATERWORKS AUTHORITY**

**Program Management Office  
Quarterly Report to the Public Utilities Commission**

**1<sup>st</sup> Quarter Report for 2016**

**Dated**

**03/31/2016**

## Preface

Guam Waterworks Authority (GWA) is committed to providing excellent water and wastewater products, programs and services in a safe, reliable, cost effective and responsible manner. GWA has made meeting the deadlines in the 2011 Court Order its top priority, including retaining an engineering consultant to help in the form of a Program Management Office (PMO). In addition, GWA has been subject to scrutiny by the USEPA through the NEIC Findings of Significant Deficiencies in the Water and Wastewater Systems and in the SRF Grants program. The PMO is being used to help GWA meet obligations in these programs.

The estimated \$300 million 2011 Court Ordered projects must be constructed by 2020. The 5-Year Capital Improvement Program (CIP) contains approximately \$457 million in water and wastewater projects. GWA is understaffed and needs the PMO to achieve court-order deadlines, the NEIC Significant Findings requirements, the USEPA SRF Project implementation requests, and other work that is necessary to achieve the CIP.

In recent years, GWA has emphasized employee and management training programs to increase the knowledge and skills of its workforce. The PMO is working with GWA to provide training of staff within the Engineering and Operations Divisions.

This quarterly report provides the status of projects in which the PMO is engaged. This information reflects a cut-off date of March 31, 2016.

### Section 1.0: Active and Completed Work Authorizations

This section includes a listing of the active work authorizations performed under GWA's Program Management Office during the reporting quarter. Table 1-1 below indicates each active work authorization, each work authorization budget, each invoiced amount prior to the current quarter, the amount invoiced in the current quarter, and the respective percent complete as of the cutoff date.

Work Authorization #	Project Title	Approved Budget	Invoiced Prior to Current Quarter	Invoiced in Current Quarter	Invoiced to Date	Percent (%) Complete
2012-14	NPDES Negotiation Support	\$246,000	\$212,539	\$0	\$212,539	86%
2013-02-A1	Phase II Constr Mgmt Agana WWTP Upgrades	\$326,450	\$326,445	\$0	\$326,445	100%*
2014-01-A2	Program Management Support	\$99,920	\$58,531	\$41,389	\$99,920	100%*
2014-02	Ugum WTP Operations Support	\$415,390	\$382,187	\$29,329	\$411,516	99%*
2014-03	NEIC Wastewater System Inspection	\$90,095	\$24,663	\$0	\$24,663	27%
2014-04	PUC Stipulations 2013	\$160,019	\$75,705	\$3,694	\$79,399	50%
2014-05	Groundwater Well Rehab Plan	\$373,350	\$354,080	\$0	\$354,080	95%*
2014-06	Water System Hydraulic Analysis	\$370,240	\$310,801	\$12,347	\$323,148	87%
2014-07	Hydraulic Model for Sewer System	\$250,324	\$216,292	\$32,768	\$249,060	99%*
2014-09	Formal Training Program	\$247,025	\$175,545	\$43,177	\$218,722	89%
2014-10	Design Management New Agat WWTP	\$499,630	\$451,168	\$39,651	\$490,819	98%*
2014-11	SRF Project Management	\$544,925	\$457,610	\$75,502	\$533,112	98%*

2014-12	Umatac-Merizo WWTP Water Quality Standards	\$357,827	\$200,428	\$52,489	\$252,917	71%
2014-13	Baza Gardens Wastewater Cross-Island Design	\$299,780	\$269,953	\$1,556	\$271,509	91%
2014-11-A1	SRF Project Management	\$544,925	\$0	\$61,799	\$61,799	11%
2015-01	Program Management Support	\$124,000	\$0	\$60,444	\$60,444	49%
2015-05	2015 Revenue Bond Financing	\$218,772	\$54,460	\$164,312	\$218,772	28%
2015-06	Facility Planning	\$590,746	\$0	\$123,789	\$123,789	21%
2015-07	Water Resources Master Plan Update	\$2,623,300	\$0	\$144,568	\$144,568	6%
<b>Total</b>		<b>\$8,382,718</b>	<b>\$3,570,407</b>	<b>\$886,814</b>	<b>\$4,457,221</b>	

\*Work Authorizations essentially complete but not formally closed.

Table 1-2 below is a listing of completed work authorizations performed under GWA's Program Management Office.

Table 1-2. Completed PMO Work Authorizations			
Work Authorization #	Work Authorization Title	Approved Budget	Final Amount Invoiced
2012-01	Program Management	\$956,700	\$956,700
2012-02	Programmatic Overview	\$28,548	\$28,548
2012-03	Northern District Interim Improvements	\$239,760	\$239,760
2012-04	Agat/Santa Rita Interim Measures	\$42,920	\$42,920
2012-05	Baza Gardens Interim Measures	\$46,200	\$46,200
2012-06	Agana Interim Measures	\$89,885	\$89,885
2012-07	Hydraulic Model	\$389,024	\$389,024
2012-08	Lifeline Program	\$5,269	\$5,269
2012-09	SSES Implementation	\$80,602	\$80,602
2012-10	Chaot/ Agana Heights Tank DB Package	\$271,071	\$271,071
2012-11	PUC Stipulated Order	\$131,554	\$131,554
2012-12	Phase I Facility Eval. Umatac-Merizo WW	\$105,635	\$105,635
2012-13	Phase I Ugum Inspection and Training	\$135,986	\$135,986
2012-15	Well Corrosion Specialist	\$48,610	\$48,610
2012-16	Umatac-Merizo Overflow	\$25,170	\$25,170
2012-17	NEIC Water System Support	\$288,488	\$288,488
2012-01-A2	General Program Management Support	\$289,414	\$289,414
2012-01-A3	General Program Management Support	\$583,709	\$583,709
2012-12-A1	WW Eval Umatac PH 2	\$205,172	\$205,172
2012-13-A1	Update O&M Manual Ugum SWTP	\$17,412	\$17,412
2013-01	Phase I PM Agana WWTP Upgrades	\$110,158	\$110,158
2013-02	Phase I CM Agana WWTP Upgrades	\$223,867	\$223,867
2013-03	Southern Sewer Basin SSES	\$452,329	\$452,329
2013-04	Central I/I Tech Support	\$47,991	\$47,991
2013-05	WW Eval Agat-SR & Baza Gardens	\$582,765	\$582,765
2013-06	Engineer's Report Revenue Bond	\$247,810	\$247,810

2013-01-A1	Phase II PM-Agana WWTP Upgrades	\$70,860	\$70,860
2014-01	Program Management Support	\$1,286,120	\$1,286,120
2014-01-A1	Program Management Support	\$100,000	\$100,000
<b>Total</b>		<b>\$7,103,029</b>	<b>\$7,103,029</b>

## Section 2.0: Work Authorization Highlights

This section includes information pertaining to work authorizations performed during this quarterly period. The information in this section contains: program successes and problems, project successes and status, and if applicable, projects exceeding budget and projects behind schedule.

Table 2-1 shows the work authorizations that were worked on during this quarterly period. Significant highlights of these work authorizations are provided to show the progress of each work authorization. Where appropriate, a summary of successes and/or problems are provided.



Table 2-1. Work Authorization Highlights for Active Work This Period

Work Authorization #	Work Authorization Title	Significant Highlights	Successes	Problems
2012-14	NPDES Negotiation Support	<ul style="list-style-type: none"> <li>No action this period</li> <li>Awaiting comments from USEPA on financial model</li> <li>Working with Consulting Environmental Attorney on strategy for negotiations with USEPA</li> </ul>		<ul style="list-style-type: none"> <li>USEPA indicated they are working on a consent decree for wastewater to be issued late 2016. USEPA issued draft NPDES permit for Agat-SR WWTP.</li> </ul>
2013-02-A1	Phase II Constr Mgmt Agana WWTP Upgrades	<ul style="list-style-type: none"> <li>No action this period</li> <li>Slated for close-out</li> </ul>	<ul style="list-style-type: none"> <li>Project is substantially complete</li> </ul>	
2014-01-A2	Program Management Support	<ul style="list-style-type: none"> <li>Attended weekly meetings between BC Program Coordinator, BC Program Controls Manager, and GWA General Manager, Chief Engineer, and Assistant GM of Compliance and Safety; weekly meetings focus on meeting deadlines from the Court Order, NEIC Findings of Significant Deficiency in the Water and Wastewater System, NPDES Permit compliance, and the PUC Ordering Provisions</li> <li>Continued to participate in meetings and periodic teleconferences with the GWA staff and USEPA</li> <li>Continued to support GWA on USEPA requests for information, status updates and action requirements</li> <li>Attended CCU and PUC board meetings</li> <li>Completed the Historic American Engineering Record (HAER) for the existing Asan Springs storage tank and submitted to SHPO.</li> </ul>	<ul style="list-style-type: none"> <li>Prepared response to USEPA letter regarding lack of disinfection of treated wastewater at Agat WWTP</li> <li>Addressed USEPA letters regarding outstanding project deadlines</li> </ul>	<ul style="list-style-type: none"> <li>Potential concern as to adding disinfection to existing Agat WWTP which will be removed from service within a year</li> <li>Awaiting SHPO approval to demolish existing Asan Springs facility to build new facilities up to code.</li> </ul>
2014-02	Ugum WTP Operations Support	<ul style="list-style-type: none"> <li>No action this period</li> <li>Assisted GWA in addressing findings of Final Plant Assessment Report</li> </ul>	<ul style="list-style-type: none"> <li>Final Plant Assessment Report was submitted to GWA Management</li> </ul>	<ul style="list-style-type: none"> <li>Ugum WTP requires significant rehabilitation</li> </ul>
2014-03	NEIC Wastewater System Support	<ul style="list-style-type: none"> <li>No action this period</li> </ul>		<ul style="list-style-type: none"> <li>Awaiting design and construction of improvements prior to completing the inspections.</li> </ul>

Table 2-1. Work Authorization Highlights for Active Work This Period

Work Authorization #	Work Authorization Title	Significant Highlights	Successes	Problems
2014-04	PUC Stipulations 2013	<ul style="list-style-type: none"> <li>Limited activity occurred on this task during the period</li> <li>Discussed data requests related to fire protection rates, water rate 3rd block and sewer volume rate with GWA staff</li> </ul>	<ul style="list-style-type: none"> <li>Issued Draft Technical Memorandum on Fire Protection Sprinkler Service</li> </ul>	<ul style="list-style-type: none"> <li>Requesting further information from GWA Accounting on meter sizes, and fire protection charges before issuing the final report.</li> <li>Delays may affect delivery schedule to the PUC</li> </ul>
2014-05	Groundwater Well Rehabilitation Plan	<ul style="list-style-type: none"> <li>No action this period</li> <li>Stated for close-out</li> <li>Provided updates to GIS model</li> </ul>		
2014-06	Water System Hydraulic Analysis	<ul style="list-style-type: none"> <li>Continued to conduct system-wide hydraulic studies as requested by GWA to resolve low flow and low pressure problems in the system, Rt. 8 at Donut Hole, evaluated Cross Island water line Windward Hills and Sinfa.</li> <li>Continued to provide recommendations to GWA on pressure management; analyzed pressure data received from GWA</li> <li>Assisted with selection of sites for Barrigada Area SCADA for the water system and reviewed the Scope of Work and fee negotiation with consulting engineer.</li> </ul>	<ul style="list-style-type: none"> <li>Issued Final Pressure Zone Realignment TM</li> </ul>	
2014-07	Hydraulic Model for Sewer System	<ul style="list-style-type: none"> <li>Continued to conduct system-wide wastewater hydraulic studies as requested by GWA and identified by NEIC as deficient</li> <li>Continued working with GWA on field investigations to answer questions proposed to them about line connections, abandoned/proposed lines, and other information needed for the sewer model</li> <li>Prepared final reports on Sewer Models for Baza Gardens-Talafofo, Agat-Santa Rita, and Umatac-Merizo sewer basins</li> <li>Continued working with GWA to resolve connectivity questions on Central District</li> <li>Conducted meetings with GWA operations staff to discuss specific sewer connection problems and incorporated the results of the meeting into the hydraulic sewer model</li> </ul>	<ul style="list-style-type: none"> <li>Updated GIS models based on information gathered from GWA</li> </ul>	

Table 2-1. Work Authorization Highlights

Work Authorization #	Work Authorization Title	Significant Highlights	Successes	Problems
2014-09	Formal Training Program Assistance	<ul style="list-style-type: none"> <li>Issued the Training Master Plan and Training Implementation Plan to GWA</li> </ul>	<ul style="list-style-type: none"> <li>Issued the Training Master Plan and Implementation Plan</li> </ul>	
2014-10	Design Management New Agat WWTP	<ul style="list-style-type: none"> <li>Limited activity this period</li> <li>Continued to support construction management meetings for Agat-Santa Rita WWTP</li> <li>Continue to work with NAVFAC to obtain easement across Navy property for water line to serve the new WWTP</li> </ul>	<ul style="list-style-type: none"> <li>Construction for vertical plant is underway. Site Preparation is nearing completion</li> </ul>	
2014-11	SRF Project Management	<ul style="list-style-type: none"> <li>Coordinated and supported GWA on preparation of PIPs, SOWs, TMs, Construction Bid Packages, and RFPs for USEPA SRF-funded projects</li> <li>Coordinated with GWA and USEPA at regular meetings to discuss status of SRF projects</li> <li>Projects with GWA awaiting execution: IFB for Deep Well Rehab D-series for Construction, Projects in procurement process: IFB for Baza Gardens SSES Sewer Rehabilitation, IFB for Deep Well Rehabilitation D-series construction, RFP for A-series Deep Well Rehabilitation Engineering Design, Tamuning Hot Spots</li> <li>Coordinate scoping and negotiation meetings with selected firms for engineering and construction management services</li> <li>Negotiated on scope of work and fee with design engineers and construction managing engineers who were selected for the SRF projects</li> <li>Reviewed design and construction management fees and provided letters of recommendation to execute contracts with selected firms based on negotiations</li> <li>Assisted GWA in attaining CCU approval for recommended construction management and design services by developing CCU Resolutions</li> <li>Assisted GWA in obtaining procurement documents to finalize contracts for execution with selected engineering firms for project services</li> <li>Continued to work with GWA to maintain a project management spreadsheet for EPA Grants Report to provide USEPA updated timelines for each SRF project</li> <li>Stated for close-out</li> </ul>	<ul style="list-style-type: none"> <li>Engineering work underway                             <ul style="list-style-type: none"> <li>Route 1 Sewer Rehab</li> <li>Route 2 Sewer Rehab</li> <li>Route 4 Sewer Rehab</li> <li>Tumon Hot Spots Sewer Rehab</li> </ul> </li> <li>Construction underway for                             <ul style="list-style-type: none"> <li>Agat-Santa Rita Sewer Rehab</li> <li>Umatac-Merizo Sewer Rehab</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>As part of the PUC Ordering Provisions, it is necessary to close this Work Authorization and open an amended Work Authorization to match the distribution of SRF funding. Below is the amended Work Authorization</li> </ul>

Table 2-1. Work Authorization Highlights

Work Authorization #	Work Authorization Title	Significant Highlights	Successes	Problems
2014-11-A1	SRF Project Management	<ul style="list-style-type: none"> <li>• Discussions with GEPA and USACOE regarding wetland concerns pertaining to Southern SSES Rehab</li> <li>• Provide assistance, on behalf of GWA, to select engineering firms performing design services for various projects</li> <li>• Address initial comments regarding permit applications from various agencies</li> <li>• Coordinate scoping meetings with selected firms for engineering design services</li> <li>• Assisted GWA in obtaining procurement documents to finalize contracts for execution with selected engineering firms for project services</li> <li>• Assisted GWA with maintaining a project management spreadsheet for EPA Grants Report to continue providing USEPA an update timeline for each SRF project</li> <li>• Participated in weekly construction meetings for Southern SSES</li> <li>• Participated in biweekly design progress meetings for Route 1 Sewer Line Rehab</li> <li>• Executed project contracts: Southern SSES Rehab - Phase I (Construction), Route 1 Sewer Line Rehab (Engineering Design), Route 2 Sewer Line Rehab (Engineering Design), D-Series Well Rehab (Construction Management)</li> <li>• Projects in procurement: Southern SSES Rehab - Phase II (Construction, Construction Management), D-Series Well Rehab (Construction), Tumon Hot Spots (Engineering Design), A-series Well Rehab (Engineering Design)</li> <li>• Assisted GWA in coordinating with design engineering firm to complete required modifications to design documents with D-Series Well Rehab</li> <li>• Worked with GWA to resolve procurement language issues in Technical Specifications</li> </ul>	<ul style="list-style-type: none"> <li>• Review and negotiated engineering design fee for RFP Route 4 Engineering Design and provided letter of recommendation for contract execution and awarded design work on Rt. 4</li> <li>• Engineering work underway               <ul style="list-style-type: none"> <li>○ Route 1 Sewer Rehab</li> <li>○ Route 2 Sewer Rehab</li> <li>○ Route 4 Sewer Rehab</li> <li>○ Tumon Hot Spots Sewer Rehab</li> </ul> </li> <li>• Construction underway for               <ul style="list-style-type: none"> <li>○ Agat-Santa Rita Sewer Rehab</li> </ul> </li> <li>• Umatac-Merizo Sewer Rehab</li> </ul>	<ul style="list-style-type: none"> <li>• Amended Work Authorization</li> </ul>
2014-12	Umatac-Merizo WWTP Water Quality Standards	<ul style="list-style-type: none"> <li>• Reviewed and scored proposals for the water quality sampling RFP</li> <li>• Identified problems with installation of staff gauges and cable monitoring system</li> <li>• Developing a solution to reinforce the staff gauges to account for river debris knocking the gauge out of alignment</li> <li>• Supported GWA on MOA between WERI and GWA</li> <li>• Supported WERI monitoring efforts and provided assistance during project kick-off</li> <li>• Conducted preliminary lagoon overflow analysis efforts</li> <li>• Conducted disinfection alternatives study</li> <li>• Worked with GWA to issue RFP for engineering services to conduct water sampling at 5 locations for a 1-year period</li> </ul>	<ul style="list-style-type: none"> <li>• Provided clarifications to WERI regarding concerns identified during monitoring efforts</li> <li>• Advertised RFP for engineering services to conduct sampling tasks</li> </ul>	

Table 2-1. Work Authorization Highlights

Work Authorization #	Work Authorization Title	Significant Highlights	Successes	Problems
2014-13	Baza Gardens Wastewater Cross-Island Design	<ul style="list-style-type: none"> <li>Limited activity occurred on this project during this period</li> <li>Reviewed Engineering Design fee proposal and offered comments for GWA's negotiation</li> </ul>	<ul style="list-style-type: none"> <li>Developed request letter to Guam DPW to obtain Cross-Island survey info</li> </ul>	<ul style="list-style-type: none"> <li>Possible issue regarding grit handling and pump rotation speed</li> </ul>
2015-05	2016 Revenue Bond Financing	<ul style="list-style-type: none"> <li>Prepared data requests and review data responses</li> <li>Participated in Finance Team calls</li> <li>Collected and gathered data for Consulting Engineers Report (CER) on water loss, sludge and chemical costs, water production rates, and expense vs revenue</li> <li>Verified and adopted data from GWA into CER</li> <li>Conducted follow up interviews</li> <li>Assisted in providing key information for rating presentations</li> <li>Addressed comments on draft CER and began final CER</li> <li>Provided certifications</li> </ul>	<ul style="list-style-type: none"> <li>Completed draft CER on schedule</li> <li>Completed and issued Final CER on schedule</li> <li>Bond sale complete</li> </ul>	
2015-07	Water Resources Master Plan Update	<ul style="list-style-type: none"> <li>Conducted scoping meeting to identify project responsibilities and develop project work plans</li> <li>Provided scoping and fee negotiations with subconsultants</li> <li>Initiated population projections and analysis for water and wastewater infrastructure</li> <li>Developed draft Project Management Plan</li> <li>Started collection of data to update water and wastewater model</li> <li>Conducted field visits and interviews with GWA operations to clarify sewer connectivity issues on existing GIS</li> <li>Updated GIS data files based on field investigations and interview with GWA</li> <li>Conducted meetings with WERI for ground and surface water development</li> <li>Attended Guam Water Resources Development Group Meeting for OneGuam</li> <li>Water Resource Specialist visited southern water and wastewater facilities</li> </ul>	<ul style="list-style-type: none"> <li>Project Kickoff</li> </ul>	

Tables 2-2 and 2-3 show the projects that were over budget by more than 10% during this quarter and projects that are behind schedule, respectively. As shown in these tables, no projects fall in these categories. All work authorizations that were performed during this period are within budget.

Table 2-2. Projects Over Budget			
Work Authorization #	Project Title	% Over Budget	Remarks
N/A	N/A	N/A	N/A

Table 2-3: Projects Behind Schedule			
Work Authorization #	Project Title	Time Behind (Mo.)	Corrective Actions
N/A	N/A	N/A	N/A

Table 2-4 shows the percent completion of major projects handled by the PMO during this period. These major projects have court ordered mandates or USEPA deadlines.

Table 2-4: Percent Completion of Major Projects			
Work Authorization #	Project Title	% Complete	Remarks
2012-14	NPDES Negotiation Support	86	Awaiting comments from USEPA on financial model. Working with Consulting Environmental Attorney on strategy for negotiations with USEPA.
2014-06	Water System Hydraulic Analysis	87	Issued Final Pressure Zone Realignment TM.
2014-10	Design Management New Agat WWTP	98	Bids received, approved and contracts issued for Phase 1 Site Preparation, Phase 2 Vertical Plant Construction, and Construction Management. Construction underway.
2014-12	Umatac-Merizo WWTP Water Quality Standards	71	Provided clarifications to WERI regarding concerns identified during monitoring efforts. Negotiated fee for engineering services to conduct sampling. Toguan River flow monitoring is underway with UOG.
2014-13	Baza Gardens WW Cross-Island Design	91	30% Conceptual Design completed. Detail Design Engineer under contract. Obtained Cross-Island survey information from Guam Department of Public Works

Table 2-5 summarizes the staff trainings that were conducted during the quarterly period. Staff trainings include operational instruction and guidance that are not formally documented as a training session or module.

**Table 2-5. Summary of Staff Training**

Date	Course Description	Instructor(s)	# of Attendees	Duration (Hrs.)
02/24/2015	Sewer Model	Andrew Fugal - Brown and Caldwell	4	2
02/25/2015	Sewer Model and GIS	Andrew Fugal - Brown and Caldwell	3	1

**Section 3.0: Summary of Hours and Fees Received by Local Contractors and PMO**

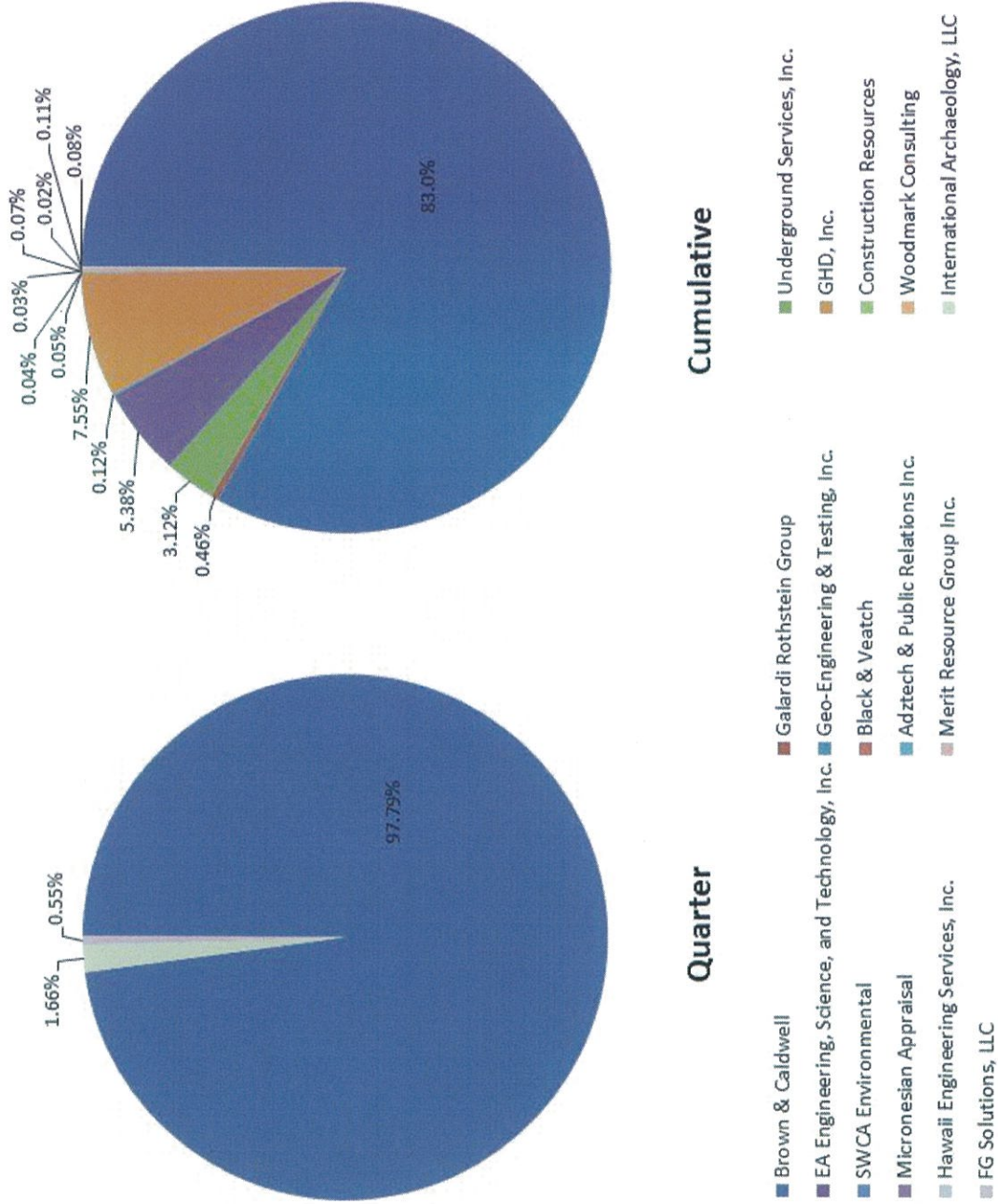
This section provides a summary of the fees invoiced by the PMO, local contractors, and subconsultants during the quarter. Table 3-1, Summary of Hours and Fees, and Figure 3-1, Percentage of Work by Firm, provides a summary of the total invoiced amount for work performed during the quarter compared to the cumulative invoiced amounts over the duration of the Program. Percentages of work performed by each subconsultant during the quarter and cumulative over program duration are also shown. GRT taxes are also depicted and represent a significant cost.

**Table 3-1. Summary of Hours and Fees**

Company	Total Billed in Quarter	Hours Worked	% of Total Billed Less Taxes for Quarter	Cumulative Billed	Cumulative %
Brown and Caldwell (PMO)*	\$808,470.35	3911.50	97.79%	\$9,192,383.48	82.83%
Galardi Rothstein Group	\$ 0.00	N/a	0.00%	\$50,579.83	0.46%
Underground Services, Inc.	\$ 0.00	N/a	0.00%	\$345,331.25	3.11%
EA Engineering, Science, and Technology, Inc.*	\$ 0.00	N/a	0.00%	\$595,732.42	5.37%
Geo-Engineering & Testing, Inc.*	\$ 0.00	N/a	0.00%	\$12,917.08	0.12%
GHD, Inc. *	\$ 0.00	N/a	0.00%	\$836,356.37	7.54%
SWCA Environmental*	\$ 0.00	N/a	0.00%	\$6,062.28	0.05%
Black & Veatch	\$ 0.00	N/a	0.00%	\$4,598.00	0.04%
Construction Resources*	\$ 0.00	N/a	0.00%	\$8,107.50	0.07%
Micronesia Appraisal*	\$ 0.00	N/a	0.00%	\$2,800.00	0.03%
Adztech & Public Relations, Inc.*	\$ 0.00	N/a	0.00%	\$2,625.00	0.02%
Woodmark Consulting	\$ 0.00	N/a	0.00%	\$12,389.93	0.11%
Hawaii Engineering Services, Inc.	\$ 0.00	N/a	0.00%	\$9,000.00	0.08%
Merit Resource Group, Inc.	\$ 0.00	N/a	0.00%	\$ 743.60	0.01%
International Archaeology, LLC	\$13,721.17	LS	1.66%	\$13,721.17	0.12%
FG Solutions, LLC	\$4,510.50	23.75	0.55%	\$4,510.50	0.04%
Taxes	\$34,448.67			\$462,447.76	
<b>Total</b>	<b>\$861,150.69</b>	<b>3,935.25</b>	<b>100%</b>	<b>\$11,560,306.17</b>	<b>100%</b>
<b>Cumulative Paid to Date</b>				<b>\$11,030,346.05</b>	<b>95%</b>

\*Local Guam Firm

Figure 3-1. Percentage of Work by Firm





#### **Section 4.0: Summary of Progress of Major Project Categories and Status**

This section provides a summary of the progress of the major project categories and the progress status of the projects.

Figure 4-1, PMO Progress by Major Project Categories describes the major project categories – General Program & Small Project Support, Water System Support, Wastewater System Support and Other Support for each quarter through the 1<sup>st</sup> Quarter of Year 5. The graph also highlights the 5-Year goal.

Figure 4-2, PMO Progress Status illustrates the anticipated spending per year of the Five-year Plan with and without the State Revolving Fund (SRF) included, the PUC approved budgets to date with SRF and the actual spending to date along with an assessment of the Program percentage completed to date.

Figure 4-1 PMO Progress by Major Project Categories

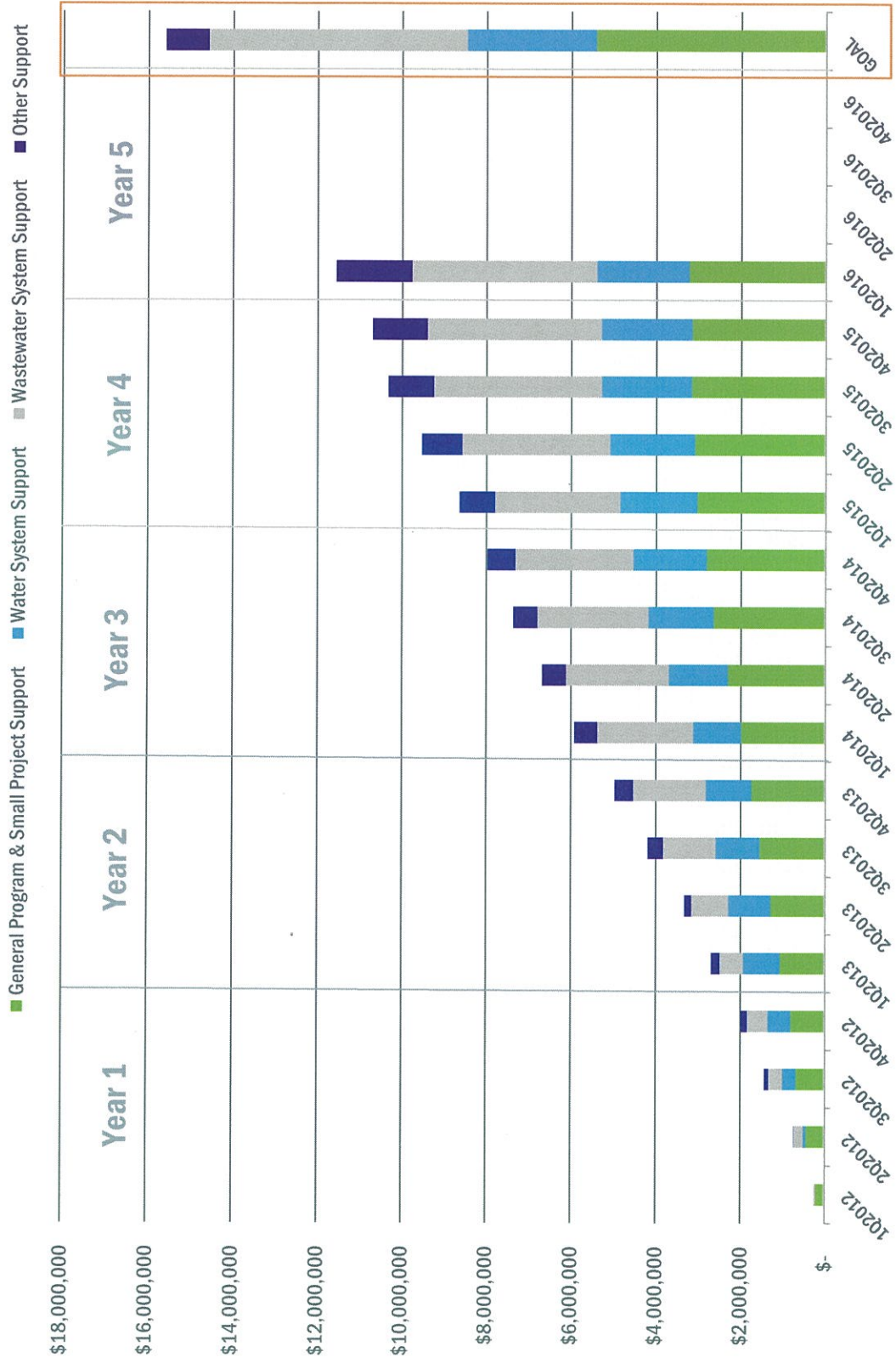
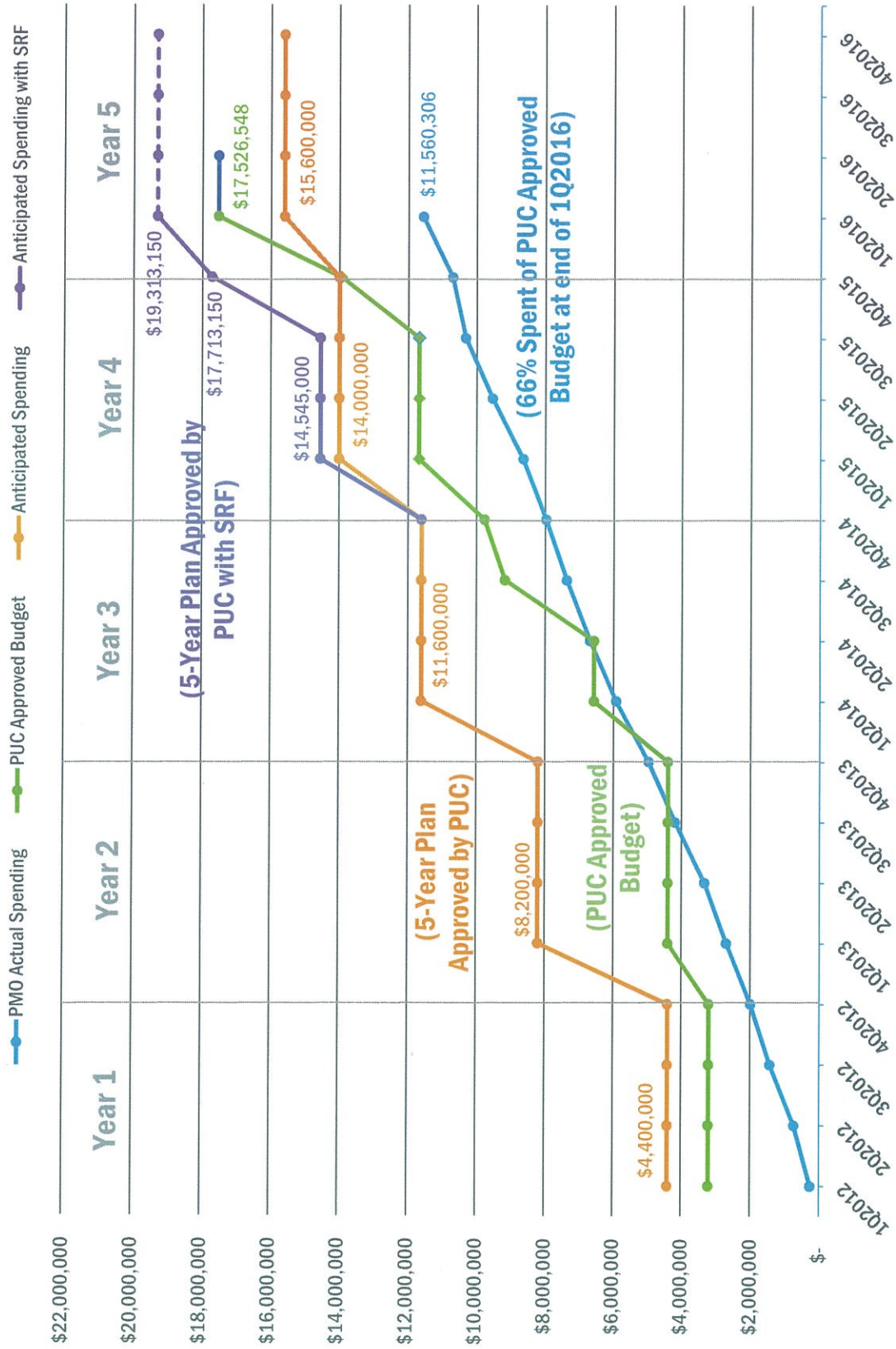


Figure 4-2 PMO Progress Status



**Section 5.0: GWA Project Bidding Process Utilizing the PMO**

Based on PUC Docket 13-01, dated July 31, 2014, Ordering Provision Number 7, an indication is required of whether certain projects managed by the PMO could be separately pursued under the competitive bidding process for all projects that are not typical management and supervisory assistance. The PMO is used primarily for technical review and subject matter knowledge, training support, and design/project/construction management support. The PMO continues to reinforce GWA's capabilities and limited manpower by identifying project needs and establishing clear scopes of work so that the design work can be openly procured from the consulting engineering community. The PMO encourages the local engineering community to participate in solving GWA's needs by acting in a supervisory project management and technical resource capacity, allowing the engineering community to do detailed design and construction management.

Projects initiated by the PMO and currently being performed by the Guam consulting engineering community as a result of open procurement are shown in Figure 5-1 below.

<b>Figure 5-1. Work Distributed to the Consulting Engineering Community</b>	
<b>Project</b>	<b>Consulting Engineer</b>
Agat-Santa Rita WWTP	GHD, Inc.
Umatac-Merizo WWTP – Toguan River Monitoring	WERI EA Engineering and Science
Baza Cross-Island Wastewater Conveyance	DCA, Inc.
Route 1 Sewer Line Rehabilitation	HDR, Inc.
Route 2 Sewer Line Rehabilitation	SSFM, Inc.
Route 4 Sewer Line Rehabilitation	AECOM
Tumon Hot Spots Sewer Line Rehabilitation	TG Engineers, Inc.
Agat-Santa Rita Sewer Line Rehabilitation	TG Engineers, Inc.
Umatac-Merizo Sewer Line Rehabilitation	TG Engineers, Inc.
D-Series Wells	EA Engineering and Science
A-Series Wells	AECOM

Figure 5-2 below provides a summary of PMO involvement with GWA's Capital Improvement Program (CIP) projects. While GWA has many active projects in the CIP, only 37.5% of the projects in the CIP have any participation by the PMO. The PMO provides technical review (TR), design management (DM), construction management (CM), and project management (PM) for 30%, 6%, 4.5%, and 3% of the total CIP projects, respectively, and several PMO services are offered on the same CIP project. The PMO's involvement on a CIP project is primarily to prepare the project for open procurement for the Engineering community on Guam.

**Figure 5-2. Plan Summary of PMO Involvement with GWA CIP**

CIP #	PROJECT DESCRIPTION	PMO Involvement		Remarks
		NO	YES	
PW 05-01	Ground Water Disinfection	●		
PW 05-03	Santa Rita Springs Booster Pump Rehab Phase II	●		
PW 05-05	"A" Series Well Transmission Line	●		
PW 05-06	Water Booster Pump Station	●		
PW 05-07	Meter Replacement Program	●		
PW 05-08	Barrigada Tank Repair/Replacement	●		
PW 05-09	Leak Detection	●		
PW 05-10	Potable Water System Planning		●	TR, TRNG
PW 05-11	Implement Ground Water Rule	●		
PW 05-12	Brigade II (Ugum Lift) BPS Upgrade	●		
PW 05-13	Deep Well Rehabilitation		●	TR
PW 05-14	New Deep Wells at Down Hard	●		
PW 05-15	Rehabilitation of Asan Springs		●	TR
PW 05-16	Master Meters		●	TR
PW 09-01	Ugum Water Treatment Plant Intake		●	TR, TRNG, CM
PW 09-02	Water Wells		●	TR, TRNG
PW 09-03	Water Distribution System Pipe Replacement and Upgrades		●	TR
PW 09-04	Pressure Zone Realignment / Development 2005 Improvements		●	TR
PW 09-06	Central Water Distribution System 2005 Improvements	●		
PW 09-08	Mechanical/Electrical Equipment	●		
PW 09-09	Water Reservoir Internal/External	●		
PW 09-10	Water Reservoir Internal/External	●		
PW 09-11	Water System Reservoirs 2005 Improvements		●	TR
PW 11-01	Distribution System Upgrade	●		
PW 11-02	Ugum Water Treatment Plant Reservoir		●	TR
PW 12-01	Water Audit Program & Water Loss Control Plan	●		
PW 12-02	Production Plan / Reduce Navy Purchases	●		
PW 12-03	Hydraulic Assessment of Tanks	●		
PW 12-04	Agana Heights & Chaot Tanks		●	TR, DM
PW 12-05	Tank Major Repair Yigo #1, Mangilao #2, Astumbo #1	●		
PW 12-06	Tank Replacement Piti & Hyundai	●		
PW 12-07	Assessment/Replacement of Malojoj Elevated & Yigo Elevated	●		
PW 12-08	Public Water System Asset Inventory/ Condition Assessment	●		
PW 12-09	Public Water System GIS & Mapping	●		
PW 14-01	Fire Hydrant Replacement Program	●		
WW 05-04	Wastewater System Planning		●	TR, DM
WW 09-01	Lift station upgrades	●		
WW 09-02	Moratorium		●	TR
WW 09-06	Wastewater Collection System Repl/ Rehabilitation		●	TR
WW 09-08	Facilities Plan/Design/Interim for Baza Gardens STP Impr.		●	TR
WW 09-10	Facilities Plan/Design/Interim for Agat-Santa Rita STP Impr.		●	TR
WW 09-11	WWTP Priority 1 Upgrades	●		
WW 11-03	Baza Gardens STP Replacement		●	TR
WW 11-04	Facilities Plan/Design/Interim for Umatac-Merizo STP Impr.		●	TR
WW 11-08	Agat/ Santa Rita STP Replacement		●	TR, DM
WW 12-01	Northern District WWTP Primary Treatment Upgrades		●	TR, CM
WW 12-02	Bio Solids Management Plan	●		
WW 12-03	Agana WWTP Interim Measures		●	TR, DM, PM, CM
WW 12-04	I&I SSES Southern		●	TR, TRNG, PM
WW 12-05	I&I SSES Central	●		
WW 12-06	I&I SSES Northern	●		
WW 12-07	Umatac Merizo STP Replacement		●	TR
WW 12-09	Wastewater Facility Back Up Power	●		
EE 05-02	SCADA Pilot Project	●		
EE 09-01	Wastewater Pumping Station Electrical Upgrade	●		
EE 09-02	Electrical Upgrade - Water Wells	●		
EE 09-03	Electrical Upgrade - Water Booster	●		
EE 09-04	Electrical Upgrade -Water Booster	●		
EE 09-05	Electrical Upgrade - Other Water	●		
EE 09-08	SCADA Improvements – Phase 3	●		
EE 09-09	SCADA Improvements – Phase 4		●	TR
MC 05-01	Laboratory Modernization	●		
MC 05-02	Land Survey	●		
MC 09-01	General Plant Improvements / Water	●		

Remarks: TR - Technical Review  
 TRNG - Training  
 DM - Design Management  
 PM - Project Management  
 CM - Construction Management

## **Section 6.0: Training Anticipated for Next Quarter**

The PMO has developed a Formal Training Plan and a Training Implementation Plan.

This Training Master Plan (TMP) describes the roadmap for formalizing a comprehensive Training Program for Guam Water-works Authority's (GWA) Engineering and Operations departments. The Implementation Plan serves as the detailed process for GWA to follow in establishing the training program. Whereas the TMP sets forth a broad approach and defines a number of organizational goals for implementing a training function at GWA, the Implementation Plan provides the details to implement a training program at GWA.

These Plans were completed and submitted to GWA Management and Human Resources. The Training Master Plan is anticipated to be executed by GWA's Human Resources Administrator and Training Specialist. Based on the Training Plan, short-term and long-term training topics will be identified and delivered throughout the next year.

## **Section 7.0: Make-up of the PMO Team**

The Program Management Team consists of Brown and Caldwell (BC) as the prime engineer supported by fifteen (15) consultants as shown in Table 3-1. The number of local residents hired by BC since 2011 -

- 2 Engineering interns, part time
- 3 Full-time Engineers

The number of BC Employees who reside locally and worked on Guam projects during the quarter -

- 5 Full-time Engineers

## **Section 8.0: Use of Local Firms**

The Ordering Provisions of the PUC, GWA Docket 13-01, dated 12/24/2014, OP #8, requires the PMO to indicate its use of local firms. Per Guam Procurement Law, 5 GCA Chapter 5, Section 5008(d), Policy in Favor of Local Procurement,

*"All procurement of supplies and services shall be made from among businesses licensed to do business on Guam and that maintain an office or other facility on Guam, whenever a business that is willing to be a contractor is:*

*(d) A service business actually in business, doing a substantial portion of its business on Guam, and hiring at least 95% U. S. Citizens, lawfully admitted permanent residents or nationals of the United States, or persons who are lawfully admitted to the United States to work, based on their citizenship in any of the nations previously comprising the Trust Territory of the Pacific Islands."*

The Brown and Caldwell Guam office is a service business, actually in business, doing business on Guam, and hiring 100% U.S. Citizens. In addition, Brown and Caldwell has maintained a Certificate of Authority (File# F-1236) to do business on Guam since January 25, 1990. Brown and Caldwell is considered a local business.

# Exhibit B

Proposed 2016 Work Authorizations (WA)  
Brown and Caldwell PMO  
July 6, 2016

		GWA Chief Engineer Input and Recommendation to Proposed Work Authorizations			
No.	Description	Fees	General description of work	Revised Fees	Comments by CE
2016-01	Agat to Umatac Potable Waterline Analysis	\$ 56,030	Analyze alternatives for a new waterline between Agat and Umatac which includes planning level cost estimates.	\$ 56,030	CCU request to review possibility of new water main from Agat to Umatac. No reduction recommended.
2016-02	Tumon Sewer Basin Investigation	\$ 187,990	GWA has engaged a few firms to conduct analysis of the sewer in the Tumon area however we have not been able to pull it all together to make better sense of the sewer system in Tumon. This WA is intended to look at the whole system and work to fill information gaps.	\$ 187,990	WA Very important to development review and planning. No reduction recommended.
2016-03	Mixing Zone Study for Agat SR WWTP Outfall	\$ 447,250	Prepare a Zone of Mixing study to be used meet the NPDES permit limits at the new WWTP which should help better determine the dilution factors at the outfall.	\$ 447,250	WA very important to overall Agat Santa Rita WWTP compliance. No reduction recommended.
2016-04	Hydraulic Modeling Phase 3	\$ 198,328	Provide continued on-call services for water hydraulic model analysis and training.	\$ 148,746	Training made still be required but I believe in-house modeling has good foundation to continue forward. Recommend to just keep hours and effort from the PMO to a limit thus the 25% reduction is recommended.
2016-05	Ground Water Well Production Meter Replacement	\$ 430,770	Conduct analysis of all production well meter configuration and performance and prepare plans to be used for improvements to meters.	\$ 301,539	Assistance is needed to better understand the water "production" by GWA to get a better account of water loss or non-revenue water. GWA however can take the lead in some aspects of the WA thus the 30% reduction is recommended.
2016-07	PM Services for Umatac-Merizo WWTP Upgrade Design	\$ 1,389,730	Provide overall project management to the Umatac Merizo WWTP improvements project as well as prepare bridging documents for DB approach.	\$ 1,250,757	Engineering capacity to handle/project management large wastewater CIP is limited at this time. There are some aspects though in the WA that can be done internally by GWA that the PMO would not spend much effort on thus the 10% reduction is recommended.
2016-08	2016 PMO Services	\$ 869,994	General Program Management Support.	\$ 782,995	WA is a capture all services to the PMO. Given GWA desire to work towards the "PMO exit" plan in the coming years I recommend we keep hour and effort from the PMO to a limit.
2016-09	Backflow Prevention and Cross Connection Control Program	\$ 154,570	Help GWA develop a Back Flow Prevention and Cross Connection Control Program	\$ 154,570	WA very important to water distribution system protection and given GWA does not have any such program now, assistance from PMO to help develop the program critical. No reduction recommended.
2014-11-A2	SRF Grant Program Support Amendment No. 2	\$ 730,000	Continue Project Management activities related to SRF funded projects. The current WA approving the PMO to provide PM did not account for the additional hours required to get projects started.	\$ 730,000	If SRF grant can funded I have no recommendation to reduce.
		<b>2016 WA's Total</b>		<b>\$ 4,464,662</b>	

Guam Waterworks Authority  
Agat to Umatac Potable Waterline Analysis

**TO:** Brown and Caldwell  
414 W. Soledad Ave  
Suite 907  
Hagatna, Guam 96910

**WORK AUTHORIZATION NO.:** 2016-01

**SUBMITTAL DATE:** May 11, 2016

**FROM:** Miguel C. Bordallo, PE  
GENERAL MANAGER  
GUAM WATERWORKS AUTHORITY

You are hereby authorized to perform the services described below in accordance with the Contract for Technical and Professional Services executed February 6, 2012 between Brown and Caldwell (BC) and Guam Waterworks Authority (GWA) for Program Management Services, GPA-RFP-11-005.

**DESCRIPTION OF WORK AND FEE ESTIMATES**

**DESCRIPTION:** Agat to Umatac Potable Waterline Analysis

Defined cost, scope and schedule on a time and materials basis are provided below and consist of analyzing alternatives for a potable water line from Agat to Umatac, developing a planning level cost estimate of each alternative, comparing each alternative using a business case evaluation, and writing a technical memorandum summarizing the analysis.

NOT TO EXCEED amount: \$ 56,030.00

Signed  Date 5/11/2016  
RAYMOND N. MATASCI  
SR. VICE PRESIDENT/PROGRAM MANAGER  
BROWN AND CALDWELL

GWA Reviewer: \_\_\_\_\_ Date \_\_\_\_\_

Signed \_\_\_\_\_ Date \_\_\_\_\_  
MIGUEL C. BORDALLO, PE  
GENERAL MANAGER  
GUAM WATERWORKS AUTHORITY



Guam Waterworks Authority  
Agat to Umatac Potable Waterline Analysis

**WORK AUTHORIZATION NO: 2016-01**

**DESCRIPTION:** Agat to Umatac Potable Waterline Analysis

**GWA PROJECT MANAGER:** Thomas F. Cruz, PE

**PROJECT BACKGROUND AND OBJECTIVE**

The purpose of this Work Authorization is to assist GWA with analyzing up to five (5) alternatives for a potable water line from Agat to Umatac, comparing each alternative using a business case evaluation and fatal flaw analysis, developing a planning level cost estimate for the top two (2) acceptable alternatives surviving the fatal flaw analysis, and writing a technical memorandum summarizing the analysis.

**SCOPE OF WORK**

This work authorization will be performed by the Brown and Caldwell PMO Team. This scope outlines the overall PMO Team scope, schedule, and budget.

**Task 1: Task Management**

**Approach:** GWA Program Management Office (PMO) staff will manage the scope, schedule, and budget associated with the work described in this Work Authorization to ensure that this work is managed in a manner that meets the intent of the GWA PMO Program Management Plan. This includes, but is not limited to, management of documents, change, risk, and quality assurance and control.

**PMO Team Responsibilities:** PMO staff will manage the scope, schedule and budget. The PMO will manage tasks in this Work Authorization in accordance with the protocols set forth in the GWA PMO Program Management Plan.

**GWA Responsibilities:** GWA staff will attend meetings, review progress reports, and adhere to the protocols set forth in the GWA PMO Program Management Plan.

**Task 2: Develop and Analyze Alternatives**

**Approach:** The PMO will develop up to five (5) alternatives to connect a potable water line from Agat to Umatac. The alternatives will be developed and analyzed in the GWA 3-D water model. Maps of each routing will be provided in pdf format from a GIS database and will list key distances and elevations.

**PMO Team Responsibilities:** The PMO will develop alternatives.

**GWA Responsibilities:** Supply information as requested. Suggest alternative alignments as necessary.

**Task 3: Business Case Evaluation**

**Approach:** The PMO will develop a business case evaluation (BCE) for each of the five alternatives. For each alternative, BC will compare advantages and disadvantages of the alignment, operation and maintenance considerations, changes in system operating pressures, flow restrictions and limitations, pipe sizes, lengths, pumping requirements, tunneling and construction requirements, service to neighborhoods, benefits and improvements to the system, water aging in the system, level of service and impacts of no service, need for pressure regulation and special pressure reducing equipment, expected risks, and other social and economic factors. Fatal flaw analyses will be conducted to narrow the alternatives. Two alternatives surviving the fatal flaw analyses will continue to Task 4.

**PMO Team Responsibilities:** Develop the BCE, conduct one teleconference workshop as necessary with GWA to work through the BCE..

**GWA Responsibilities:** Supply available information as requested. Participate in the BCE workshop.

**Task 4: Planning Level Cost Estimates**

**Approach:** The PMO will develop planning level cost estimates for each of the two alternatives that survive the fatal flaw analysis. Costs for recent GWA pipeline projects will be collected from GWA and will be used to assist in developing the cost estimates. The estimates may include rough costs for land acquisition.

**PMO Team Responsibilities:** The PMO will develop the cost estimates.

**GWA Responsibilities:** Supply available information as requested.

**Task 5: Technical Memorandum**

**Approach:** The PMO will prepare a technical memorandum (TM) documenting the BCE and fatal flaw analysis. The TM will be submitted to GWA for review and comment. At a minimum, the TM will include the following:

- Description of the development and analysis of each alternative
- Advantages and disadvantages of each alternative
- Justification for elimination of alternatives during fatal flaw analysis and justification for surviving alternatives
- Planning level cost estimates
- Results of the BCE
- Recommendations

**PMO Team Responsibilities:** The PMO will develop the TM.

**GWA Responsibilities:** GWA staff will review and comment on the TM.

Guam Waterworks Authority  
Agat to Umatac Potable Waterline Analysis

**Products:** Draft and final TMs.

**SCHEDULE**

The effort described in this task order will be completed within 10 weeks after NTP.

**BUDGET SUMMARY**

Labor (labor hours – 250)	\$53,290.00
ODC and GRT	<u>2,740.00</u>
Total	\$56,030.00

Guam Waterworks Authority  
 Agat to Umatac Potable Waterline Analysis

**BUDGET**

This work order will be performed on a time and materials basis, and will not exceed \$56,030.00 without written consent from GWA.

<b>Labor</b>				
<b>Name</b>	<b>Labor Code</b>	<b>Labor Rate</b>	<b>Hours</b>	<b>Amount</b>
Chang	L	\$ 250	16	\$ 4,000
Matasci	N	\$ 250	4	\$ 1,000
Bilz/Fugal	J	\$ 234	160	\$ 37,440
Engineer II	F	\$ 155	60	\$ 9,300
Tamai	F	\$ 155	10	\$ 1,550
<b>Labor Subtotal</b>			250	\$ 53,290
<b>Other Direct Costs</b>				
<b>Description</b>				<b>Amount</b>
Airfare (\$3000) (1x) from US Mainland				\$ 0
Rental Car \$75/day (5 days)				\$ 0
Per Diem \$250/day (5 days)				\$ 0
Equipment, copies, supplies				\$ 500
<b>ODC Subtotal</b>				\$ 500
<b>Total Work Order Estimate</b>				
<b>Labor Subtotal</b>				\$ 53,290
<b>ODC Subtotal</b>				\$ 500
<b>Subtotal</b>				\$ 53,790
<b>GRT (4.167%)</b>				\$ 2,241.43
<b>Total</b>				\$ 56,031.43

Guam Waterworks Authority  
Tumon Sewer Basin Study

**TO:** Brown and Caldwell  
414 W. Soledad Ave  
Suite 907  
Hagatna, Guam 96910

**WORK AUTHORIZATION NO.:** 2016-02

**SUBMITTAL DATE:** June 1, 2016

**FROM:** Miguel C. Bordallo, PE  
GENERAL MANAGER  
GUAM WATERWORKS AUTHORITY

You are hereby authorized to perform the services described below in accordance with the Contract for Technical and Professional Services executed February 6, 2012 between Brown and Caldwell (BC) and Guam Waterworks Authority (GWA) for Program Management Services, GPA-RFP-11-005.

**DESCRIPTION OF WORK AND FEE ESTIMATES**

**DESCRIPTION:** Phase I: Tumon Sewer Basin Study

The objective of conducting a Tumon Sewer Basin Study is to assist GWA with sewer system collection and conveyance issues in the Tumon area. This study is proposed in two phases: Phase I is an in-depth assessment of available existing Tumon Sewer Basin configuration information, limited verification field observations, and associated updates to the GWA geographic information system. Phase II fills gaps in existing data discovered in Phase I by conducting targeted fieldwork and testing, evaluating data, updating the hydraulic model and delivering a Technical Memorandum which documents overall study findings and recommendations. Also, the revised hydraulic model is for future use of GWA in capacity assessments. The defined cost, scope and schedule on a time and materials basis below are only for Phase I services.

NOT TO EXCEED amount: \$187,990.00

Signed



RAYMOND N. MATASCI  
SR. VICE PRESIDENT/PROGRAM MANAGER  
BROWN AND CALDWELL

Date

June 1, 2016

GWA Reviewer: \_\_\_\_\_

Date \_\_\_\_\_

Signed

\_\_\_\_\_  
Miguel C. Bordallo, PE  
GENERAL MANAGER  
GUAM WATERWORKS AUTHORITY

Date \_\_\_\_\_

**WORK AUTHORIZATION NO: 2016-02**

**DESCRIPTION:** Phase I: Tumon Sewer Basin Study

**GWA PROJECT MANAGER: Thomas F. Cruz, PE**

**PROJECT BACKGROUND AND OBJECTIVE**

The purpose of this Work Authorization is to perform a focused study of the Tumon Sewer Basin. This study will focus on the collection system and the Fujita Pump Station and force main and is planned in two phases: Phase I is an in-depth analysis of existing sewershed information and updating the GWA geographical information system with this information. Phase II addresses gaps in existing data encountered in Phase I by conducting targeted fieldwork and testing, evaluating data, updating the hydraulic model and delivering a Technical Memorandum documenting the findings and recommendations of this work. The scope of this proposal depicted below is only for Phase I services.

**SCOPE OF WORK**

This work authorization will be performed by the PMO Team, which is comprised of GWA, Brown and Caldwell (BC) and EA Engineering, Science, and Technology, Inc., PBC (EA) for Phase I of this study. Designated tasks are specified per the responsible member (GWA, BC or EA) in the sections below.

**Task 1: Task Management**

**Approach (BC):** GWA Program Management Office (PMO) staff will manage the scope, schedule, and budget associated with the work described in this Work Authorization to ensure that this work is managed in a manner that meets the intent of the GWA PMO Program Management Plan. This includes, but is not limited to, management of documents, change, risk, and quality assurance and control. This task shall include periodic progress conference calls or meetings between PMO and GWA personnel to review project progress, issues to be resolved, early study results, etc. This task covers efforts associated with the internal quality control and technical review process. Specifically, the PMO will conduct internal QA/QC meetings and follow-up with technical experts as necessary during the course of the project. Internal checking or peer review of all deliverables will also be performed.

**EA Responsibilities:** None.

**BC Responsibilities:** PMO staff will manage the scope, schedule and budget in accordance with the protocols set forth in the GWA PMO Program Management Plan.

**GWA Responsibilities:** GWA staff will attend meetings, review progress reports, and adhere to the protocols set forth in the GWA PMO Program Management Plan.

**Task 2: Data Gathering**

**Approach:** The PMO Team will work with GWA to collect information needed for this study, as follows:

1. *Interviews.* Interviews will be conducted with the following staff using forms with specific, consistent questions developed by GWA and the PMO Team:
  - a. BC interviewees are as follows:
    - i. GWA Operations. Operations staff will be interviewed to collect information on known issues with the collection system, pipe configurations that are not reflected in the GIS, details of unmapped pump stations, such as hotel ejector stations, and other information the operators collect during their daily work.
    - ii. GWA Engineering. Engineering staff will be interviewed to collect historical and current information available for the collection system.
    - iii. GWA GIS. GIS staff will be interviewed to discuss available piping and manhole information and record drawings.
  - b. EA interviewees are as follows:
    - i. Hotel staff. Interviews may involve discussions by GWA and the PMO Team hotel staff to understand the operating characteristics of the ejector stations (eighteen (18) hotels estimated).
    - ii. Contractors. Contractors that have worked on or studied (including condition assessment, flow metering, pipe cleaning, etc.) the Tumon Sewer basin collection system will be interviewed. This list consist of: EA Engineering, Science, and Technology, Inc., PBC; TG Engineers, PC; CDM Smith/HIES; Stanley Consultants; Detry Plumbing Service; and USI. Data and reports by the contractors will also be collected and reviewed (eight (8) contractors estimated).
2. *Existing Tumon Sewer Basin Information (EA):* The PMO Team will research (five (5) days estimated) and compile available existing Tumon Sewer Basin data and documents including, but not limited to:
  - a. Guam Tumon Basin Sewer System Inflow and Infiltration (I/I) Data
  - b. Closed-circuit television records
  - c. Sanitary sewer overflow reports
  - d. Dye testing data
  - e. Inspections
  - f. Condition assessments
  - g. Potential relevant projects of interviewed Contractors.The PMO Team may conduct up to two (2) site visits to field verify locations of system elements such as manholes, pumps and valves. The PMO Team shall only observe component locations and shall not make any adjustment to GWA equipment.
3. *Existing Tumon Sewer Basin and Fujita PS Information (BC):* The PMO Team will document observed deficiencies during interviews and field verification visits. The PMO Team may conduct up to two (2) site visits to the Fujita Pumping Station to observe operations and determine operating levels.

**EA Responsibilities:** Conduct interviews, research existing data and limited field verification of information.

**BC Responsibilities:** Conduct interviews.

**GWA Responsibilities:** Answer questions during interviews. Provide updated CCTV records, SSO reports, condition assessment and testing reports, and other relevant data and reports. Provide support during field inspections including pole camera photos, traffic control and safety, and access to view existing manholes and access to Fujita Pumping Station.

**Products:** Data collected during interviews and research.

### **Task 3: Evaluate Data**

**Approach:** The PMO Team will evaluate the information collected from Task 2 to update the GWA geographical information system (GIS) and identify data gaps, as follows:

1. *Review Interview Data.* Information collected during staff interviews will be compiled, reviewed, and evaluated for corroboration or inconsistencies with research data.
  - a. BC: GWA interviews depicted in Task 2
  - b. EA: Hotel staff and contractor interviews depicted in Task 2
2. *Review Existing Tumon Sewer Basin Information (EA and BC).* Information collected on the Tumon Sewer Basin and Fujita Pumping Station will be reviewed for quality and accuracy, as well as corroboration with one another.
3. *Update GIS Mapping (EA).* The PMO Team will assist GWA in updating the GIS mapping for the Tumon basin. This will include making estimates of how the collection system is aligned and routed throughout the basin to the Fujita PS.

**EA Responsibilities:** Evaluate the researched information, hotel staff and contractor interviews from Task 2, incorporate BC interviews and identify data gaps. Assist GWA in updating the GIS mapping for the Tumon Basin.

**BC Responsibilities:** Evaluate GWA interviews depicted in Task 2 and deliver to EA prior to closure of Task 3.

**GWA Responsibilities:** Update the GIS mapping.

**Products:** Updated GIS mapping.

### **Task 4: Technical Memorandum**

**Approach (EA):** The PMO Team will prepare a technical memorandum (TM) documenting the findings of Phase I of this study. The TM will include the following:

- Summary of interview data and existing information evaluation
- Identification of data gaps
- Identification of observed deficiencies in the collection system and pumping station



Guam Waterworks Authority  
Tumon Sewer Basin Study

- Development of a Phase II Tumon Sewer Basin Targeted Fieldwork Plan
- Compilation of gathered information
- Recommendations on plans-of-action for Phase 2 work.

**EA Responsibilities:** Deliver the TM.

**BC Responsibilities:** Review and comment on the TM.

**GWA Responsibilities:** Review and comment on the TM.

**Products:** Draft and final TMs in electronic (PDF) format, compiled information to be provided on two (2) external hard drives

**SCHEDULE**

The effort described in this task order will be completed four months from the notice to proceed.

**BUDGET SUMMARY**

Labor (labor hours – 436)	\$81,420
Subcontractor	\$93,576
ODC	\$5,475
GRT	\$7,519
<hr/>	
Total	\$187,990

Guam Waterworks Authority  
 Tumon Sewer Basin Study

**BUDGET**

This work order will be performed on a time and materials basis, and will not exceed \$187,990 without written consent from GWA.

<b>Labor</b>				
<b>Name</b>	<b>Labor Code</b>	<b>Labor Rate</b>	<b>Hours</b>	<b>Amount</b>
Chang/Gilman	M	250	96	\$24,000
Matasci/Sr. Advisor	M	250	32	\$8,000
Bilz/Fugal	H	234	60	\$14,040
Haagerson/Watson	E	140	204	\$28,560
Tamai	F	155	44	\$6,820
<b>Labor Subtotal</b>			436	\$81,420.00
<b>Other Direct Costs</b>				
<b>Description</b>				<b>Amount</b>
Airfare (\$3000) (1x) from US Mainland				\$3,000
Rental Car \$75/day (7 days)				\$525
Per Diem \$250/day (7 days)				\$1,750
Mileage				\$200
Subconsultant				\$93,576
<b>ODC Subtotal</b>				\$99,051.00
<b>Total Work Order Estimate</b>				
<b>Labor Subtotal</b>				\$81,420
<b>ODC Subtotal</b>				\$99,051
<b>Subtotal</b>				\$180,471.00
<b>GRT (4.167%)</b>				\$7,519
<b>Total</b>				\$187,990.00

Guam Waterworks Authority  
Agat-Santa Rita WWTP Mixing Zone Study

TO: Brown and Caldwell  
414 W. Soledad Ave  
Suite 907  
Hagatna, Guam 96910

WORK AUTHORIZATION NO.: 2016-03

SUBMITTAL DATE: May 17, 2016

FROM: Miguel C. Bordallo, PE  
GENERAL MANAGER  
GUAM WATERWORKS AUTHORITY

You are hereby authorized to perform the services described below in accordance with the Contract for Technical and Professional Services executed February 6, 2012 between Brown and Caldwell (BC) and Guam Waterworks Authority (GWA) for Program Management Services, GPA-RFP-11-005.

**DESCRIPTION OF WORK AND FEE ESTIMATES**

**DESCRIPTION:** Mixing Zone Study for Agat-Santa Rita WWTP Discharge Outfall 001 to Titalao Bay of the Philippine Sea

Defined cost, scope and schedule on a time and materials basis are provided in the attached proposal letter and consist of providing engineering and technical support for the Water and Wastewater Capital Improvements Projects for GWA.

NOT TO EXCEED amount: \$447,250.00.

Signed



RAYMOND N. MATASCI  
SR. VICE PRESIDENT/PROGRAM MANAGER  
BROWN AND CALDWELL

Date 5/17/2016

GWA Reviewer:

THOMAS F. CRUZ, P.E.  
CHIEF ENGINEER

Date \_\_\_\_\_

Signed

MIGUEL C. BORDALLO, P.E.  
GENERAL MANAGER  
GUAM WATERWORKS AUTHORITY

Date \_\_\_\_\_

Guam Waterworks Authority  
Agat-Santa Rita WWTP Mixing Zone Study

**WORK AUTHORIZATION NO:** 2016-03

**DESCRIPTION:** Mixing Zone Study for Agat-Santa Rita WWTP Discharge Outfall 001 to  
Tipalao Bay of the Philippine Sea

**GWA PROJECT MANAGER:** Thomas F. Cruz, PE

### **PROJECT BACKGROUND AND OBJECTIVE**

The purpose of this task order is to provide project management, scientific and engineering support, and technical advice for a study of the potential dilution zone at the Discharge Outfall 001 in Tipalao Bay. This Zone of Mixing (ZOM) study will be used to meet the NPDES permit limits at GWA's new Agat-Santa Rita WWTP. The project outcome will determine the dilution factors for chronic toxicity limits assuring that the new WWTP can meet permit requirements. This work authorization is also intended to provide training and mentoring for GWA personnel, so that technical knowledge can be transferred through projects execution. This will be done through a workshop conducted to explain the ZOM study upon completion of the draft Dilution Analysis Study Plan.

The PMO will assist GWA by providing a highly-qualified managerial and technical support team that covers management, engineering, and scientific disciplines from project initiation to completion. This team shall be regularly available for resolution of critical issues, preparation and interpretation of reports, regulatory reviews and addressing regulatory comments, and specialized assistance in explaining the methods and results of the study to the Guam EPA, USEPA, Department of Defense, and GWA reviewers.

This authorization outlines the overall PMO Team scope, schedule, and budget.

### **SCOPE OF WORK**

The scope of work includes project management, scientific and engineering technical support, meetings, reporting and training. Public Outreach is not included in the scope.

#### **Task 1: Task Management**

**Approach:** PMO staff will provide ongoing project management services throughout the duration of the project. Project management will include ongoing communication and project coordination with GWA, providing resources to meet the project scope, detailed schedule development, project budget tracking and invoicing, and managing the project team. It will also include the development of internal site-specific safety plans for the field study.

The PMO will provide Quality Assurance/Quality Control (QA/QC) throughout the duration of the project. Monthly project status summaries will be provided. PMO staff will manage the scope, schedule, and budget associated with the work described in this Work Authorization to ensure that this work is managed in a manner that meets the intent of the GWA PMO Program Management Plan. This includes, but is not limited to, management of documents, change, risk, and quality assurance and control. The PMO will effectively manage the project team members and perform administrative tasks for the projects to produce a quality product within budget and

Guam Waterworks Authority  
Agat-Santa Rita WWTP Mixing Zone Study  
schedule.

**PMO Team Responsibilities:** PMO staff will manage the scope, schedule and budget. The PMO lead will manage tasks in this Work Authorization in accordance with the protocols set forth in the GWA PMO Program Management Plan.

**GWA Responsibilities:** GWA staff will attend meetings, review progress reports, and adhere to the protocols set forth in the GWA PMO Program Management Plan.

**Products:** Status reports; scope, schedule, and budget updates, as necessary.

### **Task 2: Meetings and Reporting**

**Approach:** PMO staff will attend joint meetings with GWA based on project progress, regulatory updates and issue resolution to a maximum of once per month through the duration of the work authorization.

**PMO Team Responsibilities:** The PMO staff will attend meetings and develop minutes of meetings, monthly progress and status reports as necessary.

**GWA Responsibilities:** GWA project team will coordinate meetings, and attend project status meetings.

**Deliverable:** Meeting minutes, progress and status reports as necessary.

### **Task 3: Prepare Detailed Study Plan**

**Approach:** The PMO Team will prepare a detailed Zone of Mixing (ZOM) Dilution Analysis Study Plan. The Plan will proceed upon:

- 1) Reviewing the work plans and reports prepared by others and previously submitted to the Guam EPA, NAVFAC Marianas, USEPA and other agencies;
- 2) Reviewing NPDES requirements and site conditions;
- 3) Reviewing appropriate locations for instrumentation storage and laboratory testing,
- 4) Reviewing as-built information on the outfall diffuser, and
- 5) Reviewing and incorporating findings from site visits performed by the PMO Team during design of the new Agat-Santa Rita WWTP in 2015 and during preparation of this study Plan. The ZOM dilution analysis detailed study plan will provide specific details describing what and how specific tasks will be performed, what support or services will be expected of GWA, and the expected testing period dates and daily activities during the testing.

An outline of the proposed study plan is listed below:

- Section 1: Introduction
  - 1.1 Purpose and Objectives
  - 1.2 Background

Guam Waterworks Authority  
Agat-Santa Rita WWTP Mixing Zone Study

- Section 2: Plan of Study
- 2.1 Approach Overview
  - 2.2 Field Procedures and Measurements
    - 2.2.1 Dye Tracer
    - 2.2.2 Dye Tracer Injection
    - 2.2.3 Outfall Dye Monitoring and Sampling
    - 2.2.4 Receiving Water Measurements
    - 2.2.5 Fluorometer Calibrations
    - 2.2.6 Meteorological Measurements
    - 2.2.7 Tide Level
    - 2.2.8 Safety Issues
    - 2.2.9 Receiving Water Data Analysis
  - 2.3 Dilution Modeling
  - 2.4 Reporting

Section 3: Contact Information

Section 4: Field Schedule and GWA Support Expectations

Section 5: Field Work Safety Plan

**PMO Team Responsibilities:** PMO staff will develop and write the study plan in cooperation with GWA and issue the plan for GWA review and approval prior to initiating field work.

**GWA Responsibilities:** GWA staff will provide oversight and attend meetings, review memos and reports, review and approve the study plan.

**Products:** ZOM dilution analysis study plan.

**Task 4: Preparation for Field Work**

**Approach:** This task includes activities associated with preparing for the dilution field study.

This effort includes team communications and coordination and the preparation, transport, setup, and testing of all equipment and instrumentation required to perform the study. A significant percentage of this task will be performed off site prior to mobilization of staff and shipping of equipment. For budgeting and scheduling purposes, three days have been allocated for a team of 4 to perform setup and instrument testing on-site. We have also anticipated the need to have two ocean-worthy boats and operators available for installing instrumentation and deploying offshore instrumentation prior to the start of the test. Key task elements include the following:

1. Maintain communications with project team, GWA staff, and WWTP operators to coordinate schedule, responsibilities and verify expectations. WWTP operators will include both GWA staff and the Department of Navy staff, or contractors, for the Apra

Guam Waterworks Authority  
Agat-Santa Rita WWTP Mixing Zone Study

Harbor WWTP.

2. Coordinate external resources and logistics, i.e. boats and operators. Monitor weather and sea forecast information to verify acceptable test conditions.
3. Obtain access from Dept. of Navy for entry to the Navy Base for full duration of the field work.
4. Prepare instrumentation and equipment required to perform the field study. Pack and ship instrumentation to Guam, provide temporary storage, and transport to the study site.
5. Mobilize field staff.
6. Perform on-site setup of equipment and instrumentation onshore and offshore. Test and verify the operation of injection and monitoring systems. Setup temporary laboratory space at the Agat-Santa Rita WWTP or other location as determined by GWA (Agana WWTP, Northern District WWTP, Dededo Laboratory, etc.). Prepare dye standards and calibrate fluorometers. Install temporary weather tower at the WWTP or other location deemed appropriate by the PMO Team.
7. Setup water quality and dye profiling equipment and instrumentation on survey boat. Test boat mounted instrumentation.
8. Deploy bottom mounted ADCPs in the vicinity of the outfall diffuser. Deploy continuous dye monitoring systems at fixed offshore locations along the ZOM boundary.

**PMO Team Responsibilities:** PMO staff will perform duties outlined above in the Approach. The PMO anticipates the use of senior, experienced engineers, scientists and operators for technical advice as required, and staff engineers and scientists for related activities throughout the duration of the project.

**GWA Responsibilities:** GWA staff will provide oversight and assistance as needed, provide documentation necessary for access to the Navy Base, provide access to a temporary laboratory space, provide temporary storage for instrumentation, attend meetings, review progress reports, and provide assistance for the continual dye monitoring during the 36-hour field test.

**Products:** Meeting minutes, memos, and reports as necessary.

**Task 5: Conducting the Dilution Study Field Work**

**Approach:** This task is to perform the dilution study field work consistent with the final work plan. This effort starts after the completion of on-site setup and installation tasks. The dye tracer field study will consist of a continuous release of a non-toxic fluorescent dye into the WWTP effluent outfall followed by subsequent intensive, repeated measurements of dye and water properties in the receiving waters in the vicinity of the outfall diffuser and ZOM. The dye survey will be conducted over a two day period and the tracer will be injected into the effluent continuously for up to 36 hours at a rate proportional to effluent flow to maintain a constant concentration of dye being discharged. The outfall effluent dye concentration will be monitored and recorded by instrumentation installed at either the Ga'an Pumping Station or the Tupalao Pumping Station as determined by field investigation. In addition to the instrumentation, periodic grab samples will be collected for analysis using a bench-top fluorometer for the purpose of calibrating the continuous measurements.

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While the dye is being released during daylight hours, distinct sets of near-synoptic receiving water dye and water property measurements will be recorded for the purpose of mapping and quantifying the discharge plume dilution centered at the time of specific tidal stages. Receiving water measurements will consist of high resolution vertical profiles measured from aboard a survey boat along transects spaced at varying distances from the diffuser. Water property measurements will include temperature, salinity, the water depth the measurements were taken, the bottom depth at the measurement location, and profiles of current velocity and direction. Continuous receiving water dye measurements will be recorded during the dye release at three fixed monitoring locations along the edge of the ZOM. Monitoring buoys will be deployed for this purpose prior to the start of the injection. Continuous current measurements will be recorded in the vicinity of the diffuser by means of a bottom mounted Acoustic Doppler Current Profiler (ADCP), also installed prior to the injection start. Currents will also be measured during the dye release by means of drifters (drogues) released over the diffuser and tracked from aboard the survey boat, and by means of a boat mounted ADCP for recording current profiles along transects during plume dye tracking.

We have anticipated that the field testing will require two long days for four staff, plus boat and operator.

**PMO Team Responsibilities:** PMO staff will perform duties outlined above in the Approach.

**GWA Responsibilities:** GWA staff will provide assistance as needed for the continual dye monitoring during the 36-hour field test.

**Deliverable:** Field data measurements, dye concentrations, grab sample analysis, velocities and currents.

**Task 6: Dilution Modeling and Calibration**

**Approach:** Outfall and diffuser hydraulic modeling will be performed consistent with the final Work Plan. Several hydraulic models will be used in an effort to replicate observed conditions and the most promising model or models will be calibrated using the results of the field study for simulation of near-field (initial dilution) and far-field (subsequent dilution) rates. Modeling will be performed to predict net dilution at the ZOM boundaries and simulate conditions anticipated to occur under different seasonal or effluent discharge conditions.

**PMO Team Responsibilities:** PMO staff will perform duties outlined above in the Approach.

**GWA Responsibilities:** GWA will review hydraulic modeling results.

**Deliverable:** Hydraulic modeling and mapping results.

**Task 7: Dilution Study Reporting**

**Approach:** A draft and Final ZOM dilution analysis report will be prepared with a summary section and presentation of field test data and modeling results. The report will include a description of the study procedures, methods, and instrumentation. Process field data and



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sporting information will be presented in a series of maps, plots, and tables. Graphics will include contour maps showing the dye distribution in vertical and horizontal cross-section and bottom depth maps and cross-sections. Dilution plots will be prepared depicting dilution versus distance from the outfall diffuser with particular emphasis regarding the dilutions on the ZOM boundary.

Time history plots will include effluent discharge flow rates and discharge dye concentration, and continuous monitoring plots for offshore stations. Additional data and graphics will present wind, tide and current data as well as field observations of surf conditions. Diffuser hydraulics and modeling runs will be summarized in tables and graphics showing the comparison of field measurement and model results predicted under various effluent flow and receiving water scenarios.

**PMO Team Responsibilities:** The PMO staff will prepare a draft and final ZOM dilution analysis report illustrated with mapping, plots, tables and results.

**GWA Responsibilities:** GWA will review the final report and offer comments. GWA will prepare the report for submittal to the USEPA and Guam EPA as part of their NPDES water quality compliance information.

**Deliverable:** Draft and Final ZOM dilution analysis report.

**Task 8: Workshop Training on Interpretation of Dilution Study Results**

**Approach:** The PMO Team will conduct one (1) workshop with GWA to explain the results of the ZOM dilution analysis report. The workshop may be conducted by teleconference.

**PMO Team Responsibilities:** Prepare for, arrange, and conduct the workshop.

**GWA Responsibilities:** GWA will attend the workshop and arrange for a venue at the GWA Fadian complex.

**Deliverable:** ZOM dilution analysis and results workshop.

**ASSUMPTIONS**

For the purpose of this proposal, the following assumptions were made:

- Off-hour access to the Agat-Santa Rita WWTP will be made available during setup and testing.
- Access to the Navy's Apra Harbor WWTP and Base access will be allowed through GWA's correspondence with the Dept. of Navy.
- Temporary secure storage space will be provided by GWA for instrumentation shipping containers and miscellaneous equipment throughout the field work testing period.
- Temporary laboratory space will be provided by GWA. Minimum requirements include sink and wet counter space.
- Public notification will be handled by the GWA. The release of the dye tracer may result in a faint visible red plume that may catch the attention of the public. It will be useful if

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Agat-Santa Rita WWTP Mixing Zone Study**

agencies that typically receive inquiries or calls from the public are aware of the study, and that information about the study is advertised and posted in advance in specific locations where there is increased chance of sightings. GWA, through the Public Information Officer, will provide information to the public in advance of the field work testing.

- On-water survey work will be performed during fair weather when surface water mixing due to wind-driven wave action would be minimal.
- The project is not delayed or severely impacted by typhoon or other heavy storm system

**EXCLUSIONS**

The following tasks are not included in this work:

- Project procurement
- Design documents that will be used for construction

**SCHEDULE**

The PMO Team would be able to commence work immediately upon receiving a written Notice to Proceed (NTP). The draft detailed Study Plan will be submitted within five (5) weeks after the NTP with the Final Study Plan following within two (2) weeks after receipt of comments from GWA. Adjustments to these expectations may be impacted by whether or not comments are received from USEPA or Guam EPA and the final Study Plan may be subject to further amendment prior to the actual testing. It is at GWA's discretion as to whether the draft Zone of Mixing (ZOM) Dilution Analysis Study Plan will be submitted to the regulators for comment.

The field study is tentatively planned to be performed during the months of September through October 2016. A Draft Technical Memorandum will be submitted 12 weeks following completion of the Field Study. The anticipated submittal and study dates do not include significant changes or other delays beyond the control of the PMO Team.

The scope of services described in this work authorization is expected to be completed by January 31, 2017.

**BUDGET SUMMARY**

Labor (Labor Hours –1557)	\$ 241,682.00
ODCs	187,677.00
<u>GRT</u>	<u>17,891.00</u>
Total	\$ 447,250.00

Task 1: Task Management	\$ 30,111.00
Task 2: Study Plan	19,252.00
Task 3: Preparation for Field Work	37,746.00
Task 4: Conducting the Dilution Study Field Work	248,704.00
Task 5: Data Processing, Dilution Modeling and Calibration	53,184.00
Task 6: Dilution Study Reporting	58,254.00

**Guam Waterworks Authority  
Agat-Santa Rita WWTP Mixing Zone Study**

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Guam Waterworks Authority  
 Agat-Santa Rita WWTP Mixing Zone Study

**BUDGET**

This work order will be performed on a time and materials basis and will not exceed \$447,250.00 without written consent from GWA.

<b>Labor</b>			
<b>Name</b>	<b>Labor Rate</b>	<b>Hours</b>	<b>Amount</b>
Chang	250	96	\$ 24,000
Ono	250	9	2,250
McDonald	234	374	87,516
Sr. Engineer	155	314	48,670
Principal Engineer A	185	48	8,880
Engineer I	100	446	44,600
Admin/PA	120	10	1,200
Sr. Admin	155	90	13,950
Gilman	250	20	5,000
Bilz	234	24	5,616
Labor Subtotal			\$ 241,682
<b>Other Direct Costs</b>			
<b>Description</b>	<b>Amount</b>		
Airfare	\$ 6,000		
Lodging and Per Diem	5,250		
Car/Truck Rental	1,050		
Equipment Rental	16,275		
Subconsultant Services	126,340		
Mileage	162		
Shipping	23,500		
Miscellaneous	500		
Field Supplies	8,600		
ODC Subtotal			\$187,677.00
<b>Total Work Order Estimate</b>			
Labor Subtotal			\$ 241,682
ODC Subtotal			187677
GRT (4.167%)			17,891
Total			\$447,250.00

Guam Waterworks Authority  
Hydraulic Modeling Phase 3

**TO:** Brown and Caldwell  
414 W. Soledad Ave  
Suite 907  
Hagatna, Guam 96910

**WORK AUTHORIZATION NO.:** 2016-04

**SUBMITTAL DATE:** May 11, 2016

**FROM:** Miguel C. Bordallo, PE  
GENERAL MANAGER  
GUAM WATERWORKS AUTHORITY

You are hereby authorized to perform the services described below in accordance with the Contract for Technical and Professional Services executed February 6, 2012 between Brown and Caldwell (BC) and Guam Waterworks Authority (GWA) for Program Management Services, GPA-RFP-11-005.

**DESCRIPTION OF WORK AND FEE ESTIMATES**

**DESCRIPTION:** Hydraulic Modeling Phase 3

Defined cost, scope and schedule on a time and materials basis are provided below and consist of assisting GWA with potable water system storage, conveyance and distribution issues on an on-call basis, which will include addressing specific concerns in the water system and developing solutions using the model; and updating areas in the model that need to be developed and calibrated.

NOT TO EXCEED amount: \$ 198,328.

Signed



RAYMOND N. MATASCI  
SR. VICE PRESIDENT/PROGRAM MANAGER  
BROWN AND CALDWELL

Date

5/11/2016

GWA Reviewer: \_\_\_\_\_

Date \_\_\_\_\_

Signed

\_\_\_\_\_  
MIGUEL C. BORDALLO, PE  
GENERAL MANAGER  
GUAM WATERWORKS AUTHORITY

Date \_\_\_\_\_

**WORK AUTHORIZATION NO: 2016-04**  
**DESCRIPTION:** Hydraulic Modeling Phase 3  
**GWA PROJECT MANAGER:** Thomas Cruz

**PROJECT BACKGROUND AND OBJECTIVE**

The purpose of this Work Authorization is to assist GWA with water system issues on an on-call basis, which will include addressing specific concerns in the water system and developing solutions using the model; and updating areas in the model that need to be developed and calibrated. GWA intends to continue to use water modeling results for long-term planning to grow and improve the water system.

**SCOPE OF WORK**

This work authorization will be performed by the Brown and Caldwell PMO Team. This scope outlines the overall PMO Team scope, schedule, and budget.

**Task 1: Task Management**

**Approach:** GWA Program Management Office (PMO) staff will manage the scope, schedule, and budget associated with the work described in this Work Authorization to ensure that this work is managed in a manner that meets the intent of the GWA PMO Program Management Plan. This includes, but is not limited to, management of documents, change, risk, and quality assurance and control. This task shall include periodic progress conference calls or meetings between PMO and GWA personnel to review project progress, issues to be resolved, early study results, etc. This task covers efforts associated with the internal quality control and technical review process. Specifically, the PMO will conduct internal QA/QC meetings and follow-up with technical experts as necessary during the course of the project. Internal checking or peer review of all deliverables will also be performed.

**PMO Team Responsibilities:** PMO staff will manage the scope, schedule and budget in accordance with the protocols set forth in the GWA PMO Program Management Plan.

**GWA Responsibilities:** GWA staff will attend meetings, review progress reports, and adhere to the protocols set forth in the GWA PMO Program Management Plan.

**Task 2: On-Call Model Assistance**

**Approach:** The PMO will assist GWA with water system issues, which will include addressing specific concerns in the water system and developing solutions using the model. Examples of typical assistance include:

- Implementation of the pressure zone realignment plan. For example, BC recently developed a preliminary plan for realigning the pressure zone for the area served by the Hyundai tank. This plan was further developed by another Engineering consultant. GWA then requested that BC review the consultant's plans.
- Take existing storage tanks offline for inspection or abandonment

Guam Waterworks Authority  
Hydraulic Modeling Phase 3

- Place new storage tanks in service
- Analyze available fire flow. For example, BC analyzed the system and developed solutions for serving fire flow to GWA's new meter testing building in Harmon Industrial Park.
- Develop plans to increase fire flow storage in high population villages
- Analyze new developments and hotels. For example, BC recently analyzed the system to see if the new hotels Nikko Guam and Dusit Thani could be served and gave recommendations for serving the new hotels.
- Analyze water system piping. For example, GWA recently requested that BC assist in analyzing how to serve the Tiyan Donut Hole area off of Route 8.
- Conduct other analyses for growth, development, efficiency optimization, and maintenance

**PMO Team Responsibilities:** The PMO will analyze the model and generate results for use by GWA. Prepare Tech Memos as outlined below.

**GWA Responsibilities:** Supply information as requested. Review results and recommendations prepared by the PMO and offer comments and opinions.

**Task 3: Technical Memoranda**

**Approach:** The PMO will prepare technical memoranda (TM) documenting each analyses and evaluation requested by GWA. The TMs will be submitted to GWA for review and comment. At a minimum, the TMs will include the following:

- Description of the model update including the modeling methodology and assumptions
- Description of the model analyses and findings
- Figures, including maps and graphs, to support the findings and recommendations
- Other supporting documentation

**PMO Team Responsibilities:** The PMO will develop the TMs. The PMO will also submit the updated model to GWA's designated person responsible for the model.

**GWA Responsibilities:** GWA staff will be required to review and comment on the TMs.

**Products:** Draft and final TMs.

**Task 4: Data Gathering and Fieldwork**

**Approach:** The PMO will work with GWA to collect data to update portions of the model that need to be updated. Data gathering and fieldwork that will be done for this task will include the following:

1. *Interviews.* Interviews will be conducted with GWA staff to collect information on system piping and operations. The interviews will be done up to the budgeted number of hours. This task will include meeting with the following staff:
  - a. Staff involved in the leak detection program. After talking to staff involved in the leak detection, BC discovered that the GIS is incorrect along Route 8 where GWA was investigating connecting the Tiyan Donut Hole area. The leak detection staff

Guam Waterworks Authority  
Hydraulic Modeling Phase 3

- have knowledge of the actual piping not shown in GIS. This information will be lost as the staff retire or leave GWA. These staff will be interviewed to collect information on correct piping in key areas of the system.
- b. **Operations staff.** The operations staff have knowledge of piping obtained during their daily field work that is not reflected in the GIS. These staff will also be interviewed to collect information on correct piping in key areas of the system.
  - c. **GSI staff.** GIS and Engineering staff have knowledge of what is included in GIS and what remains to be added based on a backlog of field collected data.
2. **Fieldwork Plan.** The PMO will prepare a fieldwork plan and will submit it to GWA for review. The plan will identify locations for field tests to gather data to calibrate the model. The locations to be tested include locations that are currently not well calibrated in the model. For example, the Tumon area is not well calibrated in the model due to discrepancies in field data collected previously for the area. For that area, the plan will identify locations at the inflow and outflow areas into Tumon and the timing for doing the field work.
3. **Perform Fieldwork.** As instructed by GWA, the PMO will assist GWA in performing fieldwork. It is assumed that the fieldwork will include:
- a. **Pressure Loggers.** Pressure loggers will be placed at key locations to measure pressures over a set period. This will include at storage tanks to capture tank levels over several weeks and at important points such as along the key inflow and outflow points to Tumon.
  - b. **Fire Flow Tests.** Fire flow tests will be done by flowing a hydrant and gathering residual pressures at nearby locations. Tests will be done in strategic locations within the pressure zones and at PRVs. For example, fire flow tests done at the choked valves and PRVs in and out of Tumon can be done in conjunction with the pressure loggers to see how the system reacts to peak flows.
  - c. **Gather Additional Pressures, Flows, and Tank Levels.** Additional monitoring equipment will be placed as necessary to collect data from master meters and instantaneous pressures from pressure gauges.

**PMO Team Responsibilities:** Conduct interviews, developed a fieldwork plan, and work with GWA staff in performing fieldwork. The PMO will supply equipment if necessary for testing to supplement GWA's equipment.

**GWA Responsibilities:** Answer questions during interviews, review the fieldwork plan, and assist in performing fieldwork. GWA will be responsible for supplying any tools and equipment required for operation of system facilities, such as valve and hydrant wrenches. GWA will perform installation of pressure gauges as needed.

**Products:** Data gathered from interviews, fieldwork plan, and data collected during fieldwork.

### **Task 5: Update Hydraulic Model**

**Approach:** The latest GWA water model will be updated using the following steps:



Guam Waterworks Authority  
Hydraulic Modeling Phase 3

1. *Update GIS.* The PMO will assist in updating the GIS to be used in the model up to the budgeted number of hours. The GIS will be updated using data collected during Task 4, including for piping corrections based on interviews with operations staff.
2. *Update Model Piping.* The updated GIS will be imported into the model and the model piping will be updated to match the GIS piping.
3. *Update Model Facilities.* The model facilities will be updated using data collected during Task 4. The model facilities will include storage tanks, booster pumps, wells, PRVs, and isolation valves.
4. *Calibrate Model.* The model will be calibrated using the data collected during the fieldwork. The calibration will focus on areas that are not currently well calibrated in the model. For example, the data collected for the Tumon area will be used to modify model operations, choked valve settings, and PRV settings to better simulate the Tumon area.

**PMO Team Responsibilities:** Update the model using the latest information.

**GWA Responsibilities:** Supply information as requested.

**Products:** Updated model.

**Task 6: Hydraulic Model Training and Sharing**

**Approach:** The latest GWA water model will be used for one training exercise class for GWA staff. Training for the class will occur on Guam or by teleconference based on GWA's needs. The model may be shared with other Engineering consultants at the request and approval of GWA. Documentation will be written to give to Engineering consultants in using the model. Important user instructions will be discussed by teleconference with the approved Engineering consultants.

**PMO Team Responsibilities:** Prepare for and provide one training class for GWA.

**GWA Responsibilities:** Provide venue and necessary facilities for training as requested. Provide approvals and directions for consultants desiring to use the updated hydraulic model.

**Products:** Training class.

**SCHEDULE**

The effort described in this task order will be completed by July 31, 2017.

**BUDGET SUMMARY**

Labor (labor hours – 864)	\$174,384
ODC and GRT	23,536
<hr/>	
Total	\$198,328

Guam Waterworks Authority  
Hydraulic Modeling Phase 3

Guam Waterworks Authority  
Hydraulic Modeling Phase 3

**BUDGET**

This work order will be performed on a time and materials basis, and will not exceed \$185,900 without written consent from GWA.

<b>Labor</b>				
<b>Name</b>	<b>Labor Code</b>	<b>Labor Rate</b>	<b>Hours</b>	<b>Amount</b>
Chang	L	\$ 250	40	\$ 10,000
Gilman	M	\$ 250	20	\$ 5,000
Liechty	M	\$ 250	20	\$ 5,000
Bilz	J	\$ 234	60	\$ 14,040
Fugal	J	\$ 234	356	\$ 83,304
Engineer II	F	\$ 155	328	\$ 50,840
Tamai	F	\$ 155	40	\$ 6,200
<b>Labor Subtotal</b>			864	\$ 174,384
<b>Other Direct Costs</b>				
<b>Description</b>				<b>Amount</b>
Airfare (\$3000) (3x) from US Mainland				\$ 9,000
Rental Car \$75/day (18 days)				\$ 1,350
Per Diem \$250/day (21 days)				\$ 5,250
Equipment				\$ 500
<b>ODC Subtotal</b>				\$ 16,100
<b>Total Work Order Estimate</b>				
<b>Labor Subtotal</b>				\$ 174,384
<b>ODC Subtotal</b>				\$ 16,100
<b>Subtotal</b>				\$ 190,394
<b>GRT (4.167%)</b>				\$ 7,934
<b>Total</b>				\$ 198,328

Guam Waterworks Authority  
Groundwater Well Production Meter Replacement

**TO:** Brown and Caldwell  
414 W. Soledad Ave  
Suite 907  
Hagatna, Guam 96910

**WORK AUTHORIZATION NO.:** 2016-05

**SUBMITTAL DATE:** June 1, 2016

**FROM:** Miguel C. Bordallo, PE  
GENERAL MANAGER  
GUAM WATERWORKS AUTHORITY

You are hereby authorized to perform the services described below in accordance with the Contract for Technical and Professional Services executed February 6, 2012 between Brown and Caldwell (BC) and Guam Waterworks Authority (GWA) for Program Management Services, GPA-RFP-11-005.

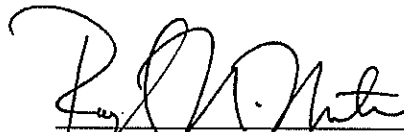
**DESCRIPTION OF WORK AND FEE ESTIMATES**

**DESCRIPTION:** Engineering for Groundwater Well Production Meters

Defined cost, scope and schedule on a time and materials basis are provided in the attached proposal letter and consist of providing engineering and technical support for the Water and Wastewater Capital Improvements Projects for GWA.

NOT TO EXCEED amount: \$430,770.00

Signed



RAYMOND N. MATASCI  
SR. VICE PRESIDENT/PROGRAM MANAGER  
BROWN AND CALDWELL

Date June 1, 2016

GWA Reviewer:

\_\_\_\_\_  
THOMAS F. CRUZ, P.E.  
CHIEF ENGINEER

Date \_\_\_\_\_

Signed

\_\_\_\_\_  
MIGUEL C. BORDALLO, P.E.  
GENERAL MANAGER  
GUAM WATERWORKS AUTHORITY

Date \_\_\_\_\_

Guam Waterworks Authority  
Groundwater Well Production Meter Replacement

**WORK AUTHORIZATION NO:** 2016-05

**DESCRIPTION:** Engineering for Groundwater Well Production Meters

**GWA PROJECT MANAGER:** Thomas F. Cruz, PE

### **PROJECT BACKGROUND AND OBJECTIVE**

GWA suffers from a lack of accurate recording of the volume of groundwater production at many of the existing groundwater wells. This is causing GWA to under- or over-report water production which affects non-revenue water calculations. Further, without accurate meter readings at the groundwater wells, it is difficult to track leakage and water loss.

The purpose of this project is to field verify production meter performance and develop bid-ready plans and specifications to replace under-performing and failed production flow meters at GWA groundwater well sites. The plans and specifications will be used by GWA to obtain competitive cost proposals from qualified contractors to perform meter replacement work at each of the identified groundwater well sites. Existing meters may also be incorrectly installed, causing significant inaccuracies in volume and flow recording.

The PMO will assist GWA by providing a highly-qualified managerial and technical support team that will deliver project management and engineering services from project initiation to completion. This team will be regularly available for resolution of critical issues, interpretation of plans and specifications, and addressing regulatory comments, if necessary.

This authorization outlines the overall PMO Team scope, schedule, and budget.

### **SCOPE OF WORK**

The scope of work includes project management, engineering, plans and specifications development, engineering technical support, meetings, and the associated reporting. Public outreach is not included in the scope.

#### **Task 1: Task Management**

**Approach:** PMO staff will provide ongoing project management services throughout the project duration. Project management will include ongoing communication and project coordination with GWA, providing resources to meet the project scope, schedule development, project budget tracking and invoicing, and managing the project team. It will also include the development of an internal safety plan for project-related field work.

The PMO will provide Quality Assurance/Quality Control (QA/QC) throughout the duration of the project. Monthly project status summaries will be provided. PMO staff will manage the scope, schedule, and budget associated with the work described in this Work Authorization to ensure that this work is managed in a manner that meets the intent of the GWA PMO Program Management Plan. This includes, but is not limited to, the management of documents, project changes, risk, and quality assurance and control. The PMO will effectively manage the project team members and perform administrative tasks for the project to produce a quality product

Guam Waterworks Authority  
Groundwater Well Production Meter Replacement

within budget and schedule.

**PMO Team Responsibilities:** PMO staff will manage the scope, schedule and budget. The PMO lead will manage tasks in this Work Authorization in accordance with the protocols set forth in the GWA PMO Program Management Plan.

**GWA Responsibilities:** GWA staff will attend meetings, review progress reports, and adhere to the protocols set forth in the GWA PMO Program Management Plan.

**Products:** Status reports; scope, schedule, and budget updates, as necessary.

**Task 2: Meetings and Reporting**

**Approach:** PMO staff will attend project-related meetings with GWA based on project progress, regulatory requirements and the resolution of pertinent issues to a maximum of once per month through the duration of the work authorization. Meetings will take place at GWA or by teleconference as appropriate. Design sketches, details, specifications and repair or replacement category types will be discussed at these meetings along with issues and information gaps.

**PMO Team Responsibilities:** The PMO staff will attend meetings and develop minutes of meetings, monthly progress and status reports, as necessary.

**GWA Responsibilities:** GWA project team will coordinate meetings and attend project status meetings.

**Deliverable:** Meeting minutes, progress and status reports as necessary.

**Task 3: Flow Meter Selection and Conducting Field Work**

**Approach:** The PMO will meet with GWA engineering and operations staff and select the most-suited brand and model of replacement flow meter for the groundwater wells. Meter features to evaluate include, but not limited to, the flow measuring range and accuracy, corrosion resistance of meter components, ease of repair or replacement, familiarity of GWA with the meter, data output capability, operational and installation requirements, security features and the overall flow meter durability.

Prior to field investigations, the PMO will develop meter and piping condition checklists for use in evaluating each site. The PMO Team will visit each of GWA's 120 well sites to develop a site-specific meter replacement or repair and calibrate strategy. During the visits, a well's current production capacity, based on available operations data, and the GEPA-permitted capacity will be recorded for use in determining the meter's required measuring range. Actual flow testing will not take place. Additionally, the discharge piping layout and size will be measured so proper meter installation can be designed. Procedures for taking the well offline during replacement or repair activities will be established with the understanding that some critical wells cannot be taken out of service. Each existing flow meter will be evaluated for conformance with the new

Guam Waterworks Authority  
Groundwater Well Production Meter Replacement

replacement meters' features and capabilities to determine if it is to be replaced or repaired and calibrated. Many of the wells are similar in design. The PMO Team will typify similarly designed wells into categories that will be used to group repair and replacement efforts into construction bid packages.

**PMO Team Responsibilities:** Provide GWA with potential flow meter options including make, model, manufacturing cut sheets/specifications, and other pertinent information. Provide a technical memorandum showing a summary of flow meter features and typical repair and replacement groupings.

**GWA Responsibilities:** Provide GWA escort familiar with all well site locations to expedite the timing of site visits, access locked doors/gates, and help with measuring activities.

**Deliverable:** Table showing site-by-site recommendation for flow meter replacement or repair and calibration.

**Task 4: Prepare Meter Replacement Plans and Specifications**

**Approach:** The PMO Team will develop site-specific construction Plans for each GWA well site where the replacement of an existing flow meter is deemed necessary and where discharge piping changes are required to ensure accurate measuring from an existing meter. Depending upon a well site's current piping configuration and condition, installation of the new replacement meter may require significant well site modifications be performed to accommodate a meter's placement requirements. For measurement accuracy, flow meters typically require undisturbed flow for a length of 10 pipe diameters upstream of the meter, and 5 downstream. The Plans will provide detailed drawings and photographs on a site-by-site basis that show the discharge piping modifications and other equipment alterations that are required for new meter installation and for improving existing meter measuring accuracy. Demolition plans, mechanical equipment and piping arrangements, electrical site plans, structural support plans and details will be included in the design drawings. The PMO will perform internal Quality Control checking on documents submitted to GWA.

Technical Specifications that support the Plans will be developed and will address work procedures, acceptable materials and equipment, as-built record keeping and submittal requirements. The PMO will submit 90 percent Plans and technical specifications to GWA for review. PMO will then incorporate the 90 percent review comments into a final bid-ready set of Plans and specifications. The PMO will prepare the technical specifications for use with GWA's current front-end bidding documents, Sections A, B and/or C as necessary, or EJCDC documents if desired by GWA. Bid-ready plans and specifications at 100 percent completion will be issued to GWA. The PMO will endeavor to identify permits required and prepare permit applications as necessary.

**PMO Team Responsibilities:** Prepare plans, specifications and documents for bid-ready packages.

Guam Waterworks Authority  
Groundwater Well Production Meter Replacement

**GWA Responsibilities:** Review design plans and specifications and assist in issuing the packages for bid.

**Deliverable:** Drawings and Technical Specifications at 90 percent and 100 percent completion levels. Bid-ready sets in electronic form. Permit applications as needed.

**Task 5: Services during Bidding**

**Approach:** PMO will provide engineering services during the bidding of the project. This task consists of:

- Respond to questions during the project bid period
- Prepare addenda prior to bid opening, if necessary
- Develop an Engineer's Opinion of Probable Construction Cost
- Evaluate bids and provide GWA with a contractor recommendation letter
- Prepare pre-bid meeting agenda, sign-in sheets, and minutes

**PMO Team Responsibilities:** Provide addenda, pre-bid meeting agenda, minutes of meetings, estimates and recommendation letter.

**GWA Responsibilities:** Conduct pre-bid meeting, coordinate bidding

**Deliverables:** Recommendation letter, minutes and agenda of meetings, estimates

**Task 6: Services During Construction**

**Approach:** PMO will provide engineering services during the construction of the project. This task consists of:

- Prepare final (100%) "Issued for Construction" conformed plans and specifications incorporating addenda, change orders and changes during the bid phase.
- Attend weekly construction progress meetings as required by the Construction Manager (CM).
- Perform field observations as required by the CM and submit field reports documenting any findings
- Review contractor submittals, RFI's, Change Orders and contractor's schedule and provide responses/comments as requested by the CM.
- Perform final inspections and submit punch list as requested by the CM.

**PMO Team Responsibilities:** Provide responses to RFI's, submittals, change management, field observations, meetings, and final inspections. GWA will be responsible for construction management and the PMO will provide support as requested by the CM.

**GWA Responsibilities:** Coordinate with CM and Contractor, keep PMO informed on developments. GWA will be responsible for day-to-day construction management.



Guam Waterworks Authority  
Groundwater Well Production Meter Replacement

**Deliverables:** Responses to RFIs, submittals, change orders, meeting minutes, and punch lists.

**ASSUMPTIONS**

For the purpose of this proposal, the following assumptions were made:

- On average four (4) groundwater wells will be visited per day.
- No weekend or holiday work.
- Ten (10) working days for rain delays.
- GWA will provide a knowledgeable staff member to accompany the PMO to the well sites.
- The PMO will use GWA's current groundwater well standards and Hawaii standards as appropriate for design details.
- GWA will select a production meter type, brand and manufacturer.

**EXCLUSIONS**

The following tasks are not included in this work:

- Project procurement
- Design documents that will be used for construction
- Public outreach

**SCHEDULE**

The PMO Team would be able to commence work immediately upon receiving a written Notice to Proceed (NTP). The scope of services described in this work authorization is expected to be completed by January 31, 2017.

**BUDGET SUMMARY**

Labor (Labor Hours -1,880)	\$388,696
ODCs	\$24,844
GRT	\$17,230
Total	\$430,770

Guam Waterworks Authority  
Groundwater Well Production Meter Replacement

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Guam Waterworks Authority  
 Groundwater Well Production Meter Replacement

**BUDGET**

This work order will be performed on a time and materials basis and will not exceed \$430,770 without written consent from GWA.

<b>Labor</b>				
<b>Name</b>	<b>Labor Code</b>	<b>Labor Rate</b>	<b>Hours</b>	<b>Amount</b>
Gilman/Chang	M	250	168	\$42,000
Matasci	M	250	56	\$14,000
Worster	K	242	640	\$154,880
Bilz	J	234	24	\$5,616
Sr. Engineer	H	185	256	\$47,360
Chief Drafter	H	185	480	\$88,800
Engineer 2	F	140	184	\$25,760
Tamai	G	155	56	\$8,680
Engineer 1	E	120	0	0
Admin	D	100	16	\$1,600
<b>Labor Subtotal</b>				<b>\$388,696</b>
<b>Other Direct Costs</b>				
<b>Description</b>				<b>Amount</b>
Airfare Mainland 2@\$3,000				\$6,000
Airfare Hawaii 1@\$2,000				\$2,000
Rental Car \$75 @ 50 days				\$3,750
Per Diem \$250 @ 50 days				\$12,500
Mileage 1,100 miles @ \$0.54/mi				\$594
<b>ODC Subtotal</b>				<b>\$24,844</b>
<b>Total Work Order Estimate</b>				
Labor Subtotal				\$388,696
ODC Subtotal				\$24,844
GRT (4.167%)				\$17,232
<b>Total</b>				<b>\$430,772</b>

Guam Waterworks Authority  
Project Management for Umatac-Merizo WWTP Upgrade and Preparation of Design/Build  
Bridging Documents

**TO:** Brown and Caldwell  
414 W. Soledad Ave.  
Suite 907  
Hagatna, Guam 96910

**WORK AUTHORIZATION NO.:** 2016-07

**SUBMITTAL DATE:** June 27, 2016

**FROM:** Miguel C. Bordallo, PE  
GENERAL MANAGER  
GUAM WATERWORKS AUTHORITY

You are hereby authorized to perform the services described below in accordance with the Contract for Technical and Professional Services executed February 6, 2012 between Brown and Caldwell (BC) and Guam Waterworks Authority (GWA) for Program Management Services, GPA-RFP-11-005.

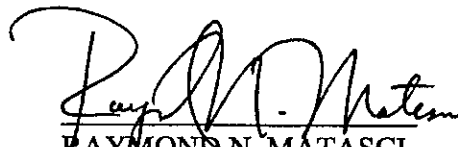
**DESCRIPTION OF WORK AND FEE ESTIMATES**

**DESCRIPTION:** Project Management for Umatac-Merizo WWTP Upgrade and Preparation of Design/Build Bridging Documents

Defined cost, scope and schedule on a time and materials basis are provided in the attached proposal letter and consists of providing a design/build procurement document and project management services for the Umatac-Merizo Wastewater Treatment Plant (WWTP) upgrade in order to comply with the 2011 Court Order, Paragraph 16.

NOT TO EXCEED amount: \$1,389,730.00

Signed



RAYMOND N. MATASCI  
SR. VICE PRESIDENT/PROGRAM MANAGER  
BROWN AND CALDWELL

Date June 27, 2016

GWA Reviewer:

\_\_\_\_\_  
THOMAS F. CRUZ, P.E.  
CHIEF ENGINEER

Date \_\_\_\_\_

Signed

\_\_\_\_\_  
MIGUEL C. BORDALLO, P.E.  
GENERAL MANAGER  
GUAM WATERWORKS AUTHORITY

Date \_\_\_\_\_

Guam Waterworks Authority  
Project Management for Umatac-Merizo WWTP Upgrade and Preparation of Design/Build  
Bridging Documents

**WORK AUTHORIZATION NO: 2016-07**

**DESCRIPTION:** Project Management for Umatac-Merizo WWTP Upgrade and Preparation of Design/Build Bridging Documents

**GWA PROJECT MANAGER: Thomas F. Cruz, P.E.**

**PROJECT BACKGROUND AND OBJECTIVE**

The 2011 Court Order, Paragraph 15 required GWA to prepare the Umatac-Merizo Wastewater System Evaluation. The Umatac-Merizo Wastewater System Evaluation and associated supplement identified a \$20.4M upgrade for the Umatac-Merizo WWTP.

The 2011 Court Order, paragraph 16 establishes the following compliance dates:

1. By June 30, 2016, GWA shall execute a design contract and issue a notice to proceed with the design.
2. By June 30, 2017, GWA shall execute a construction contract and issue a notice to proceed with construction.
3. By December 31, 2018, GWA shall complete the improvements identified in the approved plan required by Paragraph 15 and achieve consistent compliance with the Umatac-Merizo WWTP's NPDES permit.

The Umatac-Merizo Wastewater System Evaluation and associated supplement identified that consistent compliance with the existing NPDES permit nutrient limits (nitrogen and phosphorus) for discharge to the Toguan River are not achievable, and other effluent management options are not cost effective for this small, remote WWTP. GWA has elected to pursue modified NPDES requirements, and has initiated a water quality monitoring program designed to develop data to support a variance to the Guam Water Quality Standards for the WWTP and modified NPDES permit conditions.

GWA executed Work Authorization #2014-12, dated January 13, 2015, for preliminary design of the Umatac-Merizo WWTP upgrade with expected completion by June 30, 2016. In order to meet the court order deadline for executing a construction contract by June 30, 2017 and completing the improvements by December 31, 2018, GWA has decided to implement the project by procuring a design/build contractor.

**SCOPE OF WORK**

This work authorization will be performed by the Brown and Caldwell Program Management Office (PMO) Team. This scope outlines the overall PMO Team scope, schedule, and budget.

This Work Authorization will provide engineering services to: prepare bridging documents for packaging the preliminary design report into a design/build procurement document; provide project management services and design oversight during the project execution; and prepare a request for proposal for GWA to procure construction management services.

**Task 1: Task Management**

**Approach:** GWA PMO staff will manage the scope, schedule, and budget associated with the work described in this Work Authorization to ensure that this work is managed in a manner that meets the intent of the GWA PMO Program Management Plan. This includes, but is not limited to, management of documents; change; risk; and quality assurance and control.

**PMO Team Responsibilities:** PMO staff will manage the scope, schedule and budget. The PMO lead will manage tasks in this Work Authorization in accordance with the protocols set forth in the GWA PMO Program Management Plan.

**GWA Responsibilities:** GWA staff will attend meetings, review progress reports, and adhere to the protocols set forth in the GWA PMO Program Management Plan.

**Products:** Task status reports; scope, schedule, and budget updates, as necessary.

**Task 2: Design/Build Bridging Document Preparation**

**Approach:** The PMO will assist GWA in preparing for and conducting work necessary to procure a qualified design/build contractor team. Work consists of:

- 1) *Work with GWA to conduct a Multi-Step Bid:*
  - Conduct a Multi-step Bid approach to determine qualifications and capability of contractors and specialty designers needed for this work.
  - Prepare Information for Bidders
  - Develop scope of work
  - Develop qualification criteria
  - Develop scoring criteria
  - Develop technical offer requirements
  - Determine qualification of designer's experience
  - Review of contractor/bidder's technical offer
  - Assist GWA in developing the short list of qualified design/build bidders
  
- 2) *Work with GWA attorney to develop appropriate bid package:*
  - Compare and Evaluate use of GWA's contract documents versus EJCDC design/build documents versus DBIA design/build documents
  - Work with GWA's attorney to address requirements for Multi-step Bid and Design/Build Procurement
  
- 3) *Prepare the bidding documents:*
  - Prepare the bid form
  - Prepare D/B contract documents

Guam Waterworks Authority  
Project Management for Umatac-Merizo WWTP Upgrade and Preparation of Design/Build  
Bridging Documents

- Develop special conditions, if any
- Prepare Preliminary Design Documents
- Prepare technical specifications and performance specifications for the work
- Confirm the permit criteria

4) *Perform Bidding Services:*

- Prepare Addenda as necessary
- Address RFIs and contractor questions
- Prepare Pre-bid meeting agenda and minutes and attend meeting
- Assist GWA in negotiation with D/B contractor
- Assist GWA in the Award and prepare resolutions for Board action

During the multi-step design/build contract procurement, the PMO will evaluate proposers' technical submittals and assist GWA in creating a short list. The PMO will attend bid opening, collect bid tabs and submit to GWA, provide written statements when and if the lowest bidder was not selected and documentation of the reasons, and provide recommendations of award.

**PMO Team Responsibilities:** Prepare contract bidding documents and perform work as described. Assist GWA in procurement of a qualified design/building.

**GWA Responsibilities:** Work with the PMO to create appropriate and satisfactory bridging documents for procurement of a design/build contractor.

**Products:** A Multi-Step Bid, short list, complete bidding documents, addenda, and award resolution.

**Task 3: Construction Management RFP**

The PMO will perform the following work:

- Prepare procurement solicitation for Construction Management
- Prepare a Scope of Work for the Construction Manager to include inspections and specialty inspections
- Prepare RFP
- Address RFIs and consultant questions
- Conduct pre-bid meeting
- Review consultant submittals and statements of qualification
- Assist GWA in negotiations on scope and fee
- Assist GWA in awarding the construction management work and prepare award resolutions for presentation to the Board

**Task 4: Water Quality Sampling Data Evaluation**

The PMO will perform the following:

- Continue to monitor the water quality sampling and flow monitoring in the Toguan River conducted by others
- Evaluate the data with respect to actual monitored water quality results in comparison to the existing GEPA established water quality standards
- Define new standards based on monitoring data
- Prepare a technical memorandum outlining the sampling and monitoring findings and generate recommendations for the revised water quality standards for the Toguan River
- Assist GWA in preparation of a waiver to GEPA to modify the water quality standards for the Toguan River Basin
- Define the mixing zone and dilution factors where the Umatac-Merizo WWTP effluent will blend with the Toguan River. Confirm the NPDES permit requirements for Umatac-Merizo WWTP.

**Task 5: Project Management of Umatac-Merizo Design/Build Project**

- 1) *Approach:* The PMO Team will manage the project from design/build document preparation phase, through procurement, design, construction and closeout. The PMO will perform the following project management services:
  - Work with the GWA Engineering group and manage the project as directed by GWA
  - Provide project management, design oversight, and technical subject matter expertise for the project
  - Handle consultant and contractor payment requests and substantiate documentation for pay requests
  - Provide design oversight for engineering design work, assist with change order development, review and processing. Provide weekly progress updates to GWA Chief Engineer and status updates to the Assistant General Manager of Compliance and Safety
  - Control costs and manage to budget
  - Facilitate project team cooperation and input
  - Maintain project files
  - Arrange and attend the final scope and fees negotiation meetings and offer recommendations to GWA
  - Track and report on cash flow projections
  - Review contractor invoices and recommend payment
- 2) *The PMO will perform the following design oversight services:*
  - Arrange, coordinate and participate in technical reviews at initial kickoff, 60% and 90% landmarks
  - Receive, review, distribute and return comments on technical memorandum and reports issued by design/build contractor



Guam Waterworks Authority

Project Management for Umatac-Merizo WWTP Upgrade and Preparation of Design/Build Bridging Documents

- Review design technical memorandums prepared by design/build contractor
- Conduct review meetings with design/build contractor
- Perform constructability reviews and issue comments
- Obtain input and consensus from operations and maintenance divisions
- Track building permits from Dept. of Public Works to be obtained by the design/build contractor
- Track necessary stream buffers or 404 permits
- Track environmental and cultural resources permits
- Coordinate Guam EPA review and approval as needed

*Assumptions:*

- Archeological and cultural resources work will be performed by others under separate contract with GWA
- Geotechnical subsurface investigation will be performed by others under separate contract with GWA

3) *The PMO will provide the following Project Management services during construction:*

- Perform contract management, monitor contractor work plans, review cost breakdowns and schedules of values, notify GWA of construction start, attend meetings with GWA during construction, verify as-built drawings are being prepared by the design/build contractor, and submit final copies of work products to GWA. The PMO will perform Change Order management and provide advance notification of changed conditions and budget category transfer requests to GWA and seek GWA approvals.
- Work with the contractor to obtain a Plan of Operation including O&M Manual, emergency operation plan, site safety plan, and personnel training plan as required. The PMO will assist GWA in issuing a letter at the close of the project certifying that the project meets or does not meet project performance standards. Corrective action reports and cost estimates for corrective action will be prepared, along with a schedule for corrective action. The PMO will assist GWA in notification of Public Media Events and publicity for accomplishments.
- Arrange for and coordinate bid award activities
- Arrange groundbreaking where required
- Manage construction management contracts
- Supervise and monitor the activities and schedules for materials testing consultant
- Monitor CPM Schedules
- Coordinate change orders
- Coordinate, review, approve and monitor erosion and sediment control measures
- Conduct periodic site visits
- Track RFI's, RFP's, Work Change Directives (WCD's), change orders, shop drawings and other submittals
- Assist CM with conducting claims analysis and claims resolution
- Coordinate, review and approve payments to contractor and consultants; verify quantities
- Determine substantial completion and prepare lists of incomplete or unsatisfactory items and a schedule for their completion.

Guam Waterworks Authority  
Project Management for Umatac-Merizo WWTP Upgrade and Preparation of Design/Build  
Bridging Documents

- Oversee start up training provided by the design/build contractor
- Work with GWA to provide public communications (GWA has the lead on this effort)
  
- 4) *The PMO will provide the following services during Project Closeout:*
  - Submit fixed asset management reports to GWA
  - Arrange dedication as required
  - O & M Manual Review
  - Deliver all project files to GWA in digitally archived and one hard copy format
  - Review and deliver as-built record drawings to GWA
  - Coordinate with Design/Build Contractor and GWA on preparation of inspection punch lists
  - Startup and commissioning
  - Warranty review
  - Final summary change order
  - Develop the transition plan for transfer of facilities to GWA Operations

**PMO Team Responsibilities:** Manage projects as directed by GWA and provide services outlined in tasks above

**GWA Responsibilities:** Participate in reviews, meetings and project management of the project

**Products:** Project documentation.

**SCHEDULE**

The effort described in this work authorization will be conducted from approximately August 2016 through December 2018 in order to comply with the 2011 Court Order deadlines.

**BUDGET SUMMARY**

Labor (Labor Hours – 7,212)	\$1,310,992
ODC	\$23,145
GRT	\$55,593
Total	\$1,389,730

Guam Waterworks Authority  
 Project Management for Umatac-Merizo WWTP Upgrade and Preparation of Design/Build  
 Bridging Documents

**BUDGET**

This work order will be performed on a time and materials basis and will not exceed \$1,389,730 without written consent from GWA.

<b>Labor</b>				
<b>Name(s)</b>	<b>Labor Code(s)</b>	<b>Labor Rate</b>	<b>Hours</b>	<b>Amount</b>
Matasci	N	\$250	128	\$32,000
Chang/Crites	L	\$250	322	\$80,500
Lekven	J	\$234	678	\$158,652
Bilz	J	\$234	1,748	\$409,032
Gilman	M	\$250	158	\$39,500
Tangora/Bell	K	\$242	264	\$63,888
Constantinescu/DeBoer	H	\$185	658	\$121,730
Watson	F	\$140	1,928	\$269,920
Tamai	G	\$155	54	\$8,370
Heramil	D	\$100	1,274	\$127,400
			<b>Labor Subtotal</b>	<b>\$1,310,992</b>
<b>Other Direct Costs</b>				
<b>Description</b>				<b>Amount</b>
Airfare \$2,000 (x4) from HNL				\$8,000
Airfare \$3,000 (x1) from Mainland				\$3,000
Rental Car \$75/day (35 days)				\$2,625
Per Diem \$250/day (35days)				\$8,750
Mileage				\$270
Miscellaneous				\$500
			<b>ODC Subtotal</b>	<b>\$23,145</b>
<b>Total Work Order Estimate</b>				
			<b>Labor Subtotal</b>	<b>\$1,310,992</b>
			<b>ODC Subtotal</b>	<b>\$23,145</b>
			<b>GRT (4.167%)</b>	<b>\$55,593</b>
			<b>Total</b>	<b>\$1,389,730</b>

Guam Waterworks Authority  
Program Management Services Contract Work Authorization

**TO:** Brown and Caldwell  
414 W. Soledad Ave.  
Suite 907  
Hagatna, Guam 96910

**WORK AUTHORIZATION NO.:** 2016-08

**SUBMITTAL DATE:** June 23, 2016

**FROM:** Miguel C. Bordallo, P.E.  
GENERAL MANAGER  
GUAM WATERWORKS AUTHORITY

You are hereby authorized to perform the services described below in accordance with the Contract for Technical and Professional Services executed February 6, 2012 between Brown and Caldwell (BC) and Guam Waterworks Authority (GWA) for Program Management Services, GPA-RFP-11-005.

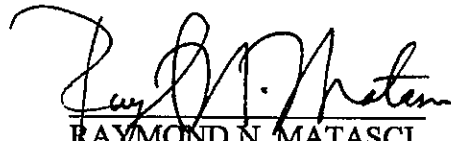
**DESCRIPTION OF WORK AND FEE ESTIMATES**

**DESCRIPTION:** Program Management Support 2016-2017

Defined cost, scope and schedule on a time and materials basis are provided below and consist of providing general program management support for GWA from Oct 1, 2016 to September 30, 2017. General program management support consists of managing and consulting oversight of GWA's capital improvements program and engineering advice on projects and programs that have critical and urgent deadlines, a brief scope and limited budget. Additionally, updates to the Program Strategy, Master Program Schedule, and Program Benefits Delivery are included.

NOT TO EXCEED amount: **\$ 869,994.00**

Signed



RAYMOND N. MATASCI  
SR. VICE PRESIDENT/PROGRAM MANAGER  
BROWN AND CALDWELL

Date June 23, 2016

GWA Reviewer:

\_\_\_\_\_  
THOMAS F. CRUZ, P.E.  
CHIEF ENGINEER

Date \_\_\_\_\_

Signed

\_\_\_\_\_  
MIGUEL C. BORDALLO, P.E.  
INTERIM GENERAL MANAGER  
GUAM WATERWORKS AUTHORITY

Date \_\_\_\_\_

Guam Waterworks Authority  
Program Management Services Contract Work Authorization

**WORK AUTHORIZATION NO: 2016-08**

**DESCRIPTION:** Program Management Support

**GWA PROJECT MANAGER:** Thomas F. Cruz, P.E.

### **PROJECT BACKGROUND AND OBJECTIVE**

The purpose of this task order is to provide general program management support as part of GWA's Program Management Office (PMO) for GWA's Capital Improvements Program and engineering advice on critical issues facing GWA.

### **SCOPE OF WORK**

#### **Task 1: Program Planning, Implementation and Management**

The Program has completed its fourth year and many accomplishments and objectives have been achieved. A review of the program with respect to strategy, benefits realization, and execution will be performed to assure alignment with GWA's goals and objectives. Working together with GWA, program needs and direction will be developed with GWA staff and validated by the PMO. Improvements and changes will be documented in the updated program management plan. The following proposed subtasks will assist GWA in improving efficiency and internal capabilities.

##### **SubTask 1.1: General**

The PMO will assist GWA with identifying component-project needs, planning the work, and coordinating with other Government of Guam agencies as required. The PMO will assist GWA in developing scopes of work and work plans for CIP projects, PUC Stipulated Order projects and Court Order projects as required including preparation of work authorizations. PMO staff will collect information via document review and GWA staff interviews to develop work authorizations including scopes, schedules, budgets, and staffing plans for tasks that GWA delegates to the PMO. The PMO will effectively manage the project team members and perform administrative tasks for the projects to produce a quality product within budget and schedule.

The PMO will:

- be responsible for updating and implementing the program management plan.
- use a progress monitoring system to track team expenditures and product completion, providing the basis for PMO actions;
- use a monthly review process that estimates level of effort to complete and determines value earned, providing the basis for work plan modifications to meet budget and schedule;
- manage staff resources and sub-consultants to assure timely product generation and response; and
- conduct periodic quality control review of the work before final submittal to GWA.

The program will provide for housing subsistence, utilities, and a lease car for two full-time employees dedicated to the contract. In addition, airfare and per diem to bring subject knowledge technical experts as needed to Guam is limited to a total of seven (7) personnel, each

Guam Waterworks Authority  
Program Management Services Contract Work Authorization

for one week duration.

**PMO Team Responsibilities:** PMO staff will provide updates to the program management plan and implement the plans and protocols listed in the program management plan. The PMO will develop work authorizations, scopes, schedules, budgets and staffing plans.

**GWA Responsibilities:** GWA staff will review and provide comments on the plans, schedules, recommendations, and deliverables. GWA staff will participate in reviews and analyses and abide by the protocols set forth in the plans. GWA staff will participate in subject matter technical discussions.

**Products:** Program management plan updates, scopes of work, meetings.

**Task 2: Meeting and Reporting**

**Approach:** PMO staff will be working closely with GWA staff to successfully deliver the program and will meet with GWA's Chief Engineer and Asst. General Manager of Compliance and Safety regularly. It is expected that PMO staff will meet with GWA staff weekly and provide weekly action items reports along with monthly progress reports. Monthly reports will address earned values and percent resources (man-hours and expenses) expended to date, decision tracking reports (issues and their resolutions), schedule for design and construction activities, and program changes (initiated by GWA, design-related, and/or other forces). Templates will be used for weekly and monthly reports and will be included in the program management plan described in Task 1.

The PMO will prepare quarterly reports to the PUC on the status and performance of the PMO team. Reports will be comprised of a narrative, numerical, and graphical formats that track project performance and progress. The PMO will prepare periodic reports on training provided to GWA. The PMO will attend as necessary PUC and CCU meetings and work sessions.

**PMO Team Responsibilities:** BC staff will coordinate and attend weekly status meetings, develop weekly and monthly progress reports and invoices, and develop quarterly and periodic reports.

**GWA Responsibilities:** GWA staff will be required to attend meetings and review progress reports.

**Products:** Weekly, monthly and quarterly progress reports, monthly invoices, and training reports.

**Task 3: Program and Technical Support**

**Approach:** On an as-needed basis, the PMO will provide a highly qualified, specialized technical support team that covers engineering, management, business and organizational processes, technical and analytical presentations, inspection, claims management, and scientific disciplines necessary to respond to issues that may require specialized support during the

Guam Waterworks Authority  
Program Management Services Contract Work Authorization

contract period. This team shall be available for resolution of critical issues, claims, special design reviews and reports, inspections, and other specialized technical assistance during planning, design, construction and close-out phases of the component-projects and the program.

During the course of the program it is expected that GWA will require the PMO to conduct short duration and immediate tasks such as independent research, document review, technical opinions and evaluations. These tasks will often have critical and urgent deadlines, a brief scope and limited budget. It may be inefficient for such tasks to require the development of a stand alone work authorization. Program support will be used for the PMO to respond to GWA's immediate needs required to support the overall program and GWA's operations. Tasks will be assigned to the PMO on an as-needed basis. Examples of such tasks as directed by GWA are, but not limited to:

- Support for ONE-GUAM water initiative requiring hydraulic analysis, mapping, studies and technical memoranda.
- Technical support for construction related and startup issues on water and wastewater treatment plant and pumping station facilities.
- Review and edit specifications for GWA's specific equipment purchase.
- Identify appropriate curriculum for GWA to conduct internal training for "Utility Performance" improvement.
- Work with GWA in promoting knowledge transfer between members of the PMO and GWA staff through mentoring and training.
- Assist GWA in staff training programs for Engineering and Operations staff which include but are not limited to project management, risk management, and design-build project delivery.
- Assist GWA in understanding, training, and adopting the Engineers Joint Contract Documents Committee (EJCDC) construction documents for design, technical and construction contracts.
- Assist GWA in establishing the "operations engineer" position and developing job descriptions and standard procedures to integrate Engineering support with Operation's needs.
- Strategic/CIP planning and scheduling.
- Support and address unique program management requirements related to the Guam military build-up, consisting of meetings with the DoD and Gov-Guam agencies, preparing emails and memos to communicate GWA needs and recommendations on the buildup, and review and comment on DoD documents.
- Review/evaluate/support current GWA contractor and consultant contracts, procurement, change orders, dispute resolution, project close-out, invoice processing and other administrative practices enabling GWA to become more efficient and cost effective in the management of resources.

Guam Waterworks Authority  
Program Management Services Contract Work Authorization

- Provide Engineering services to report on and support environmental compliance with US EPA and Guam EPA. This includes supporting GWA on current court order requirements as well as potential new enforcement actions.
- Provide technical support for Environmental Attorney in regards to USEPA actions.
- Conduct Business Case Evaluations on technical proposals presented to GWA including present worth analyses, cost-benefit ratios, economic and non-economic analyses and preparation of technical memoranda.
- Participate in and provide technical support during project meetings.
- Provide peer review, comments and recommendations on engineering studies, reports, and designs conducted by others.
- Provide support for procurements of GWA projects and evaluate bids, technical engineering capabilities, contractor qualifications and review of contract bidding documents.
- Work with GWA to develop a basic information system to support Project Management by providing project information on budget, cost, schedule, scope, status, and location.

**PMO Team Responsibilities:** The PMO will provide the technical support team as needed. The PMO will conduct short duration and immediate tasks as directed by GWA.

**GWA Responsibilities:** GWA staff will be required to attend meetings and provide available information to the PMO on upcoming tasks. GWA staff will be required to document the effort needed via e-mail or letter to the PMO.

**Products:** General services such as research and document review, reports, opinions, white papers, studies, meeting minutes, and memoranda.

**Task 4: Program Contract Assistance**

**Approach:** At GWA's discretion, the PMO team will prepare and review requests for proposals and scopes of work to procure engineering and construction contracting services from the local community. The program manager will also be available to participate in the negotiation of contracts with selected consultants and contractors for individual projects. Services are intended to include planning, design, design/build, construction, plant information and asset management systems, instrumentation contracts, and other tasks as may be requested by GWA.

**PMO Team Responsibilities:** The PMO will provide contract assistance, as needed.

**GWA Responsibilities:** GWA staff will review contract documentation and provide guidance to the PMO on services requested for individual projects.

**Products:** Contract documents.



Guam Waterworks Authority  
Program Management Services Contract Work Authorization

**SCHEDULE**

The effort described in this work authorization will be conducted from October 1, 2016 through September 30, 2017.

**BUDGET SUMMARY**

Labor (Labor Hours – 3,435)	\$719,904
ODC	\$115,287
GRT	\$34,803

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Total \$869,994

Task 1: Program Planning, Implementation and Management	\$273,866
Task 2: Meeting and Reporting	\$202,326
Task 3: Program and Technical Support	\$288,068
Task 4: Program Contract Assistance	\$105,734

**Guam Waterworks Authority  
Program Management Services Contract Work Authorization**

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Guam Waterworks Authority  
 Program Management Services Contract Work Authorization

**BUDGET DETAILS**

This work order will be performed on a time and materials basis and will not exceed \$868,994 without written consent from GWA.

<b>Labor</b>				
<b>Name</b>	<b>Labor Code</b>	<b>Labor Rate</b>	<b>Hours</b>	<b>Amount</b>
Chang	L	\$250	876	\$219,000
Bilz	K	\$234	600	\$140,400
Gilman	M	\$250	318	\$66,500
Matasci	N	\$250	364	\$85,000
Watson	E	\$140	213	\$29,820
Marble	E	\$140	60	\$8,400
Myers	K	\$242	40	\$9,680
Tamai	G	\$155	344	\$53,320
Sr. Advisor	M	\$250	248	\$81,000
Admin	I	\$100	232	\$26,784
<b>Labor Subtotal</b>			<b>3,460</b>	<b>\$719,904.00</b>
<b>Other Direct Costs</b>				
<b>Description</b>				<b>Amount</b>
Airfare \$2000 (x4) from HNL				\$8,000
Airfare \$3000 (x3) from Mainland				\$9,000
Rental Car \$75/day (35 days)				\$2,625
Per Diem \$250/day (35 days)				\$8,750
Mileage				\$512
Overseas Housing Allowance \$2250/mo (2x)				\$54,000
Utility/Recurring Maintenance \$600/month (2x)				\$14,400
Lease Car \$750/month (2x)				\$18,000
<b>ODC Subtotal</b>				<b>\$115,287.00</b>
<b>Total Work Order Estimate</b>				
<b>Labor Subtotal</b>				<b>\$719,904</b>
<b>ODC Subtotal</b>				<b>\$115,287</b>
<b>GRT (4.167%)</b>				<b>\$34,803</b>
<b>Total</b>				<b>\$869,994.00</b>

Guam Waterworks Authority  
Backflow Prevention and Cross-Connection Control Program

TO: Brown and Caldwell  
414 W. Soledad Ave  
Suite 907  
Hagatna, Guam 96910

WORK AUTHORIZATION NO.: 2016-09

SUBMITTAL DATE: June 24, 2016

FROM: Miguel C. Bordallo, PE  
GENERAL MANAGER  
GUAM WATERWORKS AUTHORITY

You are hereby authorized to perform the services described below in accordance with the Contract for Technical and Professional Services executed February 6, 2012 between Brown and Caldwell (BC) and Guam Waterworks Authority (GWA) for Program Management Services, GPA-RFP-11-005.

**DESCRIPTION OF WORK AND FEE ESTIMATES**

**DESCRIPTION: Backflow Prevention and Cross-Connection Control Program**

The objective of developing a Backflow Prevention and Cross Connection Control Program is to assist Guam Waterworks Authority in providing reasonable protection to the GWA potable public water supply and system. Such protection will help prevent contamination and/or pollution resulting from backflow and/or back siphonage through uncontrolled plumbing connections and cross connections. This Work Authorization will develop and prepare a written program to be implemented by GWA that defines applicable codes, rules and regulations, and defines the resources required to implement a safe and reliable backflow prevention and cross connection control program. The defined cost, scope and schedule below will be conducted on a time and materials basis.

NOT TO EXCEED amount: \$ 154,570.00

Signed



RAYMOND N. MATASCI  
SR. VICE PRESIDENT/PROGRAM MANAGER  
BROWN AND CALDWELL

Date

June 23, 2016

GWA Reviewer:

Date

Signed

MIGUEL C. BORDALLO, PE  
GENERAL MANAGER  
GUAM WATERWORKS AUTHORITY

Date

Guam Waterworks Authority  
Backflow Prevention and Cross-Connection Control Program

**WORK AUTHORIZATION NO: 2016-09**

**DESCRIPTION: Backflow Prevention and Cross-Connection Control Program**

**GWA PROJECT MANAGER: Thomas F. Cruz, PE**

**PROJECT BACKGROUND AND OBJECTIVE**

The purpose of this Work Authorization is to develop a Backflow Prevention and Cross Connection Control Program to assist Guam Waterworks Authority with providing reasonable protection to the GWA public potable water supply and system. This protection will help prevent contamination and/or pollution resulting from backflow and/or back siphonage through uncontrolled plumbing connections and cross connections.

This Work Authorization will develop and prepare a written program to be implemented by GWA that defines applicable codes, rules and regulations, and defines the resources required to implement a safe and reliable backflow prevention and cross connection control program. Cross-connections between public water supplies and non-potable sources of contamination pose significant threats to the health, safety, and welfare of the people of Guam. In order to provide proper sanitary protection to GWA's water supply and to comply with the applicable regulations, Guam law requires at Title 28, G.A.R.R. Section 2114(a) that no cross-connections with other water supplies, or other physical connections, shall exist, or be installed, located, maintained or operated which could permit backflow of contaminated water or any other dangerous, impure, unsanitary, or non-potable substance from the consumer's premises into GWA's water supply system. GWA at this time wishes to maintain the safety of Guam's water supply system by establishing policies, procedures and an inspection program to prevent the contamination of public drinking water by unapproved backflow.

**SCOPE OF WORK**

This work authorization will be performed by the PMO Team as outlined in the sections below.

**Task 1: Task Management**

**Approach :** The GWA Program Management Office (PMO) staff will manage the scope, schedule, and budget associated with the work described in this Work Authorization to ensure that this work is managed in a manner that meets the intent of the GWA PMO Program Management Plan. This includes, but is not limited to, management of documents, change, risk, and quality assurance and control. This task shall include periodic progress conference calls or meetings between PMO and GWA personnel to review project progress, issues to be resolved, early study results, etc. PMO staff will attend joint meetings with GWA and other stakeholders of this project monthly to discuss project status, action items, schedule and accomplishments. This task covers efforts associated with the internal quality control and technical review process. Specifically, the PMO will conduct internal QA/QC meetings and follow-up with technical experts as necessary during the course of the project. Internal checking or peer review of all deliverables will also be performed.

**BC Responsibilities:** PMO staff will manage the scope, schedule and budget in accordance with

Guam Waterworks Authority  
Backflow Prevention and Cross-Connection Control Program

the protocols set forth in the GWA PMO Program Management Plan.

**GWA Responsibilities:** GWA staff will attend meetings, review progress reports, and adhere to the protocols set forth in the GWA PMO Program Management Plan.

**Task 2: Data Gathering**

**Approach:** The PMO Team will work with GWA to collect information needed for this study, as follows:

1. *Ordinances, Codes, Territory Rules, Regulations.* The PMO Team will gather existing ordinances, codes, regulations and delegation of authority for GWA and GEPA to administer and enforce backflow prevention and cross connection controls.
2. *Existing Customer Lists of those Requiring Backflow Prevention.* The PMO Team will determine from existing lists and customer database those non-residential customers who likely require backflow prevention at their facilities. A list of plants and facilities where backflow prevention is usually required will be developed. This includes government facilities such as military facilities, wastewater pumping stations and wastewater treatment plants.
3. *Existing cross connection facilities and locations.* The PMO Team will determine from existing data, customer databases, interviews with GWA staff, and water distribution system maps the location of existing cross connection facilities, piping and areas of concern. Establish a database for the facilities; the database will include the following components:
  - a. Building name, property owner, address and phone number
  - b. Company name and point of contact information
  - c. Monthly average water use
  - d. Type of business, i.e. hotels, clinic, restaurants, construction... etc.
  - e. Backflow prevention devices and configuration photos, as available.
4. *Existing Approved Backflow Prevention Equipment and Designs.* The PMO Team will determine from interviews with GWA staff (Engineering, Operations, and Inspection) which equipment, designs and standards are commonly used for backflow prevention on Guam, and which Models, Brands, Schedules and arrangements are preferred by GWA staff.
5. *GWA Existing Operational Practices.* The PMO Team will investigate GWA's existing job classifications, inspection routes, times to complete the routes, and available data collection forms and practices.
6. *Limited Interviews with Customers.* The PMO Team will conduct limited interviews as necessary with non-residential customers about their existing backflow prevention facilities to determine the required level of routine inspection practices.

**BC Responsibilities:** Gather data, conduct interviews, assemble lists of facilities.

**GWA Responsibilities:** Answer questions during interviews. Provide updated information during data collection. Attend meetings. Provide examples of facility arrangements and equipment preferences.

Guam Waterworks Authority  
Backflow Prevention and Cross-Connection Control Program

**Products:** Data collected during interviews and research.

**Task 3: Develop Policies and Procedures for Backflow Prevention**

**Approach:** The PMO Team will work with GWA to develop appropriate policies and procedures for:

1. Determining customer types that are required to install backflow prevention measures and the type of measure suitable for their situation
2. Establishing a procedure for addressing internal cross connections on public and private premises that cannot be corrected or protected against
3. Addressing high hazards from premises where reduced pressures could cause contaminants to enter the potable public water supply
4. Determining the notification process for customers who potentially could cause and/or experience cross connection contamination issues
5. Determining the degree of enforcement on customers who may potentially jeopardize the safety of the potable public water system.
6. Determining the level of field verification and inspection of non-residential customer's facilities on a regular basis to determine compliance with backflow prevention and cross connection control.
7. Develop an inspection program to evaluate, track and enforce the approved Cross-Connection Control Regulations. The program will contain the following components in a flow chart, checklist or Standard Operating Procedures (SOPs) formats:
  - a. Inspection protocol
  - b. Inspection form
  - c. Training and Certification
  - d. Selection, sizing and testing the backflow prevention devices
  - e. Responding to backflow and potential water system contamination event
  - f. Installation inspection form
  - g. Preventive maintenance and testing form and checklist

Policy and procedure development will be conducted through two (2) two-hour workshops involving GWA staff and the PMO Team. AWWA policies will be presented as guidance.

**BC Responsibilities:** Work with GWA to identify policies, procedures, enforcement and inspection for backflow prevention and cross connection control. Conduct workshops.

**GWA Responsibilities:** Participate in workshops.

**Products:** Workshop minutes. Lists of accepted policies and procedures for presentation by GWA for CCU Board adoption.

**Task 4: Technical Memorandum**

**Approach:** The PMO Team will prepare a written Technical Memorandum that identifies a program to be implemented by GWA that defines applicable ordinances, codes, rules and

Guam Waterworks Authority  
Backflow Prevention and Cross-Connection Control Program

regulations, and defines the staffing resources required to implement a safe and reliable backflow prevention and cross connection control program. The TM will include recommendations for the policies and procedures to be adopted by GWA Management, standards to be adopted for new and replacement construction, acceptable equipment, manufacturers and brands to be used island-wide, and recommendations for appropriate staffing to enforce and inspect non-residential backflow prevention facilities. Staffing recommendations will be based on generally anticipated travel times for inspection routes based on PMO experience. Optimizing route travel and inspection times is excluded from this work authorization. GWA can later optimize route travel times to suit their efficiency gains. The TM will document the following information:

- a. Facilities database
- b. Introduction to cross connections and backflow prevention
- c. Statement of the cross connection control program strategy and goals.
- d. Summary of policies and legal authority
- e. Certifications required for installation and testing of backflow prevention devices
- f. Developer and customer responsibilities, and enforcement strategies and methodologies
- g. Discussion of common devices and typical applications. Provide device selection matrix based on business type, flow, and activity.
- h. Recommendations of role, staffing and responsibilities for program implementation
- i. Reference documents and useful technical guidance
- j. Record keeping and reporting procedures

**BC Responsibilities:** Develop the TM.

**GWA Responsibilities:** Review and comment on the TM.

**Products:** Draft and final TMs in electronic (PDF) format.

**SCHEDULE**

The effort described in this task order will be completed four months from the notice to proceed.

**BUDGET SUMMARY**

Labor (labor hours 880)	\$147,890
ODC	\$ 500
GRT	\$ 6,180
<hr/>	
Total	\$ 154,570



Guam Waterworks Authority  
 Backflow Prevention and Cross-Connection Control Program

**BUDGET**

This work order will be performed on a time and materials basis, and will not exceed \$154,570 without written consent from GWA.

Name	Labor Code	Labor Rate	Hours	Amount
Gilman	M	\$250	16	\$4,000.00
Matasci	M	\$250	40	\$10,000
G. Watson	F	\$140	292	\$40,880
Marble	F	\$140	112	\$15,680
S. Watson	M	\$250	174	\$43,500
Chang	M	\$250	32	\$8,000
Editor	H	\$185	34	\$6,290
Ligaya	D	\$100	152	\$15,200
Tamai	G	\$155	28	\$4,340
Labor Subtotal			880	\$147,890
<b>Other Direct Costs</b>				
<b>Description</b>				<b>Amount</b>
Airfare \$2000 from HNL			0	\$0
Rental Car \$70/day (21 days)			0	\$0
Per Diem \$250/day (21 days)			0	\$0
Materials				\$500
ODC Subtotal				\$500
<b>Total Work Order Estimate</b>				
Labor Subtotal				\$147,890
ODC Subtotal				\$500
GRT (4.167%)				\$6,183
Total				\$154,573

Guam Waterworks Authority  
State Revolving Fund (SRF) Grant Project Support Amendment No.2

**TO:** Brown and Caldwell  
414 W. Soledad Ave  
Suite 907  
Hagatna, Guam 96910

**WORK AUTHORIZATION NO.:** 2014-11-A2

**SUBMITTAL DATE:** May 11, 2016

**FROM:** Miguel C. Bordallo, PE  
GENERAL MANAGER  
GUAM WATERWORKS AUTHORITY

You are hereby authorized to perform the services described below in accordance with the Contract for Technical and Professional Services executed February 6, 2012 between Brown and Caldwell (BC) and Guam Waterworks Authority (GWA) for Program Management Services, GPA-RFP-11-005.

**DESCRIPTION OF WORK AND FEE ESTIMATES**

**DESCRIPTION:** State Revolving Fund (SRF) Grant Program Support Amendment No.2

Defined cost, scope and schedule on a time and materials basis are provided below and consist of providing project management and support for construction management, scheduling, reporting and tracking of SRF Grant and other related GWA projects for implementation in accordance with GWA's Programmatic Project Management Plan (PPMP).

NOT TO EXCEED amount: \$730,000.00

Signed



RAYMOND N. MATASCI  
SR. VICE PRESIDENT/PROGRAM MANAGER  
BROWN AND CALDWELL

Date

June 23, 2016

GWA Reviewer: \_\_\_\_\_

Date \_\_\_\_\_

Signed

\_\_\_\_\_  
MIGUEL C. BORDALLO, PE  
GENERAL MANAGER  
GUAM WATERWORKS AUTHORITY

Date \_\_\_\_\_

Guam Waterworks Authority  
State Revolving Fund (SRF) Grant Project Support Amendment No.2

**WORK AUTHORIZATION NO: 2014-11-A1**

**DESCRIPTION:** State Revolving Fund (SRF) Grant Project Support Amendment No.2

**GWA PROJECT MANAGER: Thomas F. Cruz, PE**

**PROJECT BACKGROUND AND OBJECTIVE**

In February, 2015, Brown and Caldwell (PMO) was authorized by GWA under Work Authorization No. 2014-11 to support GWA in the planning, development, review, prioritization, project management, construction management, scheduling, and tracking of State Revolving Fund (SRF) Grant projects for implementation in accordance with GWA's Programmatic Project Management Plan (PPMP). The original Work Authorization provided a budget of \$1,089,850 to perform these tasks until December 31, 2016, assuming the projects would be completed by then. The WA stated that: *"Should unforeseen delays occur, the PMO Team will bring these to the attention of GWA. Work beyond the December 31, 2016, will proceed upon written authorization from GWA."*

Under this Work Authorization, the PMO developed twelve (12) Project Implementation Plans (PIP's), reviewed three (3) PIP's developed by GWA staff and assisted GWA in development of seventeen (17) SRF project scopes and schedules. This Work Authorization initially included PMO support for ten SRF funded projects. During the planning stages of the projects, some of the projects were combined with others to provide more manageable contracts, some were determined to be less critical and removed from the list and an additional project was included. The project currently covers nine (9) active projects. All nine projects are currently underway in various phases. By request of the Public Utility Commission, funding for this effort was divided into two phases; Phase 1 was covered under WA 2014-11 for \$544,925, and Phase 2 under WA 2014-11-A1 for \$544,925.

The schedules for the projects were substantially delayed due to a variety of factors related to the project procurement process. These factors include GWA's issues related to development of equipment standardization, open competition, selection review criteria, prolonged contract award periods, and the legal opinions on design technical documents during procurement stage. The schedule was further impacted by field conditions such as the unexpected sewer collapse in the Route 1 project area and the challenges in sewer cleaning identified by the project designers and contractors due to pipe conditions and FOG buildup. Currently, one project is in construction phase, two projects are in bidding phase, and six projects are still under design (as shown below).

Guam Waterworks Authority  
 State Revolving Fund (SRF) Grant Project Support Amendment No.2

Project Description		Estimated Completion Dates		
		Design	Bidding	Construction
1	Southern SSES Rehabilitation (Agat-Santa Rita-Umatac-Merizo)	Completed	Completed	8/8/2016
2	Route 1 Asan-Adelup-Hagatna	11/14/2016	3/20/2017	5/18/2018
3	Route 2 Agat War-in-the-Pacific	9/16/2016	12/23/2016	1/12/2018
4	F and A Series Wells Rehab	8/4/2017	1/8/2018	5/22/2019
5	Tumon Sewer Hot Spots	12/31/2016	3/30/2017	1/12/2018
6	Route 4 Hagatna	1/5/2017	5/18/2017	11/5/2018
7	D-Series Wells Rehabilitation	Completed	6/8/2016	10/25/2017
8	Baza Gardens-Talafofo SSES	Completed	7/5/2016	4/11/2017
9	Tamuning Sewer Hot Spots	2/24/2017	6/16/2017	7/3/2018

To make sure the projects are completed and SRF funding deadlines are met, and continuity is maintained through the remainder of the projects, the PMO requests an extension of PMO support through December 31 2017. Further extensions for PMO support will be reviewed by GWA on an annual basis.

**SCOPE OF WORK**

This work authorization will be performed by Brown and Caldwell listed herein as the PMO Team. This scope outlines the overall PMO Team scope, schedule, and budget.

**Task 1: Task Management**

**Approach:** Brown and Caldwell's PMO staff will manage the scope, schedule, and budget associated with the work described in this Work Authorization to ensure that this work is managed in a manner that meets the intent of the GWA PMO Program Management Plan. This includes, but is not limited to, management of documents, change, risk, and quality assurance and control. This task shall include regular progress meetings and conference calls (at least every two weeks) between PMO and GWA personnel to review project progress, issues to be resolved, project reports and contractor procurement and payment procedures.

**PMO Team Responsibilities:** PMO staff will manage the scope, schedule and budget in accordance with the protocols set forth in the GWA PMO Program Management Plan.

**GWA Responsibilities:** GWA staff will attend meetings, review progress reports, and adhere to the protocols set forth in the GWA PMO Program Management Plan.

**Task 2: Project Management**

**Approach:** The PMO Team will manage assigned projects from initiation phase, through pre-design, design, bidding, construction and closeout. The PMO Team assumes a continuation of management services for the nine (9) individual SRF projects as listed in the table above.

Guam Waterworks Authority  
State Revolving Fund (SRF) Grant Project Support Amendment No.2

In accordance with Grant Conditions P3, P7, P8:

The PMO will work with the GWA Engineering group and manage projects as directed by GWA. The PMO will provide project management oversight and technical subject matter expertise for the individual projects assigned to the PMO. The PMO will handle consultant and contractor payment requests and substantiate documentation for pay requests. The PMO will prepare detailed project scopes of work, prepare RFPs for design work, provide design services during the construction stage for the PMO designed projects Nos. 1 and 8, assist with change order development, review and processing, assist GWA in submitting to USEPA, and address USEPA comments. The PMO will oversee preparation of QA/QC Plans by consultants for data collection, attend bid openings, collect bid tabs and submit to USEPA through GWA, provide written statements when and if the lowest bidder was not selected and documentation of the reasons, and provide recommendations of award.

Work to be performed:

- Provide bi-weekly progress reporting via teleconference with GWA and USEPA
- Control Costs and manage to budget
- Facilitate project team cooperation and input
- Maintain project files
- Prepare RFQ's, RFP's, Scope of services
- Assist GWA in selection of consultants
- Arrange and attend to negotiate final scope and fees meeting
- Arrange, coordinate and participate in technical reviews at initial kickoff, 30%, 60% and 90% landmarks
- Update project cost estimates at 30% and 100% design completion based on design consultant's input
- Track and report on cash flow projections
- Receive, review, distribute and return comments on technical memorandum and reports issued by design consultants
- Review design options prepared by design consultants
- Review invoices and recommend payment
- Conduct review meetings with design consultant
- Perform constructability reviews
- Obtain input and consensus from operations and maintenance divisions
- Arrange for and coordinate easement and right-of-way procurement activities
- Coordinate building permits from Dept. of Public Works
- Coordinate necessary stream buffers or 404 permits
- Coordinate USEPA review and approval as needed

In accordance with Grant Conditions P9:

The PMO will assist GWA in Federal and Territory Agency notification, SHPO notification, development of procedures for protection or salvage during construction, and obtaining SHPO concurrence. The PMO will assist GWA in selecting consultants to prepare an Archaeological monitoring, discovery and data recovery Plan, and provide project notification to the Guam Historic Preservation Officer, as necessary. Archeological and cultural resources work will be performed by others under separate contract with GWA.

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In accordance with Grant Conditions P11, P19:

The PMO will verify that procurement follows Federal Regulations as defined in the Grant conditions and maintain necessary documentation, validate contractor performance, payment and other bonds, and validate that purchase orders and contracts include appropriate clauses required by Federal statutes, regulations and Executive Orders as defined in the Grant conditions.

**PMO Team Responsibilities:** Manage projects as directed by GWA in accordance with the Grant conditions.

**GWA Responsibilities** Participate in reviews and project management of SRF-funded projects.

**Products:** Project documentation.

**Task 3: Contract and Construction Management**

**Approach:** The PMO Team will manage assigned projects from initiation phase, through pre-design, design, bidding, construction and closeout. The PMO Team assumes that the nine (9) individual projects currently assigned to the PMO will continue to require the following construction management services:

In accordance with Grant Conditions P14, P16, P17, P18, P20, P22, P23, P24:

As directed by GWA, the PMO will perform contract management, monitor contractor work plans, review cost breakdowns and schedules of values, notify USEPA of construction start, attend meetings with USEPA during construction, verify as-built drawings are being prepared by others, and submit final copies of work products to USEPA through GWA. The PMO will perform Change Order management and provide advance notification of changed conditions and budget category transfer requests to the USEPA and seek USEPA approvals.

For each infrastructure project funded by the Grant, the PMO will work with the contractor to obtain a Plan of Operation including O&M Manual, emergency operation plan, site safety plan, and personnel training plan as required.

In accordance with Grant Conditions P26, P29, P30, P34:

The PMO will assist GWA in issuing a letter at the close of the project certifying that the project meets or does not meet project performance standards. Corrective action reports and cost estimates for corrective action will be prepared, along with a schedule for corrective action. The PMO will assist GWA in meeting Federal cross-cutting requirements and conformance compliance with Federal regulations. The PMO will help GWA make sure that Davis Bacon prevailing wage determinations are included in procurements, and assist in monitoring for Davis Bacon compliance, as requested by GWA. The PMO will assist GWA in notification of Public Media Events and publicity for accomplishments.

Work to be performed:

- Arrange for and coordinate bid award activities
- Arrange groundbreaking where required
- Review Contractor prequalification and preparation of the qualified bidders list
- Manage construction management contracts

Guam Waterworks Authority  
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- Supervise and monitor the activities and schedules for materials testing consultant
- Monitor CPM Schedules
- Coordinate change orders
- Coordinate, review, approve and monitor erosion and sediment control measures
- Periodic site visits
- Monitor easement conditions
- Track RFI's, RFP's, Work Change Directives (WCD's), change orders, shop drawings and other submittals
- Assist CM's with conducting claims analysis and claims resolution
- Coordinate, review and approve payments to contractor and consultants; verify quantities
- Determine substantial completion and prepare lists of incomplete or unsatisfactory items and a schedule for their completion.
- Ensure appropriate level of communications and public outreach
- Submit fixed asset management reports to GWA
- Arrange dedication as required
- Oversee start up training provided by others
- O & M Manual Review
- Deliver all project files to GWA in digitally archived and one hard copy format
- Deliver as-built record drawings to GWA

**PMO Team Responsibilities:** Manage projects as directed by GWA in accordance with the Grant conditions.

**GWA Responsibilities** Participate in reviews and project management of SRF-funded projects.

**Products:** Project documentation

**SCHEDULE**

The PMO Team will conduct the effort described in this work authorization to support GWA in the project management, scheduling, and tracking of projects. The PMO will conduct this effort for a period from the date of the notice to proceed anticipated in October 2016, to December 31, 2017. Work beyond the December 31, 2017, will proceed upon written authorization from GWA.

**BUDGET SUMMARY**

Labor (4,479 hours)	\$691,097.00
ODC	\$9,733.00
GRT	\$29,200.00
Total	\$730,000.00

**Guam Waterworks Authority  
State Revolving Fund (SRF) Grant Project Support Amendment No.2**

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Guam Waterworks Authority  
 State Revolving Fund (SRF) Grant Project Support Amendment No.2

**BUDGET**

This work order will be performed on a time and materials basis and will not exceed \$730,000.00 without written consent from GWA.

Name	Labor Code	Labor Rate	Hours	Amount
Gilman	M	\$256	48	\$12,288
Chang	L	\$256	240	\$61,440
Matasci	N	\$256	30	\$7,680
Bilz	J	\$240	348	\$83,520
M. Smith	H	\$190	400	\$76,000
T. Myers	K	\$248	32	\$7,936
Watson	F	\$144	1560	\$224,640
Claveria	E	\$123	1500	\$184,500
Administrator	D	\$103	321	\$33,063
<b>Labor Subtotal</b>			<b>4,479</b>	<b>\$691,067</b>

**Other Direct Costs**

Description	Amount
Mileage @ \$0.54/mi (339 mi)	\$183.00
Travel and ODCs	\$9,550.00
<b>ODC Subtotal</b>	<b>\$9,733.00</b>
<b>Total Work Order Estimate</b>	
<b>Labor Subtotal</b>	<b>\$691,067.00</b>
<b>ODC Subtotal</b>	<b>\$9,733.00</b>
<b>GRT (4.167%)</b>	<b>\$29,202.00</b>
<b>Total</b>	<b>\$730,002.00</b>

# Exhibit C (1 of 1)

Figure 4-2 PMO Progress Status

