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6 **BEFORE THE GUAM PUBLIC UTILITIES COMMISSION**

7  
8 IN THE MATTER OF:

8 **GWA DOCKET NO. 23-07**

9 **PETITION TO AUTHORIZE THE**  
10 **GUAM WATERWORKS**  
11 **AUTHORITY TO ISSUE**  
12 **PROCUREMENTS FOR SEWAGE**  
13 **PUMP STATION AND FORCE**  
14 **MAIN REPAIR/REHABILITATION/**  
15 **REPLACEMENT**

9 **PETITION FOR GWA TO PROCURE**  
10 **ENGINEERING DESIGN SERVICES**  
11 **FOR SEWAGE PUMP STATION AND**  
12 **FORCE MAIN REPAIR,**  
13 **REHABILITATION, AND**  
14 **REPLACEMENT**

15 **COMES NOW**, the GUAM WATERWORKS AUTHORITY (“GWA”), by and through  
16 its counsel of record, THERESA G. ROJAS, ESQ., and hereby files its petition seeking the PUC’s  
17 approval to issue Request for Proposals (“RFP”) for Indefinite Delivery/Indefinite Quantity  
18 (“IDIQ”) engineering services for Sewage Pump Station and Force Main repair, rehabilitation,  
19 and replacement design services.  
20

21 **BACKGROUND**

22 GWA provides wastewater service to approximately 30,000 wastewater customer  
23 accounts island-wide which include Anderson Air Force Base (AFB) and other military  
24 installations in northern Guam.<sup>1</sup>  
25  
26  
27

28 <sup>1</sup> GWA Water Resources Master Plan Update, August 2018



1 GWA's public wastewater collection/transmission system includes Eighty-two (82)  
2 sewage pump stations ("SPS") and approximately Forty-Three (43) miles of force main ("FM").  
3 Most of GWA's FM pipes were constructed and installed from the 1960s to the 1990s, including  
4 FM's made from asbestos cement pipe ("ACP") FM's and are in need of repair, rehabilitation, or  
5 replacement throughout various locations island-wide. **See Exhibits A09-A012.**

6  
7 GWA's 2018 Water Resource Master Plan Update ("WRMPU") also includes SPS  
8 condition assessments identifying capacity and condition issues, and the required improvements  
9 necessary to ensure reliability of wastewater infrastructure and services. **See Exhibits A06-A08.**

10 As part of current regulatory enforcement action by the United States Environmental  
11 Protection Agency ("USEPA") for compliance with Clean Water Act standards, USEPA is  
12 requiring GWA to address current and mitigate future operational, structural and safety  
13 deficiencies for SPS and for FMs in an aggressive timeframe. In order to achieve compliance  
14 with USEPA's requirements, procurement of multiple IDIQ contracts for engineering design are  
15 needed and must be considered. These repairs and replacements will further minimize any adverse  
16 impacts to the island's water resources and the environment by upgrading GWA's wastewater  
17 system to ensure reliable sanitary sewer service to GWA customers.  
18

19  
20 The 2018 WRMPU estimated a cost of Five Million Five Hundred Forty Thousand Dollars  
21 (\$5,540,000.00) to rehabilitate ten (10) stations, correlating to Forty-Five Million Four Hundred  
22 Twenty-Eight Thousand Dollars (\$45,428,000.00) to rehabilitate eighty-two (82) stations. The  
23 estimated FM costs for FM rehabilitation and replacement ranged from Seventeen Million Three  
24 Hundred Fourteen Thousand Dollars (\$17,314,000.00) to One Hundred Sixteen Million Four  
25



1 Hundred Thirty-Five Thousand Dollars (\$116,435,000.00) respectively. See Exhibits A09-A12  
2 for replacement and rehabilitation estimates. Due to supply chain issues brought on since 2018  
3 actual costs are anticipated to exceed these WRMPU estimates. It is anticipated that the value of  
4 IDIQ engineering contracts will exceed the One Million Dollar (\$1,000,000) threshold under the  
5 contract review protocol.

### 7 REQUEST FOR APPROVAL

8 In order to improve GWA's wastewater collection and transmission system, GWA now  
9 desires to procure experienced and qualified SPS and FM engineering design firms to provide  
10 IDIQ engineering services through Request for Proposals. The RFP will be advertised to solicit  
11 and obtain experienced and qualified engineering firms to provide immediate SPS and FM design  
12 services to be used in the execution of construction and rehabilitation projects needed to meet  
13 USEPA compliance requirements under Clean Water Act standards and meet the intent of GWA's  
14 WRMPU master plan. Requests to procure construction works and contract awards and approval  
15 to design firms will be raised in separate petitions at a later time.

16  
17 In support of this Petition, the CCU approved GWA Resolution 30-FY2023 to procure  
18 engineering firm services for Sewage Pump Station and Force Main repair, rehabilitation, and  
19 replacement design. This resolution and its supporting exhibits are attached as Exhibit A and are  
20 incorporated by reference as if fully set forth herein.

### 22 CONCLUSION

23  
24 Based on the foregoing, GWA respectfully requests the PUC approve and authorize GWA  
25 management to begin its procurement for IDIQ professional engineering design services for  
26  
27  
28



1 Sewage Pump Station and Force Main repair, rehabilitation and replacement.

2 **RESPECTFULLY SUBMITTED** this day of June 22nd 2023.

3  
4 By:

  
5 **THERESA G. ROJAS**  
6 GWA General Counsel





## **GUAM WATERWORKS AUTHORITY**

"Better Water, Better Lives."

Gloria B. Nelson Public Service Building | 688 Route 15 | Mangilao, Guam 96913

Tel: (671) 300-6846/7

### **Issues for Decision**

#### **Resolution No. 30-FY2023**

Relative to Requesting Approval to Procure Engineering, Construction, and Project/Construction Management Services for Sewage Pump Station and Force Main Repair/Rehabilitation/Replacement

#### **What is the project's objective and is it necessary and urgent?**

GWA has 82 sewage pump stations (SPSs) and approximately 43 miles of force main (FM) that need to be repaired, rehabilitated, or replaced to ensure continuity of wastewater service and to prevent discharges to the environment. The necessity of these improvements have been documented in the 2018 Water Resources Master Plan and are both necessary and urgent to address an anticipated Consent Decree or other enforcement action with the United States Environmental Protection Agency.

Engineering design and project/construction management services will be procured through indefinite delivery/indefinite quantity contracts. Construction services will be procured through multiple invitations for bids (IFBs), with each IFB covering multiple SPSs and FMs.

#### **Where is the location?**

Island-wide.

#### **How much will it cost?**

The 2018 Water Resources Master Plan Update estimated a cost of \$5,540,000 to rehabilitate ten SPSs (a cost of \$554,000 per SPS). The WRMP also estimated FM costs ranging from \$17,314,000 for FM rehabilitation to \$116,435,000 to replace FMs. However, construction costs since 2018 have greatly increased and are anticipated to exceed the 2018 cost estimates.

#### **When will it be completed?**

Thirty-three SPSs are anticipated to be completed within 10 years. The remaining SPSs will be scheduled to meet USEPA deadlines.

Approximately 11 miles of FMs are anticipated to be completed within 10 years. The remaining FM work will be scheduled to meet USEPA deadlines.

#### **What is the funding source?**

Bonds and grants

#### **The RFP/BID responses (if applicable):**

NA





**CONSOLIDATED COMMISSION ON UTILITIES**  
Guam Power Authority | Guam Waterworks Authority  
P.O. Box 2977 Hagatna, Guam 96932 | (671)649-3002 | guamccu.org

**GWA RESOLUTION NO. 30-FY2023**

**RELATIVE TO REQUESTING APPROVAL TO PROCURE ENGINEERING,  
CONSTRUCTION, AND PROJECT/CONSTRUCTION MANAGEMENT SERVICES  
FOR SEWAGE PUMP STATION AND FORCE MAIN  
REPAIR/REHABILITATION/REPLACEMENT**

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

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

**WHEREAS**, GWA’s public wastewater collection/transmission system includes Eighty-two (82) sewage pump stations (SPS) and approximately Forty-Three (43) miles of force main (FM); and

**WHEREAS**, GWA’s 2018 Water Resources Master Plan Update (WRMPU) includes SPS condition assessments (see Exhibit A) identifying actions needed to ensure continuity of wastewater service; and

**WHEREAS**, most of GWA’s FMs were constructed from the 1960s to the 1990s, including asbestos cement pipe force mains, and are in need of repair, rehabilitation, or replacement in various locations island-wide, as identified in the WRMPU (see Exhibit B); and

**WHEREAS**, GWA endeavors to enter into contracts to repair, rehabilitate, or replace SPSs and FMs for the protection of human and environmental health, and in anticipation of a consent decree or other enforcement action with the United States Environmental Protection Agency (USEPA); and



1       **WHEREAS**, funding is available through bonds identified on the GWA Capital  
2 Improvements Plan and grants; and

3  
4       **WHEREAS**, GWA is seeking to advertise requests for proposals (RFPs) for experienced  
5 and qualified SPS and FM designers to provide Indefinite Delivery–Indefinite Quantity (IDIQ)  
6 engineering services; and

7  
8       **WHEREAS**, GWA is seeking to advertise invitations for bid (IFB) for experienced and  
9 qualified SPS and FM contractors to provide construction services while ensuring continuity of  
10 sewer service to customers and minimizing adverse impacts to the island, with each IFB scope to  
11 include multiple SPSs and FMs; and

12  
13       **WHEREAS**, GWA is seeking to advertise RFPs for experienced and qualified  
14 professionals to provide IDIQ project/construction management services to support SPS and FM  
15 construction; and

16  
17       **WHEREAS**, due to the number of SPSs and FMs, and in order to meet potential USEPA  
18 compliance deadlines, multiple contracts per IDIQ procurement and construction procurement  
19 will be considered; and

20  
21       **WHEREAS**, the 2018 WRMPU estimated a cost of Five Million Five Hundred Forty  
22 Thousand Dollars (\$5,540,000.00) to rehabilitate Ten (10) stations, correlating to Forty-Five  
23 Million Four Hundred Twenty-Eight Thousand Dollars (\$45,428,000.00) to rehabilitate Eighty-  
24 Two (82) stations (Appendix A); and

25  
26       **WHEREAS**, the 2018 WRMPU estimated FM costs ranging from Seventeen Million  
27 Three Hundred Fourteen Thousand Dollars (\$17,314,000.00) for FM rehabilitation to One  
28 Hundred Sixteen Million Four Hundred Thirty-Five Thousand Dollars (\$116,435,000.00) to  
29 replace FMs (Appendix B); and

30  
31 //



1       **WHEREAS**, construction costs have greatly increased since 2018 due to supply chain  
2 issues and actual costs are anticipated to exceed the WRMPU estimates; and

3  
4       **WHEREAS**, the Public Utilities Commission (PUC) contract review protocol requires  
5 GWA to obtain approval prior to advertising procurement for projects with an anticipated value  
6 of One Million Dollars (\$1,000,000.00) or greater; and

7  
8       **WHEREAS**, the CCU must approve all petitions to the PUC.

9  
10       **NOW BE IT THEREFORE RESOLVED**, the Consolidated Commission on Utilities  
11 does hereby approve the following:

- 12           1. The recitals set forth above hereby constitute the findings of the CCU.  
13           2. The CCU finds that procurement for engineering, construction, and  
14           project/construction management services for the repair, rehabilitation, or  
15           replacement of SPSs and FMs are necessary for the protection of human and  
16           environmental health, and to meet the anticipated consent decree or other  
17           enforcement action with the United States Environmental Protection Agency.  
18           3. The CCU hereby authorizes management to submit a petition to the PUC for  
19           the procurement of engineering, construction, and project/construction  
20           management services for SPS and FM repair, rehabilitation, and replacement.

21  
22       **RESOLVED**, that the Chairman certified, and the Board Secretary attests to the adoption  
23 of this Resolution.

24  
25       **DULY AND REGULARLY ADOPTED**, this 30<sup>th</sup> day of May 2023.

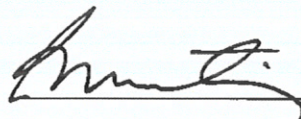
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27       Certified by:

28       

29       **JOSEPH T. DUENAS**

30       Chairperson

31       Attested by:



**PEDRO ROY MARTINEZ**

Secretary



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

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# EXHIBIT A

Table 6-2. Lift Station Condition Assessment

Station	Electrical			Health and Safety			Capacity		Building and Site			Station			Other			Maintenance Difficult					
	No Generator Present	Generator Needs Repair or Replacement	Control Systems, Alarms, or SCADA Problem	Other (including lighting)	Ventilation Needed	Railings Needed	Eye Wash Stations Needed	Guarding/ Hatches Needed	Backup Pump(s) Needed	Under Capacity	General Building (e.g. painting, rustproofing, spalling)	Water Supply Needed	Road, Fencing, or Other Site Access Problem	Crane/ Lift Needed	New Station Needed	Entire Station Rehabilitation Needed	Wet Well Too Small		Is or Was Ejector Station, Upgrade Needed	Comminutor, Screen, or Grit Removal Needed	Flow Meter Needed	Piping and/or Valve Issues (e.g. needs painting or rusty)	Other Equipment Corrosion
Agat-Santa Rita Basin																							
Agat Chailgan Talefac (Chailgan)			X	X	X	X	X		X		X											X	X
Pagachao			X	X		X	X		X						X								
Tipalao									X														
Baco Gardens Basin									X		X	X											
Main Trunk Line			X	X	X	X	X		X		X											X	X
Talohito									X		X												
Hagkila Basin									X		X												
Alupang Cove				X		X			X		X												
Asan									X		X												
Barnigala									X		X												
Sayside				X					X		X												
Casamiro									X		X												
Chalan Pago PS 3									X		X												
Chalan Pago PS 5									X		X												
Commercial Port			X	X					X		X										X	X	
Dairy Road									X		X							X					
Hagkila Main			X	X	X				X		X												
Hamon			X	X					X		X												
Layang				X					X		X												
Maita				X					X		X												
Mamajaniao				X					X		X												
Manglao				X					X		X												
Mongmong Toto									X		X												
Nano Yona				X					X		X												
New Chast			X						X		X												
Ordot									X		X												
Pago Double Shaft		X		X					X		X												
Passo De Oro			X	X					X		X										X	X	
Phi			X	X					X		X												
Sinajala			X						X		X												



Table 6.2. Lift Station Condition Assessment

Station	Electrical			Health and Safety			Capacity		Building and Site				Station				Other							
	No Generator Present	Generator Needs Repair or Replacement	Control Systems, Alarms, or SCADA Problem	Other (Including lightning)	Ventilation Needed	Railings Needed	Eye Wash Stations Needed	Gratings/Hatches Needed	Backup Pump(s) Needed	Under Capacity	General Building (e.g. painting, rustproofing, spalling)	Water Supply Needed	Road, Fencing, or Other Site Access Problem	Crane/Lift Needed	New Station Needed	Entire Station Rehabilitation Needed	Wet Well Too Small	Is or Was Ejector Station, Upgrade Needed	Comminutor, Screen, or Gate Removal Needed	Flow Meter Needed	Piping and/or Valve Issues (e.g. needs painting or rusty)	Other Equipment Corrosion	Maintenance Difficult	
Tai Mangdao					X				X	X									X		X			
Toto Gardens		X				X		X	X															
Ypao			X	X	X				X	X	X				X	X		X					X	
Inarajan Basin																								
Inarajan						X			X	X	X											X		
Inarajan Main						X			X		X											X		
Northern District Basin																								
Latte Heights Double Tree			X	X	X				X		X				X				X		X			
Latte Heights Submainline			X	X					X		X		X		X		X					X		
Latte Plantation			X		X				X		X								X					
Machansanoo			X	X	X			X	X	X	X		X							X				
Pacific Latte		X	X	X					X	X	X		X								X			
PGD			X	X	X				X															
Sunrise Villa			X						X				X				X							
Unstated-Mezzo Basin																								
Ejector Station No. 2			X	X	X				X		X						X	X			X			
Ejector Station No. 3			X	X	X				X		X						X	X			X			
Ejector Station No. 5			X	X	X				X		X							X						
Ejector Station No. 6			X	X	X				X		X							X						
Ejector Station No. 7			X	X	X				X		X							X						
Pump Station No. 11					X				X		X													
Pump Station No. 12					X				X		X							X						
Pump Station No. 13					X				X		X													
Pump Station No. 14					X				X		X													
Pump Station No. 15					X				X		X													
Pump Station No. 16					X				X		X													
Pump Station No. 17					X				X		X								X					
Pump Station No. 18					X				X		X													
Reyes	X								X		X													



Lift Station Rehabilitation/Replacement Program		
Project Number	MP-WW-Pump-01	Basin All
Description	<p>Rehabilitate and replace lift stations based on the capacity and condition assessment risk analysis. Lift stations should be grouped into projects and GWA should put the projects out to bid to be fixed by a qualified contractor. The projects should include a contract every two years with lift stations selected based on current information for each project. This project includes adding minor features such as pump hoists, odor control, grit removal, etc. at existing pump stations.</p> <p>The first group of projects should include adding grit removal before the Route 16 lift station as a high priority rehabilitation project.</p>	
Justification	<p>The model identified capacity issues and GWA operations found deficiencies at lift stations during condition assessment site visits. Continuation of CIP Project WW 09-01.</p>	
Proposed Schedule	<p>Begin Design: 2020 (rehabilitation of 10 lift stations every 2 years)</p>	
Cost Estimate	<p>\$5.54M (assuming rehabilitation of 10 lift stations every 2 years)</p>	
Reference Documents	<p>See lift station prioritization list in WRMPU Volume 3, Section 6.2</p>	

*This proposed project is subject to change. Projects will generally include an engineering study, detailed design, and field verification to refine the exact project scope and budget. Costs are presented in 2017 dollars and do not account for increases due to inflation and escalation. See Volume 1, Appendix D for cost estimate assumptions.*



# EXHIBIT B

Table 5-5. Force Main Renewal Prioritization

Force Main Lift Station	Basin	Diameter (inches)	Length (feet)	Material <sup>a</sup>	Installation Year	Failure Score (1 to 5)		Risk (1 to 100)	Full Replacement (1,000s of dollars) <sup>b</sup>	Targeted Rehabilitation/ Replacement (1,000s of dollars)
						Likelihood	Consequence			
Known Poor Condition										
Hagåtña Main	Hagåtña	24	2,724	Reinforced concrete	1965	Known issue	4.9		\$7,399 <sup>c</sup>	\$449
Asan	Hagåtña	12	2,993	Cast iron	1971	Known issue	2.8		\$2,327	\$347
High Priority (Likelihood >= 3, Consequence >= 3)										
Bayside	Hagåtña	6	646	ACP	1966	5.0	3.6	100	\$411	\$67
Pago Double Shaft	Hagåtña	8	2,474	ACP	1973	4.9	3.2	85	\$1,682	\$267
Mamajanao	Hagåtña	14	1,186	Unknown	1971	3.2	4.4	77	\$925	\$144
Barrigada	Hagåtña	14	6,078	ACP	1978	3.9	3.1	67	\$4,742	\$736
High Likelihood (Likelihood >= 3, Consequence < 3)										
Manglao	Hagåtña	10	2,739	ACP	1974	4.5	2.8	68	\$1,989	\$301
Piti	Hagåtña	9.1	4,336	ACP	1971	4.5	2.6	64	\$3,148	\$476
Tai Mangliao	Hagåtña	8	1,618	ACP	Unknown	3.4	2.7	51	\$1,100	\$174
Pump Station No. 17	Umatac-Merizo	6	2,840	Ductile iron	1980	3.9	2.3	50	\$1,807	\$295
Paseo De Oro	Hagåtña	6	686	ACP	1967	5.0	1.8	49	\$436	\$71
Dairy Road	Hagåtña	6	3,616	Ductile iron	1983	3.1	2.5	42	\$2,301	\$376
Pump Station No. 16	Umatac-Merizo	6	1,095	Ductile iron	1980	3.1	2.5	42	\$697	\$114
Maite	Hagåtña	4	393	Unknown	1971	3.2	1.7	29	\$250	\$41
Harmon	Hagåtña	6	2,260	Unknown	1972	3.2	1.5	26	\$1,438	\$235
Highly Critical (Likelihood < 3, Consequence >= 3)										

Brown and Caldwell



Table 5-5. Force Main Renewal Prioritization

Force Main Lift Station	Basin	Diameter (inches)	Length (feet)	Material <sup>a</sup>	Installation Year	Failure Score (1 to 5)		Risk (1 to 100)	Full Replacement (1,000s of dollars) <sup>b</sup>	Targeted Rehabilitation/ Replacement (1,000s of dollars)
						Likelihood	Consequence			
Fujita	Tumon	18	7,154	Ductile Iron	1992	3.0	3.7	62	\$6,365	\$982
Route 16	Northern District	30	5,741	Unknown	1989	2.1	5.0	59	\$7,768	\$1,126
Yigo	Northern District	16	3,077	Polyethylene	1973	2.8	3.5	54	\$2,559	\$394
Chaligan	Agat-Santa Rita	16	6,352	Ductile Iron	1995	2.6	3.1	44	\$5,282	\$813
Ypao	Hagåtña	7.3	1,741	PVC	Unknown	1.7	3.9	37	\$1,184	\$188
Lower Priority (Likelihood < 3, Consequence < 3)										
Inarajan Main	Inarajan	8	3,893	Unknown	1984	2.7	2.9	42	\$2,646	\$419
Southern Link	Northern District	36	4,311	Ductile Iron	1992	2.6	2.9	41	\$6,999	\$980
Inarajan	Inarajan	4	505	Unknown	1984	2.7	2.5	36	\$321	\$53
Commercial Port	Hagåtña	6	8,672	Cast Iron	2001	2.5	2.5	33	\$5,517	\$902
Pump Station No. 12	Umatac-Merizo	6	1,619	Unknown	Unknown	3.0	2.0	32	\$1,030	\$168
Pagachao	Agat-Santa Rita	4	27	Unknown	Unknown	2.1	2.6	30	\$17	\$3
Ejector Station No. 2	Umatac-Merizo	4	225	PVC	1980	2.2	2.5	30	\$143	\$23
Sinajana	Hagåtña	4	302	Cast Iron	Unknown	3.0	1.8	30	\$192	\$31
Mongmong-Toto	Hagåtña	8	1,334	Polyethylene	1972	2.8	1.9	29	\$907	\$144
Toto Garden	Hagåtña	4	2,748	Unknown	1988	2.1	2.5	29	\$1,748	\$286
Pump Station No. 14	Umatac-Merizo	8	466	PVC	1980	2.2	2.2	28	\$317	\$50
Pump Station No. 15	Umatac-Merizo	8	1,687	PVC	1980	2.2	2.2	28	\$1,147	\$182
New Chaot	Hagåtña	20	2,319	PVC	1989	1.7	2.9	28	\$2,510	\$371

Brown and Caldwell



Table S-5. Force Main Renewal Prioritization

Force Main Lift Station	Basin	Diameter (inches)	Length (feet)	Material <sup>a</sup>	Installation Year	Failure Score (1 to 5)		Risk (1 to 100)	Full Replacement (1,000s of dollars) <sup>b</sup>	Targeted Rehabilitation/ Replacement (1,000s of dollars)
						Likelihood	Consequence			
Pump Station No. 11	Umatac-Merizo	6	1,249	Unknown	Unknown	2.1	2.3	27	\$795	\$130
Reyes	Umatac-Merizo	4	703	Unknown	1994	2.1	2.3	27	\$447	\$73
Gaan	Agat-Santa Rita	16	10,125	PVC	1995	1.7	2.9	27	\$8,420	\$1,295
Alupang Cove	Hagåtña	6	905	PVC	1991	1.7	2.8	26	\$576	\$94
Pump Station No. 18	Umatac-Merizo	6	1,575	PVC	1980	2.2	2.1	26	\$1,002	\$164
Ypaopao	Northern District	8	989	Unknown	Unknown	2.1	2.0	23	\$672	\$107
Ejector Station No. 5	Umatac-Merizo	4	188	Unknown	1980	2.7	1.5	22	\$120	\$20
Sunrise Villa	Northern District	3	1,571	Unknown	1981	2.7	1.5	22	\$1,000	\$163
Talofofo	Baza Gardens	10	8,849	PVC	1994	1.7	2.2	20	\$6,424	\$971
Machteche	Northern District	6	825	Unknown	Unknown	2.1	1.7	20	\$525	\$86
Latte Heights Submarine	Northern District	8	1,283	Unknown	Unknown	2.1	1.6	19	\$872	\$138
Machanaonao	Northern District	6	987	Polyethylene	1992	1.7	2.0	19	\$628	\$103
Tipalao	Agat-Santa Rita	16	11,076	PVC	1995	1.7	2.0	19	\$9,211	\$1,417
PGD	Northern District	6	4,569	PVC	Unknown	1.7	2.0	18	\$2,907	\$475
Santa Ana	Northern District	8	189	Unknown	Unknown	2.1	1.4	17	\$128	\$20
Casamiro	Hagåtña	8	263	Unknown	Unknown	2.1	1.4	17	\$179	\$28
Latte Heights Double Tree	Northern District	12	1,424	Unknown	Unknown	2.1	1.4	17	\$1,107	\$165
Namo Yona	Hagåtña	8	317	Unknown	Unknown	2.1	1.4	17	\$215	\$34
Astumbo No. 1	Northern District	8	109	PVC	1993	1.7	1.8	17	\$74	\$12

Brown and Caldwell



Table 5-5. Force Main Renewal Prioritization

Force Main Lift Station	Basin	Diameter (inches)	Length (feet)	Material <sup>a</sup>	Installation Year	Failure Score (1 to 5)		Risk (1 to 100)	Full Replacement (1,000s of dollars) <sup>b</sup>	Targeted Rehabilitation/ Replacement (1,000s of dollars)
						Likelihood	Consequence			
Latte Plantation	Northern District	4	115	PVC	1982	2.2	1.3	16	\$73	\$12
Pacific Latte	Northern District	4	894	PVC	1986	2.2	1.3	16	\$569	\$93
Ordot	Hagåtña	4	1,291	PVC	1994	1.7	1.7	16	\$821	\$134
Chalan Pago PS 3	Hagåtña	10	1,045	Polyethylene	1992	1.7	1.6	15	\$759	\$115
Astumbo No. 2	Northern District	8	376	PVC	1993	1.7	1.4	14	\$256	\$41
Chalan Pago PS 5	Hagåtña	8	904	Polyethylene	1992	1.7	1.4	14	\$615	\$97
Main Trunk Line	Baza Gardens	4	573	PVC	1996	1.7	1.3	12	\$365	\$60
Leyang	Hagåtña	8	548	PVC	2004	1.2	1.6	10	\$373	\$59
<b>Total</b>			<b>140,799</b>						<b>\$116,435</b>	<b>\$17,314</b>

a. ACP = asbestos cement pipe

b. The replacement costs assume replacement due to condition at the same diameter. The costs may differ in other sections where the force mains are recommended for upsizing due to capacity.

c. The replacement cost is based on replacing the existing 24-inch with a new 42-inch pipeline. See the project description for project MP-VW-MP-04 in Section 1.1 for more details.