



BARBADOS WATER AUTHORITY

Request for Proposals (RFP)

Provision of Professional Services

for NRW Assessment,

Strategy Review and Strategy Development

BACKGROUND

For many years the Barbados Water Authority (BWA) has sought to establish a non-revenue water (NRW) reduction strategy to reduce NRW levels. Significant work has already been carried out on addressing apparent losses in the system. Between 2014 and 2016 more than ninety thousand (90,000) domestic and commercial mechanical meters were replaced by smart meters. Therefore, this program will primary focus on physical losses from the distribution network.

The island comprises of 2500 Km of pipeline laid across the 167Km² of land area. These transmission and distribution pipelines range in size from 2" to 21". Pipeline materials include a small percentage of asbestos and galvanise pipes in addition to cast iron, ductile iron, pvc and HDPE pipes. Approximately 23% of the mains are thought to be of cast iron material posing a significant problems of breakage due to their age and lead joint assembly.

A preliminary water balance by Halcrow in 2012 calculated the NRW level at 43%, with real losses being 36%. With more than one thousand reported bursts per month on service connections and up ninety bursts per month from the larger mains, the resultant water loss from these bursts is unsustainable and unacceptable, for a water scarce country.

As a critical part of its NRW reduction strategy, the BWA is embarking on the critical task of completing the establishment of District Metered Areas (DMAs) and installation of production meters at all pump stations through-out the island by the end of the year 2021. The focus on the establishment of DMAs is to facilitate the determination of the baseline conditions to support subsequent NRW reduction works and prioritisation of the works.

An initial step in the development of the DMAs will be the installation of metering points as the first course of action in determining the losses in the defined areas through the establishment of baseline data. The data that will be gathered from these efforts will allow the BWA to quantify the volume of water being lost, the origin of the losses and the reasons for the losses e.g. aging infrastructure, theft, meter reading errors etc.

Using a hydraulic network model, preliminary thirty-nine (39) DMA were demarcated. The BWA is in the process of finalizing the establishment of thirty (33) of the DMAs that were initially created through the hydraulic network modelling. Continued refinement has led to the establishment of some Sub-DMAs based on the population density of the individual DMAs. To date most DMAs have been fully or partially established. The majority of the DMAs have been established. Approximately five (5) DMAs are in need of review through desktop study and field review.

To expedite the completion and conduct of above works, the BWA is seeking to team up with a Firm or team of Consultants with competence and experience in conducting NRW loss reduction

projects and hydraulic network modelling, based on a hybrid model between full contractor's control and co-management approach.

OBJECTIVES OF ASSIGNMENT

At the end of the contracting period under this TOR, the Contractors are required to:

1. Complete construction and installation of DMAs and production meters including the procurement and installation of valves and meters in purpose constructed meter chambers.
2. Prepare a Roadmap for NRW reduction implementation action plan, including information technology requirements, suggestions for funding and managing the system as well as training of the BWA NRW Department personnel.
3. Update, calibrate and verify hydraulic network model.
4. Review current pumping, operation and design philosophies with regard to the water supply networks and make recommendations for improving operational and energy use efficiencies. (eg. use of transmission mains to fill reservoirs versus floating system arrangement).
5. Assess the suitability of the pipe material used for services (polyblue) and suggests another material suitable to the climatic conditions to which it will be subjected.
6. Assess the method of probe installations and the associated materials used, to eliminate galvanic corrosion.
7. Prepare Standard Operating Procedures for all operations to be undertaken in the Distribution network.
8. Provide training for plumbers, to ensure a consistent standard of work amongst crews working in the distribution system.

SCOPE OF WORKS

To achieve the above objectives the consultant will be required to:

1. Assess the "as is situation" through data collection and analysis of existing data, field tests on existing infrastructure assets to estimate level of commercial and physical losses.
2. Complete the installation of DMAs in collaboration with BWA personnel and other contractors.
3. Conduct sample survey for determining customer consumption volumes.
4. Establish current annual levels of NRW for each DMA with breakup of commercial and physical losses and economic loss to the BWA.
5. Evaluate options for implementation of NRW reduction strategy.

6. Develop a 3 to 5 year strategy for structured control and reduction of NRW in a phased manner (short term, Medium Term and Long term) with detailed action plan and costs involved.
7. Prepare current water balance as per International Water Association (IWA) methodology.
8. Provide roadmap for improvement in current system to achieve the objectives.
9. Evaluate the economic and hydraulic benefits of converting the current system of filling the reservoirs by floating arrangements to direct filling through dedicated transmission mains including the identification of the required changes to existing system to maintain 24 hour supply to the customers at adequate pressures.
10. Conduct cost benefit analysis and an Energy Audit of current pumping system versus proposed changes in item 8.

SCHEDULE FOR RFP PROCESS

RFP issued	June 16, 2021
Proposals Due date	July 14, 2021
Notification of Successful Responder	July 21, 2021
Contract Completion	December 21, 2021

Commencement Date for the project will be from the date of receipt of the Notice to Proceed (NTP). The period of implementation will be a period of five (5) months.

OUTPUTS AND DELIVERABLES.

Report	Time Line	Documents	Deliverables & Contents
Inception Report	End of 15 days from project commencement date		Inception report shall describe how to implement Approach and Methodology, work schedule and manpower proposed in the proposal.
First Interim Report	End of first month from commencement date.		Complete the collection and analysis of existing data, assess “As is situation, prepare maps and descriptions of all DMAs, bill of quantities and procure items. Review Existing Hydraulic Network Model and data requirements for calibration and verification. Technical report: Description and maps of DMAs.
Second Interim Report	End of second month from commencement date		Conduct customer surveys, install DMAs, describe water losses by DMAs and develop a strategy for structural control and reduction of NRW in a phased manner. Commencement of model calibration.
Third Interim Report	End of third month from commencement date		Report on reasons for water losses and prepare forecast for reduction of Commercial and Physical losses. Continued Installation of DMAs Technical Report: Roadmap and Strategy for Structural control and Reduction of NRW
Fourth Interim Report	End of Fourth month from commencement date		Evaluation of current system of filling reservoirs through floating system including energy audits. Complete DMA installations. Complete Hydraulic Network model calibration and verification
Fifth Interim Report	End of Fifth month from commencement date		Evaluation of changes to current system of filling reservoirs through floating system to direct filling through transmission mains. Technical report: Cost/Benefit Analysis and Energy Audit including details on improvements required to achieve the objectives

Sixth Interim Report	End of sixth month from commencement date		<p>Draft Final Report. Shall include all necessary technical information in appendices as well as summary of methodologies used, assumptions made and input data and final results of such studies. The report will also summarise the IWA standard water balance, based on the usual data collection and verification combined with a bottom up leakage assessment. Error margins for each of the water balance components shall be stated.</p> <p>The NRW reduction strategy shall include description of the NRW assessment activities and their results, water balance and performance indicators, institutional and human resource capacity issues and equipment requirements, NRW Management analysis of alternatives and options for commercial and physical loss reduction.</p> <p>The Hydraulic network modelling component shall details of the findings of the analysis for any changes, listing of required mains to be changed, reservoir capacity, pumping capacity changes and ability to maintain required pressures and flows.</p>
Seventh Interim Report	End of seventh month from commencement date		<p>Final Report. Shall include comprehensive summaries of previously submitted reports and appendices as per scope of works and recommendations on what should be outsourced and type of contract to use.</p>

EXPERTISE AND INPUT

The Consultant should be able to demonstrate the qualifications and experience as described below;

Core Team:

Position	Minimum Qualification	Experience
Team Leader	Graduate in Civil Engineering with post graduate PHE/ Asset Management or equivalent	<ul style="list-style-type: none"> • 15 years professional experience • Project Manager/Team Leader of large water supply projects • Design and restructuring of distribution networks • Experience in operation and Maintenance of urban water supply systems
NRW Management/ Leak Detection Specialist		<ul style="list-style-type: none"> • 15 years professional experience • Hands-on- leak detection experience • Familiar with all types of leak detection equipment
Hydraulic Network Modeller	Graduate in Civil Engineering with post-graduate training in hydraulics and network modelling	<ul style="list-style-type: none"> • 10 years professional Experience • Hands-on experience in development, calibration, verification and use

		of hydraulic network models
Finance Specialist	Post graduate in Commerce/Finance/Economics/CA	<ul style="list-style-type: none"> • 10 years professional experience • Experience in utility finance and accounts having knowledge in economic analysis of infrastructure projects
Other Staff	The consultant may propose appropriate support staff as per the requirements of the scope of works.	

COORDINATION REQUIREMENTS

All processes will need to be coordinated with BWA’s Project Coordinator who will need in some instances to facilitate access or to provide guidance in relation to the implementation of infrastructure or completion of drawings.

LAWS, REGULATIONS, STANDARDS

All work is to be carried out in accordance with industry standards. Health and Safety procedures should be followed when undertaking all tasks as required. All end products should be to a standard acceptable to the BWA.

RESOURCES PROVIDED.

The BWA will provide:

1. Relevant Counterpart BWA staff to assist with the process of geo-referencing of BWA appurtenances.
2. Access to BWA work sites and existing records will be provided as necessary to approved persons.

In addition the results and deliverables listed above

Contractor will provide:

1. All manpower, materials and equipment necessary for carrying out the assignments.

2. All report production and necessary translation.
3. Arrange for transportation and travelling required.

CRITERIA FOR SELECTION/EVALUATION PROCESS

The BWA is seeking a qualified consultant (firm) that has a firm understanding of water loss control efforts in the water sector. Responses to the RFP are expected to describe how you will complete the scope of work and demonstrate previous and relevant experience. The BWA will evaluate the proposals on 100-point scale based on the criteria below:

- Understanding of the work to be performed (20 points)
- Qualifications and experience of staff (40 points. For example
 - Experience with water loss control efforts including AWWA's M36 and Water Loss Control Methodology, International Water Association Methodology
 - Experience with developing Roadmaps and guidance modules for Water Loss control efforts
 - Prior experience in conducting similar work
- Demonstration of ability to complete the work including submission of all deliverables by December 21, 2021 (15 points)
- Proposal Budget/costs (15 points.
- References (10 points)

During its evaluation of the various proposals submitted, the BWA reserves the right to request additional information or clarification from the responders related to the RFP. Top responders may be required to make presentations to the BWA's Project Steering Committee.

SOURCE OF FUNDING

Funding is provided by the Government of Barbados to facilitate these works.

INSTITUTIONAL RESPONSIBILITIES

- i. The BWA's NRW Department will be the lead department involved in the execution of these works in collaboration with the Contractor.
- ii. The BWA's NRW Department will be responsible for liaising with any other government agencies or customers.

SUBMITTAL FORMAT AND REQUIREMENTS.

Proposal submitted in response to this RFP shall be no longer than 20 pages in 12-point font (excluding qualifications, resumes and supporting documents) Please submit only a PDF version of your proposal by email to:

**The Chairman
Tenders Committee**

bwatenders.committee@bwa.gov.bb

All proposals responding to this RFP shall include the following:

1. **Transmittal Letter** on official business letterhead including:
 - a. Name of responder submitting the proposal
 - b. Name, title, address, telephone number and e-mail address of person to contact for further information.
 - c. Name, title, address, telephone number and e-mail address of the individual authorised by the responder to contractually oblige the responder's organisation.
2. **Project Manager and Staff:** Describe the experience of the individuals who will be and indicate assigned to the project. Describe the qualifications of each individual and include a brief resume or summary paragraph for each individual.
3. **Organisation:** Provide a brief summary of the responder's organisation and indicate how many years the organisation has been providing these services.

PAYMENT SCHEDULE

A payment schedule will be agreed based on a proposed request from the engaged contractor. An advance payment of 25% of the estimated cost of the works will be provided to the contractor for mobilisation.

PAYMENT RETENTION

A 10% retention fee will be applied to the payment structure. This shall be retained from every progress payment. Upon successful completion of the works the retention fee will be paid to the contractor.

LIQUIDATED DAMAGES

Where the engaged contractor fails to satisfactorily complete the work within the specified contract time or any additional time granted, liquidated damages shall be owed to the BWA.