

BERYL EMERGENCY RESILIENCE RECOVERY PROJECT

REQUEST FOR EXPRESSIONS OF INTEREST

ST. VINCENT AND THE GRENADINES BERYL EMERGENCY RESILIENCE RECOVERY PROJECT

Loan No.: IDA 76430

Assignment Title: *Design Consultancy and Technical Assistance for the Construction of Reverse Osmosis Desalination Plants in Union Island and Mayreau, Saint Vincent and the Grenadines*

Reference No.: SVG-BERRY-CS-QCBS-03

The Government of Saint Vincent and the Grenadines has received financing from the World Bank toward the cost of the Beryl Emergency Resilience Recovery Project and intends to apply part of the proceeds for consulting services for the Design Consultancy and Technical Assistance for the Construction of Reverse Osmosis Desalination Plants in Union Island and Mayreau, St. Vincent and the Grenadines.

The consulting services (“the Services”) include

1. Scope and delivery framework: Define the Consultant’s full scope of services for the delivery of Saltwater Reverse Osmosis (SWRO) Desalination systems on Union Island and Mayreau.
2. Environmental and Social Framework Management: Assess and manage environmental and social risks through site-specific Environmental and Social Impact Assessments (ESIA), Environmental and Social Management Plans (ESMP), and Resettlement Action Plans (RAP), where required.
3. Plant design: Prepare complete plant designs covering intake works, brine discharge, photovoltaic power supply, storage, pumps, civil and electrical works, and operation and maintenance requirements.
4. Hydraulic system review: Review and improve CWSA’s existing hydraulic designs to support reliable water supply, demand forecasting, storage, pumping, distribution, SCADA functionality, and overall system resilience.

5. Procurement support: Prepare tender documents, Bills of Quantities, and Technical Specifications, and assist with bidder clarifications, Bid evaluations, and Contract award recommendations.
6. Construction supervision and commissioning: Supervise construction through site inspections, progress monitoring, ESMP compliance checks, payment certification, commissioning, pre-operation support and final acceptance.

The Terms of Reference (TOR) for the primary procurement stage for the assignment *are attached to this request for expressions of interest.*

The Ministry of Finance and Economic Planning now invites eligible consulting firms (“Consultants”) to indicate their interest in providing the Services. Interested Consultants should provide information demonstrating that they have the required qualifications and relevant experience to perform the Services. The shortlisting criteria are:

1. Relevant Firm Experience in Water Supply and Treatment Infrastructure. The firm should demonstrate at least 8 years of relevant experience in water supply or water treatment infrastructure, including successful completion of at least two similar desalination or water treatment projects of comparable size and complexity within the last 10 years.
2. Experience in Coastal and or Island Projects and be knowledgeable in applicable standards. The firm should demonstrate experience working in small-island or coastal environments, including familiarity with World Bank environmental and social safeguards processes, drinking water quality standards, and international desalination and engineering standards.

Key Experts will not be evaluated at the shortlisting stage.

The attention of interested Consultants is drawn to Section III, paragraphs, 3.14, 3.16, and 3.17 of the World Bank’s “Procurement Regulations for IPF Borrowers” 5th Edition September 2023 (“Procurement Regulations”), setting forth the World Bank’s policy on conflict of interest. In addition, Consultants shall refer to the following requirements on conflict of interest related to this assignment as per paragraph 3.17 of the Procurement Regulations.

Consultants may associate with other firms to enhance their qualifications but should indicate clearly whether the association is in the form of a joint venture and/or a sub-consultancy. In the case of a joint venture, all the partners in the joint venture shall be jointly and severally liable for the entire contract, if selected.

A Consultant will be selected in accordance with the Quality Cost Based Selection method as set out in the Procurement Regulations and to be specifically set out in the Request for Proposals.

Further information can be obtained at the address below during office hours **09:00 am to 4:00 pm EST**

Expressions of interest must be delivered in a written form to the address below (in person, or by mail, or by fax, or by e-mail) by **Wednesday, 2nd September 2026**.

Attn: Recardo Frederick
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BERYL EMERGENCY RESILIENT RECOVERY PROJECT (BERRY)

Terms of Reference

Design Consultancy and Technical Assistance for the Construction of Reverse Osmosis Desalination Plants in Union Island and Mayreau, Saint Vincent and the Grenadines

Ministry of Finance, Economic Planning and Information Technology

Economic Planning Division

Kingstown

Saint Vincent and the Grenadines

June 2026

1.0 INTRODUCTION

1.1 Background

The Government of St. Vincent and the Grenadines (GoSVG) is the beneficiary of the World Bank financing under the Hurricane Beryl Emergency Resilient Recovery Project (BERRY), which includes investments in resilient water supply systems in the Grenadines. Within this framework, a Grenadines Water Supply Subproject has been defined to address chronic potable water shortages on Union Island and Mayreau, two islands located in the Grenadines severely impacted by Hurricane Beryl in July 2024 and long affected by structural water scarcity.

Union Island and Mayreau face persistent freshwater shortages due to limited natural sources and seasonal variability. The Grenadines have no perennial rivers or springs, and potable water supply is almost entirely dependent on private roof catchments, small public catchments, and limited water storage. The damage to roofs, tanks, and public infrastructure caused by Hurricane Beryl further reduced water availability, increasing vulnerability during dry months and in future climate-related shocks.

To achieve long-term resilience and to eliminate the need for costly emergency water barging from St. Vincent, the GOSVG, through its Project Management Unit (PMU-BERRY) in the Ministry of Economic Planning, will implement the design and construction of seawater reverse osmosis (SWRO) desalination plants on Union Island and Mayreau, along with ancillary distribution tanks, piping distribution networks and solar energy systems to power plant operations. The Central Water and Sewerage Authority (CWSA) is the Implementing Agency responsible for guiding, reviewing, and supervising the Consultant's work under this Contract. Preliminary engineering and conceptual designs for both islands have been prepared by CWSA based on available hydrological records, population forecasts, water demand modeling, field surveys and existing regional ESIA. These documents including design concepts, projected demand, proposed RO capacities, potential sites, and distribution layouts will be made available to the Bidders, per request. These preliminary studies are to be used only as guidance for detailed engineering design; their use is at the Consultant's own risk, and no liability shall be assigned to GoSVG or CWSA for their accuracy or assumptions.

1.2 Justification / Purpose

1.2.1 Union Island

Union Island experiences annual water shortages due to many reasons including: low annual rainfall (~38 inches), absence of rivers or groundwater sources, heavy reliance on household roof catchments and two small public catchments, inadequate storage capacity at household and community levels, growing tourism and commercial demand and an overall worsened capacity due to the passage of Hurricane Beryl which caused damage to roofs and tanks, severely reducing effective rainwater collection capacity.

During regular conditions rainwater harvested across all private and public catchments fall short of the projected annual demand. This deficit forces residents and businesses to purchase water barged from St. Vincent at a high cost; an approach that is neither financially nor logistically sustainable.

1.2.2 Mayreau

Mayreau has no perennial streams, springs, or groundwater. There is a total reliance on residential and public roof catchments, limited public storage (~110,000 gallons) spread across Old Wall and Station Hill, insufficient household storage to carry families through the dry season. There are persistent water shortages every dry season with high dependency on costly water barging.

Even with optimized catchment performance, water availability does not meet the projected average daily demand. The preliminary engineering assessment concluded that a 13,200 gpd SWRO plant located at Saline Bay, integrated with existing storage tanks, is the most resilient and cost-effective solution.

Purpose of the Consultant Assignment

CWSA has performed a comprehensive analysis in the past which identified SWRO desalination as the only viable long-term source to close the water deficit in these islands. SWRO plants on both islands along with ancillary storage, distribution networks, and PV power supply are recommended to supply the surrounding communities with drinking water.

The objective of this Consultancy is to prepare a concept design for the production facility (SWRO) and storage of the two water systems, and will provide a full Environmental and Social Impact Assessment, detailed engineering design, preparation of the technical specifications for the Supply and Installation of the two SWRO desalination systems, PV plants, and associated distribution infrastructure, and provide environmental and social risk management plans and frameworks according to the World Bank's Environmental and Social Framework (ESF). Additionally, the Consultant will provide support during the procurement process, and technical assistance during the installation of the facilities on Union Island and Mayreau.

2.0 OBJECTIVES

2.1 BERRY Water Component Design Objectives

Assessment

The Environmental and Social Risk Management Stage for the Grenadines Water Supply Subproject comprise of the following main components:

Environmental and Social Risk Management - Preparation of site-specific Environmental and Social Impact Assessments (ESIAs), Environmental and Social Management Plans (ESMPs), and Resettlement Action Plan (RAP), consistent with the applicable provisions in the Volcanic Eruption Emergency Project's (VEEP) - Environmental and Social Framework (ESMF) and Resettlement Policy Framework (RPF), as relevant, for all proposed facilities considering the technical specifications of the hydraulic designs and in particular the intake, and outfall and brine discharge systems and in accordance with the BERRY's Environmental and Social Commitment Plan (ESCP), Stakeholder Engagement Plan (SEP), the World Bank (WB) Environmental and Social Framework (ESF) as well as the WB Environmental, Health and Safety Guidelines for Water and Sanitation.

The concept design for the two SWROs on Union Island and Mayreau.

- SWRO Plants – Design resilient and environmentally compliant Seawater Reverse Osmosis (SWRO) treatment plants that meets forecasted daily water demands of the islands with great focus on energy and operational efficiency, redundancies and resilience. The SWRO plants shall have a minimum capacity of 315 m³ /day capacity on Union Island and 40 m³ /day on Mayreau for 8 hours service daily.
- Location - Considering that desalination plant sites are located near coral reefs, seagrass beds, and nesting sites for green, leatherback, and hawksbill turtles, any construction should be **off the beach**. In the case of Mayreau, all proposed project components, including the desalination plant and water infrastructure, are located within the Tobago Cays-Mayreau Marine Park/Wildlife Reserve, a key area for marine biodiversity, harboring the most extensive coral reefs in SVG and seagrass beds that provide habitat for threatened sea turtles, namely Green Turtles, Hawksbill Turtles, and Leatherback Turtles. Also, please consider that the SWRO plants should only operate during the day, due to interference with marine life during the night. So, the capacity of the two SWRO plants should be designed to fill the storage tanks in 8 hours per day. The storage tanks' capacity should be defined taking into consideration this factor, not the standard 1/3 average demand.

Design and Review

This stage comprises the following main components:

- Review of the existing Hydraulic Design – Review and refinement of the existing hydraulic designs provided by the CWSA for Union Island and Mayreau; inclusive of water demand, distribution pipelines, storage, pumping, power demand and power supply by PV.
- SWRO Plants – Design resilient and environmentally friendly treatment plants that meets forecasted daily water demands of the islands with great focus on energy and operational efficiency, redundancies and resilience. The SWRO plants shall have a minimum capacity of 315 m³ /day capacity on Union Island and 40 m³ /day on Mayreau for 8 hours service daily.
- Intake – Design a reliable, low maintenance and low-impact seawater intake system to meet the demands of the SWRO plant which minimizes environmental impact.
- Outfall and Brine Discharge – Design a resilient, low maintenance brine treatment and outfall that effectively disposes of brine produced by the SWRO plant with minimal negative impact to the coastal environment.
- Conduct, as needed, geotechnical investigations for RO plant buildings, tank foundations, and intake/outfall structures. Prepare geotechnical report including foundation recommendations, soil bearing capacity, excavation requirements, and corrosion potential. Prepare a project schedule outlining inception, fieldwork, design phases, permitting, procurement support, and deliverables.
- Preparation of tender documents for procurement of works, services, material and equipment in accordance with the World Bank Regulations.
- Provide technical support during the procurement process, for example response to requests for clarifications to the issued bidding document, be present during the pre-bid meeting, evaluation of all bids, and other technical inputs as needed.
- Supervision of construction of the Works Contract.

3.0 SCOPE OF SERVICES

3.1 Task 1: Environmental and Social Risk Management

- The Consultant shall prepare site-specific ESIA's as outlined in Annex I, including ESMPs, and RAPs if required, for all proposed SWRO facilities, intakes, outfalls, and associated infrastructure on Union Island and Mayreau and as a function of their technical design. Guidance from initial screenings conducted by BERRY

project staff shall be used in drafting documents. Screening report will be provided to the successful firm

- Environmental and social issues to consider as part of the ESIA must include among other impacts associated generally with the construction phase of the project and specifically with water intake and brine discharge on marine habitat, in particular globally significant coral reefs and seagrass beds supporting marine biodiversity, and disturbance due to light and noise from operation of the SWRO to the nesting and feeding areas for the Critically Endangered Hawksbill Turtle and Endangered Green Sea Turtle as well as any mangrove systems.
- The ESMP must outline the mitigation, monitoring, and institutional measures to be taken to eliminate adverse environmental and social risks and impacts as identified in the ESIA, offset them, or reduce them to acceptable levels. The ESMP will also need to include the measures and actions needed to implement these measures, further guidance can be found in Annex II.
- The ESIAs, ESMPs, and RAPs must comply with the Project's Environmental and Social Commitment Plan (ESCP), Environmental and Social Management Framework (ESMF), Resettlement Policy Framework (RPF) and Stakeholder Engagement Plan (SEP), as well as all applicable World Bank Environmental and Social Standards (ESSs), namely ESS1, ESS2, ESS3, ESS4, ESS5, ESS6, and ESS10 as well as WB Environmental, Health and Safety Guidelines (EHSG) for Water and Sanitation.
- The ESIA reports outline shall be developed in advance and agreed with local authorities and WB, as needed, during the preliminary phases. All documents shall be developed in English.
- Any required changes to the ESIAs shall be made on the basis of the comments received during the study review and as the hydraulic design is finalized.
- The Final ESIA reports shall be submitted to local authorities, as needed, and for public disclosure.

3.2 Task 3: Plant Designs

- Prepare designs for all components required for the supply and installation of SWRO Treatment Plants including all associated civil, structural, mechanical, and electrical works.
- Intake - Design a reliable, sea water intake SWRO plants -Determine the optimal intake type and prepare hydraulic and structural design for intake works, including

screens as well as mitigation measures to reduce engulfing of marine life, pumps, piping, valves, and appurtenances. Include construction methods and required materials. Review the available equipment for the two compact SWRO plants in the market and select the capacity based on the market availability to provide the required capacity in 8 hours per day. The production of the two SWRO plants should be calculated based on the average demand plus a coefficient of security to be discussed with CWSA. Due to the location of the two SWRO outside of the main ports or infrastructure, redundancy should be considered in the design, and perhaps two SWRO plants, of smaller capacity, should be installed in parallel for each of the two sites.

- Recovery Rate - Another main factor in selecting the two SWRO, is the recovery rate. The consultant should aim for a SWRO plant design with 40% to 50% of recovery rate for the brine. So, the review should include the recovery rate factor as a main topic for discussion and decision.
- Outfall and Brine Discharge – Design a resilient, low maintenance brine treatment and outfall that effectively disposes of brine produced by the SWRO plant with minimal negative impact to the coastal environment. Design brine discharge system with a salinity limit of 2,000 mg/l above ambient salinity to be met at 100 meters horizontally from the discharge point. Designs must include outfall pipeline, diffuser, and anchoring. Include hydrodynamic dispersion analysis, marine habitat protection considerations and structural design considerations. Include construction methods and required materials.
- Include safe chemical storage areas and emergency power systems. Incorporate coastal resilience measures for storms, waves, and storm surge. Specify corrosion-resistant materials for SWRO plant suitable for marine environments.
- Review, calculate/design power requirement for the SWRO Desalination Plant, pumps, site lighting and other ancillary equipment from a PV supply.
- Carry out the detailed design for a remote grid tied Solar Photovoltaic (PV) power plant, to power the SWRO water desalination plants on Union Island and Mayreau.
- Provide detailed civil, structural, mechanical and electrical drawings, technical specifications, Bill of Quantities (BOQs), Operation & Maintenance Manuals, Equipment datasheets, Construction requirements and material standards for all works to be performed.

3.3 Task 3: Review of existing Hydraulic Design

- Review CWSA's forecasted water demand for both islands, Mayreau and Union Island, to ensure methodology meets international acceptable engineering standards that captures possible future expansion.
- Review and amend CWSA's preliminary hydraulic designs for both islands to ensure they meet International acceptable engineering standards or best practices utilising Bentley WaterCAD water distribution modelling software. Use modelling tool to ascertain adequacy of tanks storage capacities, pipe diameters and valving requirements inclusive of gate valves, air valves, control valves and washout valves.
- Model transmission and distribution network using existing water model designs and design parameters. Validate pipeline sizes, materials, valve locations, and hydraulic grade lines. Ensure uniform and reliable supply to existing tanks on the islands.
- Selection of most appropriate pipe material based on suitability for the local conditions, hydraulic performance and ease of handling.
- Integrate resilience measures for: flooding, storm surge, coastal exposure and slope instability. Identify and aim to avoid erosion-prone and other hazard-prone areas.
- Design intake pump system considering that a nearshore well will be used as the method of intake.
- Design transfer pump systems from RO plant to distribution tanks. Determine TDH, pump sizing, NPSH, operational duty cycles, and redundancy.
- Integrate resilience measures for: flooding, storm surge, coastal exposure and slope instability
- Develop tie-in details for existing tanks, standpipes, distribution lines, and pressure zones. Ensure compatibility with future network expansion plans.
- Review all pump systems assessing total dynamic head, pump sizing, net positive suction head, operational duty cycles, and redundancy requirements.
- Select electric motors that matches the required pump(s) considering power output of the pump, demands, required operating pressure(head).
- Prepare design of SCADA system for both Mayreau and Union Islands water production, transmission system and storage.
- Design a Photovoltaic system to meet the overall energy requirements of all pump systems by sections. Provide detail drawings and specifications

- Conduct topographic surveys of all sites to confirm existing site elevations and utility locations.
- Conduct geotechnical investigations for SWRO plant buildings, tank foundations, intake structures and outfall structures. Reports should include soil bearing capacity, foundation design recommendations, retaining wall design recommendations and excavation requirements.
- Prepare detailed designs, bills of quantities, drawings, and technical specifications for all civil and other works
- Preparation of tender documents for procurement of works, services, material and equipment, as well provide technical support (for example evaluation of all bids, contract negotiations) to CWSA and PMU during the procurement process. Duly incorporate into tender documents for procurement, the requirements (as applicable) of the Environmental and Social Standards of the Environmental and Social Framework (ESF) of the World Bank.

3.4 Task 4: Assist in the Tendering Process and Technical Support

- The Consultant shall assist CWSA and the PMU throughout the procurement cycle for all Works, Goods, and Services contracts associated with the SWRO systems.
- Prepare complete Tender Documents (technical specifications, drawings, BOQs, Employer's Requirements, ESHS specifications) fully compliant with World Bank Procurement Regulations and incorporating all relevant ESF requirements.
- Prepare detailed list of materials such as pipes, fittings, valves, pumps, generators, PV panels, meters, cables etc. with detailed technical specifications for procurement.
- Prepare detailed designs, bills of quantities, drawings, and technical specifications for all civil and other works.
- Preparation of tender documents for procurement of works, services, material and equipment, as well provide technical support (for example evaluation of bids, contract negotiations) to CWSA and PMU during the procurement process. Duly incorporate into tender documents for procurement, the requirements (as applicable) of the Environmental and Social Standards of the Environmental and Social Framework (ESF) of the World Bank.

- Assist CWSA/PMU in managing requests for clarification from bidders during the tender period and preparing responses.
- Assist CWSA in evaluating technical offers, including conformity with design requirements, review of proposed installation methodologies, assessment of contractor ESHS capacity, evaluation of compliance with ESMP/ESHS requirements, provide recommendations for contract award consistent with World Bank procurement Regulations.

3.5 Task 5: Construction Supervision

- The Consultant shall perform the role of supervision for the construction of all contracted works including civil works, pipelines, treatment facilities and borehole development. The Consultant should issue necessary instructions to the Contractor as required for the smooth execution of the Works, provided that no instruction, which may have financial consequences or may entail extension of time, will be issued without the prior approval of the CWSA, as dictated by the Conditions of Contract. The Consultant shall negotiate with the Contractors and make recommendations to the CWSA for approval on rates for any additional works and services that would be discussed with PMU-BERRY.
- Update Designs as it becomes necessary and provide all pertinent information including documentation, drawings, specification etc. to enable contractor to carry out the work as construction progresses. All changes are to be presented to CWSA with cost estimate and time implications for approval.
- Ensure that the Contractor's proposed schedule is realistic, updated, and allows for local conditions such as climatological patterns.
- Survey, measure and inspect all aspects of the work carried out by the contractor during the construction process to ensure accuracy to the provided design and adherence with the construction standards and codes. The consultant also should review the Contractor's adherence to site-specific Environmental and Social Management Plan (ESMP) and applicable requirements of the project as well as any reported grievances associated with the construction phase.
- Chair at least fortnightly progress meetings with the CWSA, Contractor and other relevant stakeholders, then prepare and distribute relevant minutes in a timely manner.
- The Consultant must review the Contractor's monthly progress reports complete with all the data required within the time periods required and in sufficient detail.

The Consultant also should review the ESMP compliance status monthly to be submitted to the World Bank. All payments will be certified by the Consultant based on receipt of applications for payment received from the Contractor and verified independently by the Consultant's records.

- The Consultant will undertake supervisory duties to ensure the proper construction of the works and produce a monthly report in a format approved by the CWSA.
- Ensure that all infrastructure and E&S mitigation measures, as identified in the ESMP, are in place and being implemented prior to commissioning of borehole(s), Photo Voltaic system, generators, pumps and all other major works, i.e. pressure testing of all pipelines, commissioning of all electromagnetic equipment and water purification facilities, fencing etc.
- Pre-Operation – The consultant shall assist CWSA in the pre-operation phase of the new SWRO plants and prepare any list of items to be adjusted or replaced by the Contractor during the Defect Liability period.
- Oversee system testing and commissioning. Certify operational readiness and provide final acceptance support at the end of the Defect Liability period

3.6 Task 6: Review of designs for reservoirs and distribution lines

- Review and update existing designs (provided by CWSA) and provide all pertinent information including documentation, drawings, specification etc. to enable contractor to carry out the work. All changes are to be presented to CWSA /PMU for approval

Preparation of tender documents for procurement of works, material and equipment, as well provide technical support (for example contract negotiations) to PMU during the procurement process. Duly incorporate the requirements (as applicable) of the Environmental and Social Standards of the Environmental and Social Framework (ESF) of the World Bank

3.7. Other Requirements

The Consultant shall undertake all services described in this TOR in close coordination with the CWSA for all technical matters. While Tasks are described comprehensively, the list is not exhaustive. It is the Consultant's responsibility to:

- Verify completeness and adequacy of all scopes of work
- Extend, modify, or refine activities based on professional judgment.
- Perform all additional work necessary to achieve the objectives of the Project.

- Ensure all tasks align with the aims of the subproject under the Hurricane Beryl Emergency Resilient Recovery Project.

4.0 STANDARDS AND CODES

These Specifications refer to the standards of the AWWA (American Water Works Association) and the others listed below, may be used. All standards and codes mentioned in this specification must be adopted in their latest published review.

The design of the main structures in reinforced concrete, according to the BS EN 1992 (Eurocode2) -1,2&3 (The Structural use of Concrete) (<http://www.bsigroup.com>) for a useful life of 30 (thirty) years and consider the Class of Environmental Aggressiveness (CAA) IV (very strong). The Class of Environmental Aggressiveness (CAA) III (strong), may be used in specific situations, if the justification presented is accepted. From these conditions, the designer must adopt the concrete strength class, the water/cement ratio and the reinforcement cover according to BS EN 1992 (EC2). The admission of the ACI 318-95 Building Code Requirements for Structural Concrete and other American standards will be permitted provided that the conditions of high environmental aggressiveness for "corrosion protection of reinforcement" for a useful life of 50 (fifty) years are obeyed.

To guarantee watertightness and delay the attack of harmful chemical elements on concrete and reinforcement, the Consultant must include in design a waterproofing system for concrete structures. All materials, components and accessories used must comply with the latest revisions to the standards mentioned below, as applicable. Other standards will be accepted if they are internationally recognized and previously approved by the CWSA. As alternatives to the BS EN 1992 and AWWA Standards, the standards of the following entities will be considered:

DIN	Deutsche Institut für Normung
AISC	American Institute of Steel Construction
AWS	American Welding Society
AISE	Association of Iron and Steel Engineers
ANSI	American National Standards Institute
AISE	Association of Iron and Steel Engineers
ASME	American Society of Mechanical Engineers
JIS	Japanese Industrial Standard

FEM	Federation Europeenne de la Maintenance
AGMA	American Gear Manufacturers Association
NEMA	National Electrical Manufacturers Association
NEC	National Electrical Code
EEI	Edison Electric Institute
ISA	The Instrumentation, System and Automation Society

In addition to the technical codes listed above, the project shall be designed and implemented in accordance with the World Bank Environmental and Social Framework (ESF) and Environmental Health and Safety Guidelines (EHSG) for Water and Sanitation.

The following documents must be considered for the development of the environmental and social requirements contained in this section:

1. Negotiated Environmental and Social Commitment Plan
2. Stakeholder Engagement Plan (SEP)
3. Environmental and Social Management Framework (ESMF) for VEPP, which has been adopted for the BERRY Project
4. Resettlement Policy Framework (RPF) for VEPP, which has been adopted for the BERRY Project

All available at: <https://www.gov.vc/index.php/beryl-emergency-recovery-loan-beryl-project> and

<https://www.gov.vc/index.php/projects/2195-volcanic-eruption-emergency-project-vepp>.

5.0 WATER MAINS

5.1 General Considerations

The pipeline system shall be divided into two categories: main pipelines (≥ 100 mm diameter) and secondary pipelines (< 100 mm diameter). The alignment of all water mains shall follow the shortest feasible route while prioritizing public road corridors. Use of private land is only permitted with prior approval of the CWSA and clearance from the World Bank, as such cases may trigger the requirement for a Resettlement Action Plan (RAP) in accordance with the RPF.

In buried sections where Class 2 or Class 3 excavated materials are present, the Consultant shall provide a sand bedding and surround to protect the pipeline. Crossings of access roads or pathways shall use buried encased construction, while river, stream, lake, or wetland

crossings should be aerial wherever possible; if buried is unavoidable, a minimum cover of 2.5 m is required.

Metallic pipelines shall include robust corrosion protection systems appropriate for a marine and saline environment. Galvanization shall not be used alone; its use is permissible only when combined with polyurethane, fusion-bonded epoxy (FBE), or equivalent coatings.

Crossings of public highways shall comply with the requirements of the Ministry of Transport and Works, and construction may only commence after obtaining all necessary approvals.

The Consultant shall perform hydraulic transient (surge) analyses to design the required surge protection system, consistent with applicable standards and manufacturer specifications.

Pump mains (pressurized pipelines) shall be sized for a maximum operating period of 10 hours per day, reflecting the use of solar energy as the primary power source and avoiding night-time pumping.

Air valves shall be installed only for the safe filling and emptying of pipelines and for the release of dissolved air. Where triple-function air valves are used for transient mitigation, the recommended pressure and service limits shall be strictly observed.

Shut-off valves shall be installed at intervals not exceeding 3 km, shall be full-bore design, and manually operated unless hydraulic requirements dictate otherwise.

Final pipe diameters and pipe material selection shall be based on design outputs and economic diameter analysis, considering:

- solar energy cost
- allowable operating hours (<10 hours/day)
- installation and material cost
- long-term maintenance requirements

The economic diameter shall reflect a 30-year project horizon with a discount rate of 8% applied for present-value calculations.

A remotely controlled flow and pressure regulation system shall be provided for all pipeline branches not connected directly to a pumping facility. This system shall integrate with the SCADA/telemetry system located at the secured operations center.

6.0 RESERVOIRS

6.1 General Considerations

The Consultant shall evaluate the condition of existing treated-water reservoirs and determine whether rehabilitation or replacement is required. All communities served under this project shall have reservoirs providing minimum storage equal to 1.5 times the average daily demand, in accordance with industry's best practice for island water systems.

Each municipal or district reservoir shall include a dedicated water truck filling point. For new reservoirs, this connection shall be a minimum 100 mm diameter. All withdrawals from truck-filling points shall be metered.

Reservoirs shall preferably be constructed of reinforced concrete. Bolted glazed steel tanks may be accepted for capacities exceeding 500 m³, provided they include vitrified coatings or fusion-bonded epoxy (FBE) internal linings.

Concrete reservoirs shall use reinforced concrete with hydro-expansive water stop profiles, waterproofing additives, and an internal PVC liner or an elastomeric polyurethane coating (100% solids, solvent-free). Prestressed concrete options are also acceptable subject to CWSA approval.

All reservoirs shall be equipped with sensors and automated level controls to improve operational efficiency and minimize wastage. Level control shall be provided using float-operated valves or hydraulically actuated control valves.

The reservoir compound shall be secured using boundary walls topped with concertina (razor) security fencing. All external pipework shall use flanged ductile iron or carbon steel with dismantling couplings for easy maintenance.

All railings, walkways, access platforms, internal ladders, and external stairs shall be constructed from 304 stainless steel or higher to resist corrosion.

Where required, reservoirs shall include subsurface drainage systems to protect the bottom slab from water accumulation or uplift pressures. The tank floor shall maintain a minimum slope of 0.5% toward the drain to facilitate cleaning.

All electrical boxes installed in flood-exposed areas shall be provided with effective drainage systems and IP-rated enclosures.

Reservoir sites shall incorporate a surface drainage system that prevents localized ponding and discharges stormwater into existing roadside drains or other approved outfalls.

Each reservoir shall be hydraulically connected to both the supply pipeline and the local distribution system at the most operationally advantageous locations.

7.0 DOCUMENTATION

All documents and correspondence will be written in English; the original documents must be accompanied by the respective translation to English if in different language. In some cases, such as, for example, in the case of catalogs and technical publications, the CWSA may decline this requirement by accepting texts in other language than English, but being entitled, however, to require the translation of any text deemed important.

The measurement units of the Metric System used in SVG must be used for all references, including technical description, specifications, drawings and any additional documents or data.

All studies, plans, designs and programs must be delivered in printed and digital media, in at least 03 printed copies, with the respective electronic signature of the technicians responsible, to be provided digital certificate by the Consultant, for insertion in the CWSA's Technical File system.

All products and reports must be prepared and presented with strict quality control (including texts, maps, memorials, etc.). The reports must strive for clarity, objectivity, consistency of information, justification of results, freedom from language and typing errors, to reflect the quality standard of the documents.

The products must be written in English and delivered in at least 03 (three) printed volumes of each product and bound, in "Laser print" or similar quality, on A4 paper, containing in the body of the text: graphics, tables, profiles and similar, maps and charts, all duly referenced in the text. They must also be delivered in digital format, in a language compatible with the Windows 7 software or more current version, and in editable graphic language, as well as PDF format, both in 01 (one) copy, in the same organizational presentation of the graphic document.

7.1 Drawings, Bills of Material and Calculation Report

Specifications and calculation report must be presented to CWSA. All formulas used must be presented in their literal form, clarifying the meaning of each letter, the unit of measure and the numerical value adopted. Reference sources must always be cited.

7.1.1 Conditions for the Preparation of Drawings

The drawings must be prepared according to the AWWA standards. All drawings must have a caption where the following information will be clearly read, among others:

- CWSA'S Name (CWSA);
- Name of the work for which it is intended;
- Specific title of the design, identifying the equipment through the code and name.

In all drawings there must be a square blank space, at least ten centimeters on the side, for the stamp of the CWSA (CWSA) or its representative.

All revisions to drawings must be clearly marked by a letter, date and subject of the revision, in a convenient space on the drawing itself.

The general drawings of the subsystems or equipment must clearly highlight their operational characteristics, such as capacities, speeds, courses, flows, etc., as well as the main dimensions, weights, assembly details, finishes, clearances and other information pertinent to them.

The main dimensions that will affect the installation, such as location of anchors, location of pipes, current sockets, etc., must be indicated.

The drawings must show in highlight and in sequence, all the connections and changes that will be carried out in the works when the equipment is assembled. The specification of the electrodes, for the execution of welds, will appear in the drawings.

Each equipment will have all its drawings duly listed in A-4 format lists (210 x 297 mm), in which the number of each drawing, the revision number, the designation of the design and the date of issue of the list will be indicated.

The drawing of the general set will be accompanied by a list that identify the partial sets that make it up.

Each partial set will be accompanied by its list, with the drawings of the details that refer to each subset identified.

7.1.2 Conditions for the Preparation of Bills of Materials

Bills of materials will be drawn up for groups of drawings within a subset or assembly. Bills of materials must contain:

- Discrimination of applied material;
- Quantities per piece and per set;
- Standard brand and code of the material;
- Reference, manufacturer, catalogue, brochure, etc.

The quantities indicated in the bills of materials will be net, with no additions for losses. The consultant will be responsible for supplying the materials in the quantities necessary

for the installation and operation of the object of supply, considering losses, replacements, etc.

8.0 DESIGN TEAM COMPOSITION AND QUALIFICATIONS

The design team should be multidisciplinary and possess at least 8 years qualifications and experience relevant to water supply or treatment infrastructure. The must have successful completed 2 similar desalination or water treatment projects of comparable size and complexity and have experience in construction supervision. The Consultants must have experience working in small island or coastal environments and familiar with relevant standards and guidelines, including: World Bank environmental and social safeguards, Drinking water quality standards and international desalination and engineering standards

8.1 Key Experts Composition and input durations

The design team shall be comprised of the following key experts, to be deployed at different stages of the assignment and shall work directly under the Team Leader.

Area of Expertise	Level of Effort (estimated)
Team Leader/ Water Distribution System Design Engineer	6 months
Hydrogeologist	60 days
Electrical Engineer/Electromechanical Expert	30 days
SWRO - Water Treatment Expert	120 days
Environmental Specialist	60 days
Procurement Specialist	30 days
Social Specialist	60 days
Team Leader/Civil/Construction Engineer	10 months

It is acceptable that the Construction Engineer assumes the Team Leader position after commencing the construction contract.

8.2 Team qualifications and experience.

Team Leader (TL)/ Water Distribution System Design Engineer	This expert shall be the Team Leader of the assignment and shall have the overall responsibility for the executing the assignment including coordinating the assignment deliverables and comments and for the delivery of the final assignment. The TL is expected to have the following qualifications and experience. <i>Qualifications and skills</i> • At least a Master's degree in Water Supply Engineering, Civil Engineering (with Water Specialization) or any other relevant water related field. • Registered professional engineer with a recognized engineering body in the country of origin • Demonstrated excellent command of spoken and written English <i>General professional experience</i> • Minimum of 12 years' experience working in senior level in water supply sector projects. • Minimum of 10 years' experience in planning, design, implementation or construction of similar water supply systems. <i>Specific professional experience</i> • Minimum of 5 years' experience with design or construction of water supply systems which pump directly to elevated storage. • Minimum of 3 years' experience in use of water transmission or distribution modelling software such as EPANET, WaterCAD, Water GEMS, AutoCAD etc. • Must have executed at least 1 similar assignment in the last 10 years. • At least one contract with energy supply by solar panels.
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Hydrogeologist	The Hydrogeologist shall be responsible for the executing of all aspects of the development tasks and water resource assessment of the assignment. The Hydrogeologist is expected to have the following qualifications and experience. <i>Qualifications and skills</i> • At least a Bachelor's degree in Geology, Hydrogeology or Hydrology, or Engineering. • Registered professional engineer with a recognized engineering body in the country of origin. • Demonstrated excellent command of spoken and written English. <i>General professional experience</i> • Minimum of 5 years' experience in designing and development of water production wells. <i>Specific professional experience</i> • Minimum of 5 years' experience with the development of ground water for water distribution. • Experience in use of ground water modelling software or related analytical programs.
Electromechanical Expert (EME)	The Electromechanical Expert shall be responsible for the executing of all the electromechanical tasks of the assignment. The EME is expected to have the following qualifications and experience. <i>Qualifications and skills</i> • At least a Bachelor's degree in Electrical or Electromechanical Engineering. • Registered professional engineer with a recognized engineering body. • Demonstrated excellent command of spoken and written English <i>General professional experience</i>

	• Minimum of 10 years' experience in designing and installation of electromechanical equipment for the abstraction of ground water. <i>Specific professional experience</i> • Minimum of 5 years' experience with design of electromechanical components of water supply systems. • Minimum of 3 years' experience in use of electrical modelling software and AutoCAD etc. • Must have executed at least 1 similar assignment in the last 5 years. Similar assignment on size of pumps, PV, and electrical load.
SWRO - Water Treatment Engineer	The SWRO - Water Treatment Engineer shall be responsibility for the executing of all the water treatment tasks of the assignment. The WTE is expected to have the following qualifications and experience. <i>Qualifications and skills</i> • At least a Master's degree in Water Treatment or Environmental Engineering. • Registered professional engineer with a recognized engineering body in the country of origin. • Demonstrated excellent command of spoken and written English <i>General professional experience</i> • Minimum of 10 years' experience in designing of water treatment facilities for the purification of surface water. <i>Specific professional experience</i> • Must have executed at least 1 similar SWRO Plants assignments in the last 5 years. Similar assignment on size and technology of the treatment plants. • Minimum of 5 years' experience in use of water treatment modelling software and AutoCAD etc.

Civil/Structural/ Construction Engineer	The Structural Engineer shall be responsible for the design of all structures including water intake structure and treatment facilities. The SE is expected to have the following qualifications and experience. <i>Qualifications and skills</i> • At least a Master’s degree in Structural or Civil Engineering. • Registered professional engineer with a recognized engineering body in the country of origin. • Demonstrated excellent command of spoken and written English <i>General professional experience</i> • Minimum of 10 years' experience in design of water supply systems. <i>Specific professional experience</i> • Minimum of 5 years’ experience with the design of water retaining structures and pipeline installation. • Minimum of 5 years’ experience in Project Management. • Must have executed at least 1 similar assignment in the last 10 years.
Procurement Specialist (PS)	The Procurement Specialist shall be responsible for the executing of all procurement of works, goods, and services for the implementation of all the works as per the detailed bills of quantities and specification. The PS is expected to have the following qualifications and experience. <i>Qualifications and skills</i> • At least a Bachelor’s degree in Civil Engineering, Project Management or Procurement. • Registered professional with a recognized professional body.

	• Demonstrated excellent command of spoken and written English <i>General professional experience</i> • Minimum of 10 years' experience in general procurement for construction projects. <i>Specific professional experience</i> • Minimum of 5 years' experience in procuring works and goods for water supply systems. • Minimum of 3 years' experience with the WB procurement guidelines on projects. • Must have participate in at least 2 similar procurement assignments in the last 5 years.
Environmental Specialist	The Environmental Specialist shall be responsible for the executing of the Environmental tasks of the assignment. The Environmental Specialist is expected to have the following qualifications and experience. <i>Qualifications and skills</i> • At least a Bachelor's degree in Environmental Management, Engineering, Earth Science or Geography, or related relevant field of study • Demonstrated excellent command of spoken and written English <i>General professional experience</i> • Minimum of 10 years' experience in environmental protection and environmental management. • Experience working in the Caribbean including on biodiversity issues. <i>Specific professional experience</i> • Must have executed at least 2 similar assignments in the last 10 years financed by Multilateral Financiers

Social Specialist	The Social Specialist shall be responsible for all the social risk management aspects of the assignment. The Specialist is expected to have the following qualifications and experience. <i>Qualifications and skills</i> • At least a Bachelor's degree in Social Sciences, Development studies or related fields. • Demonstrated excellent command of spoken and written English <i>General professional experience</i> • Minimum of 5 years' experience in project development, community engagement in water supply or sanitary sewage works. • Experience working in the Caribbean. <i>Specific professional experience</i> • Minimum 2 year in the role of coordinating social and/or multidisciplinary field teams, Community engagement, involving the preparation of stakeholder engagement plans, diagnoses and technical social reports, also encompassing planning and execution of socio-educational, socio-environmental and gender actions. • Experience in at least 01 (one) contract for the execution of works in Projects financed by the World Bank or BID, using their social safeguard policies.
<i>Note on education levels:</i> • <i>BSc means an academic degree of at least 3 years</i> • <i>MSc means an academic degree after BSc of at least 5 years in total.</i> • <i>Meeting the requirement receives a satisfactory rating</i> • <i>Not meeting the requirement receives an unsatisfactory rating</i> <i>Academic achievement beyond the requirement receives a very good rating</i>	

The estimated total number of professional staff-months required for the assignment, excluding suggested support staff, is 6 **staff-months**.

8.3 Suggested Support Personnel

The support personnel - administrative and technical - necessary for the full execution of the services, as well as for the approval and specific Technical Responsibilities, if any, will be the exclusive responsibility of the Consultant. However, the following professionals are suggested as members of the support personnel:

- a) Environmental Technician;
- b) Surveyor;
- c) Surveyor Assistant;
- d) CAD Designer;
- e) Administrative Technician or Assistant;
- f) PV systems Specialist
- g) Electrical Systems Specialist;
- h) Specialist in Archeology and Historical and Natural Heritage;

The Consultant must keep the team of engineers, specialists, and technicians complete and available, regardless of medical leave of any kind (illness, accident, work accident, etc.), vacation, absences, etc., to avoid interruption or delay of activities of the CONTRACTOR and ENGINEER, and in order to fully comply with the terms of the Construction Contract, including: deadlines, costs, work plans, plans that are part of the PGS and the established schedule.

The Consultant team must be present to supervise and accompany, in all places where there is a construction work or service in execution by the CONTRACTOR, at any time, on any working day, Saturday, Sunday or holiday. The costs related to the total availability of the team must be included in the hourly costs of the professionals who are part of the proposed ENGINEER Technical Team for the development of the contracted supervision of work.

9.0 REPORTING AND PROGRAMME

9.1 Deliverables and Payments schedule

The table below provides a summary of the minimum required reports (deliverables)

Report	No. of Copies	Date of Submission	Payment %
Task– Lumpsum Contract			
1. Inception Report	1 soft copy	two (2) weeks after contract signature	5
2. Draft separate ESIA and ESMPs reports (one for each site) for client approval.	1 soft copy	four (4) weeks after contract signature	10
3. Proposed designs for the two SWROs, including capacity, operation standard, technology, intake, brine treatment, and discharge, align design with ESIA constraints (avoid sensitive habitats, minimize social displacement) and/or update ESIA and ESMP as necessary	1 hard copy & 1 soft copy	four (4) weeks after submission of the draft ESIA and ESMP report	15
4. Discussion of Investigative reports. It is necessary to make sure that cost	soft copy sent to the participants 1 week prior to the online Meeting	one (1) week after submission of the draft design.	

comparison for different intake and outfall structures should be presented and proposed designs for the two SWROs, including capacity, technology, intake, brine treatment, and discharge, with the financier with focus on technical and the Environment Considerations			
5. Final separate ESIA's and ESMPs reports (one for each site)	1 hard copy & 1 soft copy	two (2) weeks after approval of draft report, but no later than ten (10) weeks after contract signature	10
6. Detailed final design report (incorporating comments from CWSA), including bills of quantities, drawings, cost estimate & tender documents and list of SWROs, Pipes, fittings, valves, submersible pumps, PV system components, generator etc. and		four (4) weeks after approval of draft report, but no later than fourteen (14) weeks contract signature	25

other related items for procurement			
7. Second draft of ESIA and ESMP report which shall include the reservoir and distribution lines (Each island must be in separate sections)		fourteen (14) weeks after contract signature	10
8. Design Review of reservoir, pumping, and distribution lines		sixteen (16) weeks after contract signature	
9. Final version of ESIA's and ESMPs and detailed design review report for the reservoirs and distribution lines, including bill of quantities, specifications, engineering estimate & tender documents after incorporating final comments from CWSA	1 hard copies & 1 soft copy	twenty (20) weeks after contract signature	15
10. Monthly Progress Reports	1 soft copy	monthly during implementation phase	

11. Final Report	1 printed and 1 soft copy, in an editable format	within thirty (30) calendar days after the date of the issuance of the final Acceptance Certificate	10
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The CWSA shall provide comments on each deliverable within ten (10) working days.

9.2 Minimum Content of key Reports:

a) Initial Report

The Inception Report must be submitted within two weeks of authorization to start the consulting services. It will include proposals, guidelines and milestones on how to achieve the objectives set out in the Contract, as well as the Execution Schedule. It is necessary to make sure that the events are carried out so that the Engineering Design and works can be executed within the expected time and cost.

b) Intake and Outfall, Tanks and Distribution Mains Report and Assessment of existing situation review

The Investigative reports and proposed designs for installation of a SWRO Plant and Distribution Network in Mayreau and Union Island, including appropriate screening, rising main (s) and necessary fittings such as valves must be submitted within six weeks of authorization by CWSA to start the consulting services. This investigation and design must discuss the intake and outfall systems to make the system more resilient. Also, it is necessary to make sure that cost comparison for different intake and outfall structures should be presented; the proposed capacity or size of each based on the outcome of the hydraulic simulations, and prepare detailed bills of quantities; drawings; and technical specifications for full procurement and installation. The Assessment of existing situation of the overall system should also be presented with main recommendations.

c) Draft and Final Detailed Design Reports

The Consultant must prepare the Engineering Design Report according to the terms of this TOR, as well as norms and standards listed in the TOR, if there are needs to meet CWSA's specific requirements during the elaboration and implementation stage. The Consultant should recommend or not its approval.

d) Environmental and Social Reports

The Consultant must prepare the site-specific ESIA's and ESMPs considering the technical specifications of the hydraulic designs and in particular the intake, and outfall and brine discharge systems, with information sufficient to address the World Bank (WB)

Environmental and Social Framework (ESF) as well as the WB Environmental, Health and Safety Guidelines for Water and Sanitation, and the CWSA's Requirements. Ongoing implementation of the ESMPs must be reviewed together with the Monthly Reports.

e) Monthly Progress Reports

The Consultant must produce monthly progress reports, throughout the contract period, based on the reports issued by the CONTRACTOR, and on the services performed by the Consultant, with clear information on the development of the Construction Contract, including the performance of environmental and social compliance activities, and submit them by the seventh day of the following month. The report will consist of the following chapters, among others:

- Status of the services for: elaboration of the Engineering Design, construction of the works, CONTRACTOR's equipment and mobilization of the personnel, during the construction progress until the issue of the Taking-Over Certificate;
- Status of implementation of mitigation measures for environmental and social issues and monitoring, according to the site specific ESMP and the instructions contained in the Requirements of the Construction Contract;
- Status of elaboration and implementation of the RAPs, according to the instructions contained in the Requirements of the Construction Contract;
- Analysis of requests for interim payments submitted by the CONTRACTOR, for the purpose of issuing Interim Payment Certificates;
- Description of the delays, the works execution's problems and the mitigating measures, and suggested steps to overcome them;
- Services and activities performed by the key and support personnel who are part of the Consultant team during the term of the overall contract;
- List of significant elements regarding actions on issues that require decision or authorization by CWSA, the CONTRACTOR, the Consultant or federal, state or municipal authorities.

f) Final report

The Final Report should reflect the general state of the complete Construction Contract, allowing the Consultant to issue the Performance Certificate, at the end of the defect's liability period.

In this report the Consultant must present a history of the recommendation matrix since the Initial Report, the activities carried out by the operator for the preservation of the works,

and if there are defects detected, the Consultant must inform the actions taken to correct them.

The Consultant will submit the Final Report on the construction of the work in three printed and three digital copies, in an editable format (.pdf or similar format will not be accepted), within 30 (thirty) calendar days after the date of the issuance of the last Taking-Over Certificate; with a detailed summary of each volume, with the costs of construction and supervision, personnel and equipment used, compliance with deadlines, problems faced and solutions adopted, approval of completed works and “As Built”, and any other relevant aspect that occurred during the execution of works; recommendations for operation and maintenance, suggestions for the execution of works in the future.

Special attention should be placed on the initial operation of the SWROs and pipeline system; technical parameters and indicators of operation, and others related to the conclusion of the contract; compliance with deadlines; problems faced and adopted solutions, receipt of the completed work; and any other relevant aspect or situation that occurred during construction; as well as recommendations for operation and maintenance.

General Instruction- These reports shall include a table for quality assurance and version tracking with details on what, when, how and by whom the document was prepared (name and position of persons who prepared, revised and approved the Report including areas of responsibility, areas reviewed, number of revisions, start and completed dates and comments, and so on). A chapter on compliance with the ESCP and E&S management plans, specifically the ESMP should be included in each report.

10.0 MINIMUM EQUIPMENT AND MATERIALS REQUIRED

During the Construction phase, it will be made available in the Main Office installed by the CONTRACTOR, space for the Consultant and CWSA teams, with a minimum area of 50.00 m², furnished with tables for office and meeting, chairs and large cabinets; including a bathroom and power supply. However, before the CONTRACTOR is mobilized for the Construction Phase, the Consultant must arrange temporary office, preferentially close to the Main Office of CWSA.

The Consultant must provide all the equipment and materials necessary for the development of the contracted activities, including field and technical room services, which must contain the minimum structure listed in table 1. Attention should be paid to the transportation needs to and between the two islands that should be included in the consultant’s proposal.

Description	Unit	Amount
Computer	Unit	4

Multifunctional Printer	Unit	1
Surveying Equipment	Equipment	1

Table 1: Minimally necessary equipment

12.0 SCOPE OF SERVICES – SUPERVISION FOR THE CONSTRUCTION OF THE RO DESALINATION PLANTS IN MAYREAU AND UNION ISLAND AND RESERVIORS AND DISTRIBUTION LINES

The Consultant shall provide professional supervision services for the construction of a plant in Mayreau and Union Island and reservoirs and distribution lines to ensure that all works are executed in accordance with the approved designs, technical specifications, contract conditions, environmental and social safeguards, and applicable engineering standards.

The Consultant's responsibilities shall include, but not be limited to, the following:

1. Construction Supervision and Contract Administration

- Supervise and monitor all construction activities related to the desalination plants, reservoirs, pipelines, fittings, valves, and associated infrastructure.
- Ensure that works are carried out in compliance with approved drawings, specifications, work plans, and construction schedules.
- Review and certify contractor submissions, including work programs, method statements, material approvals, and payment applications.

2. Quality Assurance and Quality Control

- Monitor the quality of materials, workmanship, and construction methods used on site.
- Ensure that all testing and commissioning activities are conducted in accordance with approved standards and procedures.
- Verify that appropriate quality control measures are implemented by the Contractor.
- Identify defects and ensure corrective actions are undertaken in a timely manner.

3. Monitoring of Progress

- Track the progress of works against approved schedules and milestones.
- Identify potential delays and recommend corrective measures to ensure timely completion of the project.
- Prepare regular progress reports detailing physical and financial progress, issues encountered, and recommendations.

4. Environmental, Social, Health and Safety Compliance

- Monitor compliance with environmental and social safeguard requirements, including mitigation measures outlined in the project instruments.
- Ensure that occupational health and safety standards are adhered to on all construction sites.
- Report and document incidents, accidents, grievances, and non-compliance issues, and ensure appropriate corrective measures are implemented.

5. Stakeholder Coordination

- Liaise with the Employer, Contractor, utility providers, local authorities, and affected communities as necessary to facilitate implementation of the works.
- Participate in site meetings and technical discussions and provide professional recommendations on construction-related matters.

6. Measurement, Certification and Reporting

- Verify quantities executed and certify interim and final payment certificates.
- Maintain accurate records of site activities, instructions, variations, and tests conducted.
- Prepare and submit inception, monthly, and final supervision reports.

7. Testing, Commissioning and Handover

- Witness testing and commissioning of reservoirs, pipelines, and associated systems.
- Ensure that defects identified during testing are rectified prior to issuance of completion certificates.
- Verify submission of as-built drawings, operation manuals, warranties, and other handover documentation.
- Support the Employer during provisional acceptance and final handover of the works.

8. Defects Liability Period

- Oversight during the defects liability period and ensure that all defects identified are corrected by the Contractor prior to final acceptance of the works.

The Consultant shall be paid on a time-based basis in accordance with the agreed rates and the level of effort approved under the Contract. Payments shall be made against actual time spent by the Consultant's personnel in carrying out the services, supported by an invoice detailing the services provided during the reporting period, timesheets and progress reports.

The Consultant's remuneration shall include:

- Remuneration for professional and support staff based on agreed daily or monthly rates;
- Reimbursable expenses, where applicable and approved by the Employer, including travel, accommodation, communication, printing, and other project-related costs;
- All overhead costs associated with the execution of the Services, unless otherwise stated in the Contract.
- The Employer reserves the right to withhold payment for services not satisfactorily performed or for unsupported claims and expenditures.
- Any variation in the level of effort, personnel, or scope of services shall require prior written approval from the Employer in accordance with the provisions of the Contract.

13.0 APPENDICES

13.1 Annex 1 – ESIA Guidance Note

Succeeding the E&S screening provided by the client (GovSVG), the Consultant will prepare an Environmental and Social Impact Assessment (ESIA) report which will follow the general guidance provided in Annex 1 of the World Bank Environmental and Social Framework Environmental and Social Standard 1 on Environment and Social Assessment, and include the following items, as determined from the screening phase

- ***Non-technical Executive Summary:*** concisely discusses significant findings and recommended actions in lay language.
- ***Sponsor presentation:*** concisely describes sponsor's policy and activities and discusses how the proposed project fits into them.
- ***Description of policy, legal and administrative framework:*** discusses the policy, legal, and administrative framework within which the ESIA is carried out, including host country regulations, including obligations implementing relevant international social and environmental treaties, agreements and conventions, World Bank Environmental and Social Standards, national and regional instruments, applicable water resource codes, land and nature protection codes. It identifies the applicable and relevant national environmental standards; in the absence of national legislation with respect to brine discharge, confirm applicability of the standard used in California as the most relevant example of good international industry practices (GIIP):

- Under national and local requirements, there are no prohibitions or recommended measures for managing wastewater effluent such as brine. In the absence of specific limits, especially for salinity, the approach adopted in California should be followed, which is not site specific and considers:
 - Salinity limit of 2,000 mg/l above ambient salinity to be met at 100 meters horizontally from the discharge point; other values can be accepted if equivalent protection can be demonstrated through use of the WET test (Whole Effluent Test); and
 - Modelling to demonstrate no negative effect of the salinity plume outside the mixing zone, and to demonstrate the acceptability of the discharge technology in case brine discharge does not occur through multiport diffusers technology (considered as second-best option in California, where co-mixing with other water that otherwise would be discharged at sea is not possible).
- ***Project description:*** concisely describes the proposed project, presenting all its components (i.e., plant, pipeline, and ancillary facilities), and its geographic, ecological, social and temporal context, including any offsite investments that may be required (e.g. dedicated transmission lines, access roads, power plants, water storage, and raw material and product storage facilities) and facilities and activities by third parties that are essential for the successful operation of the project. It describes the construction phase elements, including construction camps, workforce, equipment on site, construction material needs and extraction sites. It includes maps showing project's site and area of influence.
- ***Environmental and social baseline description*** assesses the dimensions of the area involved in the project and describes the existing physical, biological, and socio-economic conditions before the project commences, in order to provide an understanding of the sensitivity of the currently affected environment.

Data shall be relevant to decisions about project location, design, operation, or mitigation measures. Available data on terrestrial and aquatic environment shall be collected from bibliography and satellite images and completed by field surveys. Information to be provided includes:

- *Meteorology:* meteorological data recorded by the closest meteorological stations (air temperature and humidity, rainfall, winds including seasonal and annual wind roses, stability classes statistics, visibility, site-specific parameters).
- *Flooding/Natural Hazards:* identification of main natural hazards.

- *Air Quality*: air quality data at the site, if existing, and/or air quality monitoring networks and values (including, but not limited to, particulate matter, nitrogen oxides, and sulphur oxides); individuation and description of the most probable receptors. If representative data are not available, the Consultant will conduct ambient air quality measurements at the closest receptors to characterize baseline conditions for dust/PM10, nitrogen oxides, and sulphur oxides.
- *Land Use*: identification of main land uses and development of thematic maps.
- *Geology and Soil*:
 - geologic and geomorphologic characterization (including the identification of the main land features, such as slope, landslides, slope instability and surface expression of faults);
 - soil characterization (describing types and quality);
 - geotechnical characterization (including geotechnical observations on the field);
 - geohazards (including landslides, seismic risk and site-specific hazards).
- *Water Resources*:
 - Surface Water: hydrographic, hydrologic and hydrochemical characterization of the main surface water bodies (including physical, chemical and biological characteristics of near shore waters); characterization of the hydraulic/hydrodynamic conditions situated in the area of influence including currents, waves, and tides;
 - Groundwater: hydrogeological characterization of groundwater (flow direction, which should be to the depth of the sea and permeability).
- *Biodiversity Baseline*: Characterization of the habitats and species occurring in the project area (marine and terrestrial), with additional focused studies on species of concern.
- *Landscape and Cultural Heritage*: characterization of the main morphological, historical-archaeological and cultural aspects of the territory. The Consultant shall conduct a field survey in the Project's area of influence to characterize the cultural heritage and resources. The result of this investigation will constitute a specific study report which will be presented as an Annex of the ESIA.
- *Noise and Vibration*: characterization of noise and vibration in the area of interest and identification and description of potential receptors.

- *Public Health*: characterization of public health conditions in the area of influence of the project.
- *Socio-Economic Aspects (including data segregated by gender)*: political organization, population and demographic characteristics, employment profile, economy and production activities, household income, infrastructures and services (water, sewage and waste management, electricity, roads and communications), health system and pressure factors, education, poverty indicators, civil society (NGOs), land rights and landholding, culture, religion, tradition and tourism. Identification of affected communities by the project. Identification of the potential occupants and/or users of acquired land, having with distinct social and cultural identities, and the traditional systems of land ownership and livelihoods. The Consultant shall conduct a field survey in the Project's area of influence to characterize the socio-economic aspects and identify and characterize all potentially affected communities and land occupants and users. The result of this investigation will constitute a specific study report which will be presented as an Annex of the ESIA.
- ***Prediction and assessment of environmental and social impacts***: identify, predicts and assesses the project's likely positive and negative impacts, in quantitative terms to the extent possible. Identifies mitigation measures and any residual negative impacts that cannot be mitigated. Explores opportunities for environmental enhancement. The impacts will be predicted and assessed for both the construction phase and the operations phase.

For each environmental component, potential significant¹ impacts from different project activities shall be discussed, as follows:

- *Biodiversity*: impacts related to construction and operation of facilities, with a particular emphasis on species that occur on the beachfront (including but not limited to Hawksbill, Leatherback, and green turtles and marine benthic communities and nekton at the point of water intake and wastewater (brine) discharge and The Union Island Gecko and the Pink Rhino Iguana at the locations of the storage tank and distribution lines.

¹ In order to define the significance of the impacts, the following criteria could be used:

- **Magnitude and Intensity**: defined as the potentiality to affect a wide area, a large number of receptors, or affect receptors with a significant intensity;
- **Duration** (short term/long term): evaluated considering the time span of duration of the activity causing the impact;
- **Sensitivity of Receptors**: characteristic that describes the level of resilience of the environment to the considered impacts;
- **Reversibility of the Impacts**: defined as the potentiality to cause temporary or permanent changes to any aspect of the environment;
- **Comparison with legal requirements, policies and standards**.

- *Water Resources*: impacts related to water intake;
- *Wastewater Discharge*: emissions scenarios for all streams (process wastewater, brine, etc);
- *Hydrodynamic Modelling*: impacts on the receiving environment and to inform selection process of discharge technology that allows compliance with the water quality criteria and no negative effect of the salinity plume outside the mixing zone;
- *Cumulative Impacts*: impacts of brine discharge on benthic communities related to the presence of an existing desalination plant;
- *Erosion of Beachfront*: impacts related to construction and land occupation, entailing temporary disturbance due to excavations, rainwater runoff, and wind;
- *Soil and Groundwater*: potential impacts on soil and groundwater resources from on-site discharge of process wastewater under various treatment options and storage of large quantities of hazardous material;
- *Waste*: impacts on soil and groundwater resources related to waste generation during the construction and operation phases;
- *Noise and Vibration*: emissions scenarios, modelling and compliance with noise criteria at daytime and night-time at project boundaries and identified human and environmental receptors;
- *Landscape Heritage*: visual impact assessment from the construction of the plant, pipeline, and related facilities;
- *Air*: emission scenarios, modelling and compliance with air quality criteria at project boundaries and identified human and environmental receptors; quantitative estimate of greenhouse gas (CO₂) emissions;
- *Climate change*: identify climate-related impacts that may affect project operations or that might be exacerbated by the existence of the project;
- *Occupational Health and Safety*: impacts on workers related to construction and operation;
- *Community Health and Safety*: potential impacts on surrounding communities;
- *Socio-Economic Aspects*: impacts on potentially affected communities. Key social impacts of the construction and operation of facilities to be considered and assessed will include the influx of permanent and temporary project labour and public safety during construction and transport equipment. Potential physical and economic displacement of occupants and/or users of land acquired for

development of the plant, pipelines, and other related facilities will be analysed and discussed.

- ***Analysis of Alternatives:*** compares feasible alternatives to the proposed project site, technology, design and operation (including the “without project” situation) in terms of their potential environmental and social impacts, the feasibility of their mitigation measures, their capital and recurrent costs, their suitability under local conditions and their institutional and monitoring requirements. States the basis for selecting the particular project design proposed and justifies the recommended emission levels and approaches to pollution prevention and abatement and environmental risk minimization.
- ***Environmental and Social Management Plan:*** consists of the set of mitigation and management measures to be taken during implementation of the project to avoid, reduce, mitigate, or compensate for adverse social and environmental impacts, in the order of priority, and their timelines. It includes a framework for an environmental monitoring program. Describes the desired outcomes as measurable events to the extent possible, such as performance indicators, targets or acceptance criteria that can be tracked over defined time periods, and indicates the resources, including budget, and responsibilities required for implementation. Measures and actions necessary for the project to comply with applicable laws and regulations and to meet the Environmental and Social Standards of the Environmental and Social Framework (ESF) of the World Bank will be identified, and the management program will include an Action Plan, which is subject to disclosure to the affected communities and ongoing reporting and updating. Key aspects to consider in the development of the mitigation and management measures will include, as applicable based on the baseline and assessment findings:
 - Biodiversity;
 - Wastewater (for both brine discharge and other process water);
 - Waste including hazardous and non-hazardous material;
 - Pollution prevention and spill response;
 - Noise;
 - Air emissions;
 - Emergency response;
 - Security;
 - Occupational health and safety during both construction and operation;

- Community health and safety; and
- Equipment and material transport to ensure public safety.

The ESMP shall be organized to allow compliance audits of the recommendations of the ESIA.

- ***Stakeholder Engagement***: describes the actions taken to identify and engage with the local communities affected by the Project during the ESIA process and going forward. It describes the disclosure program, the consultation program, and the grievance mechanism put in place by the Sponsor during the ESIA process.
- ***Appendixes***: should include the following items:
 - List of ESIA report preparers (individuals and organizations);
 - References: list of law references and bibliographic materials used in the study preparation;
 - Record of consultation meetings, including consultations for obtaining the informed views of the affected people, local NGOs and regulatory agencies. The record specifies any means other than consultations (e.g. surveys) that were used to obtain the views of local stakeholders;
 - Project outlines and documents, used and/or produced cartographies;
 - Tables presenting important data referred to or summarized in the main text;
 - List of associated reports (e.g. biodiversity management plan, wastewater (both brine and process water) management plan, waste management plan, emergency plan, etc), if any;
 - Action Plan that (i) describes the actions necessary to implement the various sets of mitigation measures or corrective actions to be undertaken, (ii) prioritizes these actions, (iii) includes the time-line for their implementation, and (iv) describes the schedule for communicating with affected communities when on-going disclosure or consultation is expected

13.2 Annex II – ESMP Guidance Note

Indicative outline of ESMP

An ESMP consists of the set of mitigation, monitoring, and institutional measures to be taken during implementation and operation of a project to eliminate adverse environmental

and social risks and impacts, offset them, or reduce them to acceptable levels. The ESMP also includes the measures and actions needed to implement these measures. The consultant will (a) identify the set of responses to potentially adverse impacts; (b) determine requirements for ensuring that those responses are made effectively and in a timely manner; and (c) describe the means for meeting those requirements.

Depending on the project, an ESMP may be prepared as a stand-alone document or the content may be incorporated directly into the ESCP. The content of the ESMP will include the following:

(a) Mitigation

The ESMP identifies measures and actions in accordance with the mitigation hierarchy that reduce potentially adverse environmental and social impacts to acceptable levels. The plan will include compensatory measures, if applicable. Specifically, the ESMP: (i) identifies and summarizes all anticipated adverse environmental and social impacts (including those involving indigenous people or involuntary resettlement);

(ii) describes—with technical details—each mitigation measure, including the type of impact to which it relates and the conditions under which it is required (e.g., continuously or in the event of contingencies), together with designs, equipment descriptions, and operating procedures, as appropriate.

(iii) estimates any potential environmental and social impacts of these measures;

(iv) takes into account, and is consistent with, other mitigation plans required for the project (e. g., for involuntary resettlement, indigenous peoples, or cultural heritage).

(b) Monitoring

The ESMP identifies monitoring objectives and specifies the type of monitoring, with linkages to the impacts assessed in the environmental and social assessment and the mitigation measures described in the ESMP. Specifically, the monitoring section of this ESMP will provide:

(a) a specific description, and technical details, of monitoring measures, including the parameters to be measured, methods to be used, sampling locations, frequency of measurements, detection limits (where appropriate), and definition of thresholds that will signal the need for corrective actions; and

(b) monitoring and reporting procedures to (i) ensure early detection of conditions that necessitate particular mitigation measures, and (ii) furnish information on the progress and results of mitigation.

(c) Capacity Development and Training

To support timely and effective implementation of environmental and social project components and mitigation measures, the ESMP draws on the environmental and social assessment of the existence, role, and capability of responsible parties on site or at the agency and ministry level.

Specifically, the ESMP provides a specific description of institutional arrangements, identifying which party is responsible for carrying out the mitigation and monitoring measures (e. g., for operation, supervision, enforcement, monitoring of implementation, remedial action, financing, reporting, and staff training).

To strengthen environmental and social management capability in the agencies responsible for implementation, the ESMP recommends the establishment or expansion of the parties responsible, the training of staff and any additional measures that may be necessary to support implementation of mitigation measures and any other recommendations of the environmental and social assessment.

(d) Implementation Schedule and Cost Estimates

For all three aspects (mitigation, monitoring, and capacity development), the ESMP provides (a) an implementation schedule for measures that must be carried out as part of the project, showing phasing and coordination with overall project implementation plans; and (b) the capital and recurrent cost estimates and sources of funds for implementing the ESMP. These figures are also integrated into the total project cost tables.

(e) Integration of ESMP with Project

The Borrower's (GOVSVG) decision to proceed with a project, and the Bank's (World Bank) decision to support it, are predicated in part on the expectation that the ESMP will be executed effectively. Consequently, each of the measures and actions to be implemented will be clearly specified, including the individual mitigation and monitoring measures and actions and the institutional responsibilities relating to each, and the costs of so doing will be integrated into the project's overall planning, design, budget, and implementation.

