THE BAHAMAS WATER SUPPLY AND SANITATION SYSTEMS UPGRADE PROGRAM

(BH-L1061)

Component 3 - Access to Potable Water Supply

Environmental and Social Assessment (ESA) &

Environmental and Social Management Plan (ESMP)

Bimini Port Royal

December 2025

TABLE OF CONTENTS

List of Figures

List of Tables

EXECUTIVE SUMMARY

This Environmental and Social Assessment and Environmental and Social Management Plan (ESA/ESMP), prepared under the IDB-funded Water Supply and Sanitation Systems Upgrade Program (BH-L1061) and implemented by the Water and Sewerage Corporation (WSC), evaluates the potential environmental and social impacts of the Port Royal water mains installation in South Bimini. The project will enhance access to safe and reliable piped water, improving public health, equity, and community resilience. Short-term impacts such as dust, noise, vegetation disturbance, and temporary access restrictions may occur during construction. These impacts will be effectively managed through site-specific mitigation and monitoring measures designed to ensure environmental protection and community safety. The ESA/ESMP also includes supporting management plans for environmental protection, community health and safety, stakeholder engagement, and grievance redress to promote transparency and responsiveness. With these safeguards in place, the Port Royal water mains installation is expected to have low environmental and social risk while delivering lasting public health and socio-economic benefits for the South Bimini community.

Abbreviations

AMI	Advanced Metering Infrastructure
AoI	Area of Influence
BPL	Bahamas Power and Light
CoC	Code of Conduct
DAoI	Direct Area of Influence
DCC	Disaster Consultative Committee (DCC)
DEPP	Department of Environmental Planning and Protection
DMAs	District Metered Areas
EA	Executing Agency
E&S	Environmental and Social
EHSS	Environmental, Health, Safety and Social
ESAP	Environmental and Social Action Plan
ESF	Emergency Support Function
ESMPc	Environmental and Social Management Plan at the Construction Stage
ESPF	Environmental and Social Policy Framework
ESPS	Environmental and Social Performance Standards
FIA	Family Island Administrators
GHG	Greenhouse Gas
GoTB	Government of The Bahamas
GRM	Grievance Redress Mechanism
IAoI	Indirect Area of Influence
IDB	Inter-American Development Bank
IWA	International Water Association
KBA	Key Biodiversity Area
LMP	Labour Management Procedure
LS	Lift Station
NEMA	National Emergency Management Agency
NRW	Non-Revenue Water
PA	Protected Areas
PEU	Project Execution Unit
PMH	Princess Margaret Hospital
PPE	Personal Protective Equipment
SESA	Strategic Environmental and Social Assessment
SESMP	Strategic Environmental and Social Management Plan
URCA	Utilities Regulation and Competition Authority
USD	United States Dollars
WSC	Water and Sewerage Corporation
WWTP	Wastewater Treatment Plant

1 INTRODUCTION

1.1 BACKGROUND

This Environmental and Social Assessment (ESA) forms part of the broader Environmental and Social Management Framework under the Inter-American Development Bank (IDB)-funded Water Supply and Sanitation Systems Upgrade Program in The Bahamas (BH-L1061), implemented by the Water and Sewerage Corporation (WSC). This document specifically addresses environmental and social risks, mitigation strategies, and compliance requirements associated with the Port Royal water mains installation works in South Bimini, a key activity under *Component 3: Access to Potable Water Supply*.

Port Royal, located in South Bimini, is a small, seasonally active residential community characterized by unpaved but compacted sand and rock roads, naturally vegetated shoulders, and low-lying terrain. Water pooling often occurs in certain sections after rainfall due to the absence of formal drainage infrastructure. These baseline conditions require careful planning to prevent erosion, manage runoff, and avoid disturbance to natural landforms during trenching and pipe-laying operations.

Socially, the project is expected to deliver substantial improvements to household well-being, equity, and quality of life. Residents currently rely on private wells, bottled water, and rainwater catchment systems, which are costly and unreliable. By expanding piped water access, this project directly enhances public health, household savings, and social resilience, while strengthening community stability during peak seasonal occupancy. Although Port Royal has limited commercial activity, the improved water infrastructure will contribute to long-term sustainability, reducing service disruptions and supporting residential growth.

Port Royal is a canal-based community, with homes surrounded by vegetated buffers and inland access roads. While the project area does not overlap with designated protected areas or ecologically sensitive zones, the community's layout near waterways calls for careful environmental management. Roadways and natural vegetation buffers reduce the risk of storm water runoff entering canals, but good housekeeping, material stockpile control, and storm-preparedness protocols are essential to maintain environmental integrity and climate resilience.

1.2 OBJECTIVES

The main objectives of this Environmental and Social Assessment (ESA) are to:

- Conduct an expedited diagnosis of the environmental and social baseline of the project intervention area;
- Identify and assess the main environmental and social impacts and risks across the construction, operation, and closing stages of the project; and
- Define the mitigation measures and management procedures required to minimize these impacts and outline the structure of the Project's Environmental and Social Management Plan (ESMP).

This assessment evaluates the potential physical, biological, and social impacts of construction activities along the project corridor and outlines the measures required to ensure compliance with The Bahamas' national environmental legislation, including the *Environmental Planning and Protection Act (2019)* and

the *Environmental Impact Assessment Regulations (2020)*, as well as the Inter-American Development Bank's (IDB) Environmental and Social Performance Standards (ESPS).

The ESA serves as the foundation for contractor obligations under the Contractor's Environmental and Social Management Plan (ESMPc), which guides the site-specific implementation of mitigation actions, monitoring, and social safeguards throughout the construction and operational phases.

1.3 STRUCTURE OF THE REPORT

The structure of this report is designed to align with IDB safeguards requirements and national regulatory frameworks. The report includes:

- A detailed description of the project scope and area of influence;
- Baseline environmental and social conditions, including physical, biological, and socio-economic context;
- Assessment of potential environmental and social risks and impacts;
- Mitigation measures and environmental management procedures;
- A dedicated Environmental and Social Management Plan (ESMP), including monitoring, supervision, and grievance redress mechanism;
- Institutional roles, responsibilities, and reporting requirements.

The analysis focuses on key environmental aspects such as:

- Air quality and dust control, particularly during dry and windy conditions;
- Soil erosion and stormwater management, given the sandy and unpaved character of the area;
- Vegetation disturbance, especially of roadside native plants;
- Noise which may affect the flora and fauna in and around the project area

It also considers key social risks and opportunities, including:

- Temporary disturbances to communities during construction, such as road access disruptions or noise;
- Roadway health and safety, potential traffic congestion as well as risks of vehicular and pedestrian accidents along this essential corridor.
- The importance of transparent communication and stakeholder engagement;
- Long-term gains in public health, service delivery, and institutional functionality;
- The role of water access in advancing social equity, community resilience, and local development.

This assessment also reinforces the need for structured environmental and social supervision by WSC and its contractors, including:

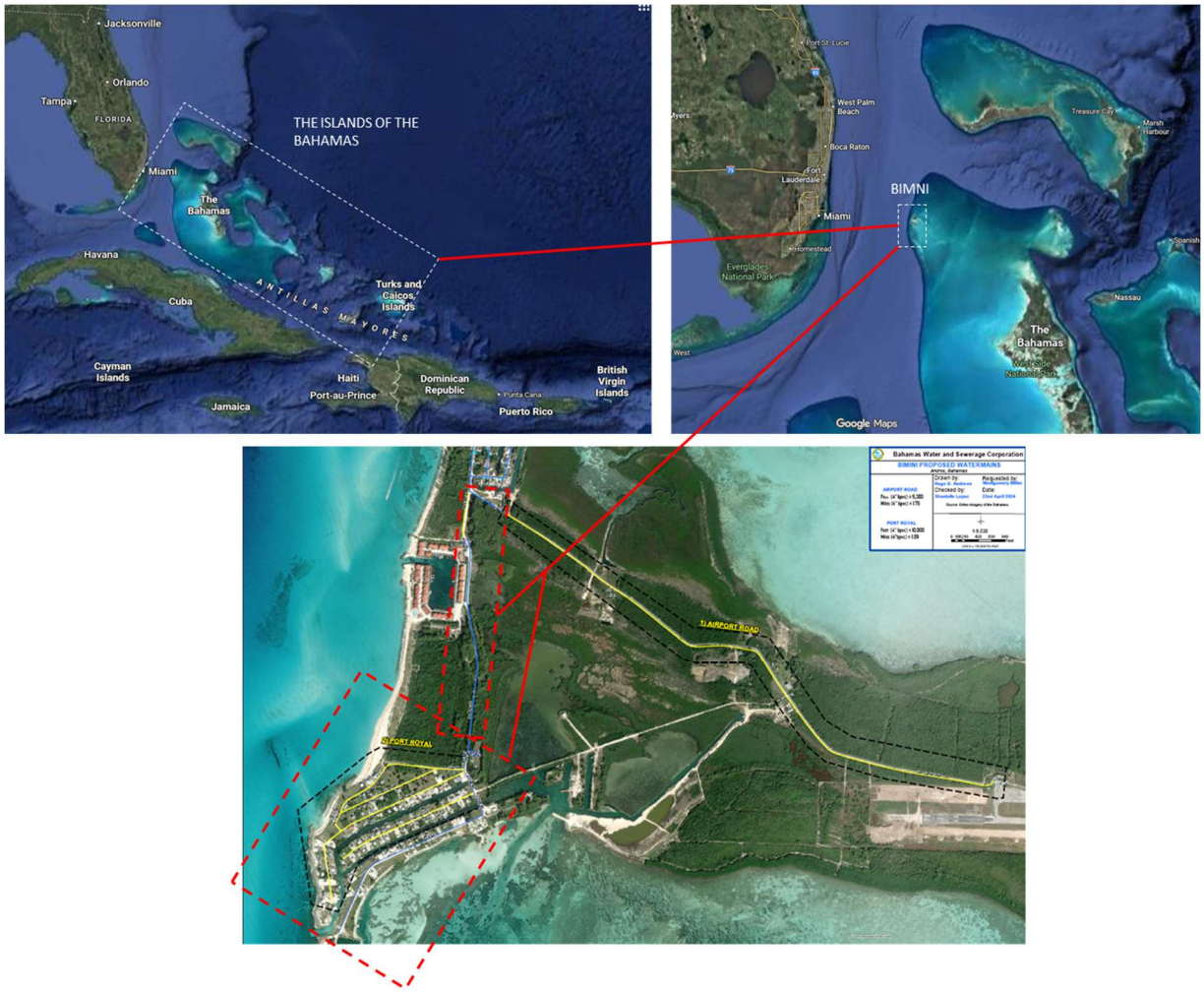
- Clear monitoring responsibilities;
- Documentation of compliance with environmental and social safeguards;
- Integration with national disaster and emergency response protocols, particularly during hurricane season;

- Use of a functioning Grievance Redress Mechanism (GRM) to ensure that community, employees and workers concerns are addressed in a timely and transparent manner.

With appropriate mitigation measures, social engagement protocols, and consistent monitoring and evaluation Port Royal works are expected to have low residual environmental and social risks and bring substantial long-term improvements to water security, community health, service equity, and infrastructure reliability for residents, visitors, and businesses in Bimini.

2 DESCRIPTION OF THE PROGRAM AND PROJECT

Component 3 aims to expand water supply infrastructure across islands with historically limited access to piped potable water. In Bimini, the works are divided into two implementation corridors: Airport Road and Port Royal, with this environmental and social assessment specifically addressing the Port Royal alignment in South Bimini.



The Port Royal alignment includes an access road that provides the primary vehicular route for residents. This roadway is narrow and lightly trafficked, serving mainly Port Royal residential homes and The Bimini Cove Resort and Marina property. Throughout this report the Project will be referred to as Port Royal, which includes the residential community and the access road leading up to the community. Road conditions vary along the alignment, with some sections semi-paved and others showing noticeable surface wear resulting from periodic inundation during heavy rainfall and routine daily use.

Photo 1. Port Royal Access Road (P-1)

Port Royal subdivision is a small, low-density residential subdivision in South Bimini, comprising approximately 145 buildings and a single church, largely characterised by vacation homes rather than permanent, high-density settlements. The intervention will benefit an estimated 100 lateral connections (roughly 300 persons) in the area. The road infrastructure is modest, with no formal sidewalks, limited commercial infrastructure, and many occupants relying on alternative water sources, including private wells and rainwater catchment.

Trenching activities will extend beyond the internal road network of Port Royal to include the entrance road leading into the subdivision, beginning in front of Bimini Cove Resort. This section of trenching is required to connect to the existing water main that serves as the source of the project tie-in. As a result, the entrance road and frontage area adjacent to Bimini Cove Resort are included within the project's Direct Area of Influence.

Despite this inclusion, the proposed works will not affect the operations, access, or water service of Bimini Cove Resort. No interruptions to resort services are anticipated, and construction activities will be managed to ensure continued access and minimal inconvenience. The scope of works in this area is limited to the water main connection and does not involve modifications to resort infrastructure or utilities.

Unique to this community, the residential structures are elevated built on reinforced stilts or piers. These homes are designed to reduce flood exposure by raising the living quarters above the ground level, which is especially useful in areas with variable terrain and localized water pooling. The ground level is typically left open or used for parking and storage. Located along the canal, these properties provide direct waterway access for boating and recreational use. Surrounding lots often include natural vegetation buffers, with driveways and roads composed of compacted sand and rock rather than formal paving.

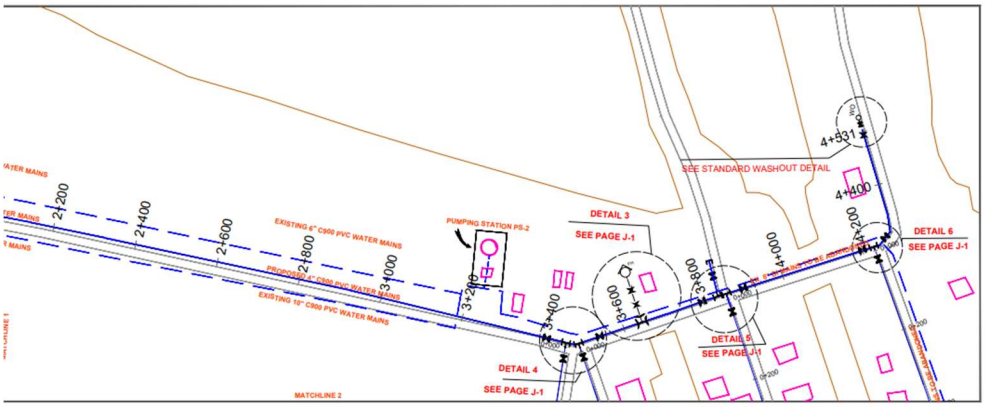
Photo 2. Port Royal Community (P-2)

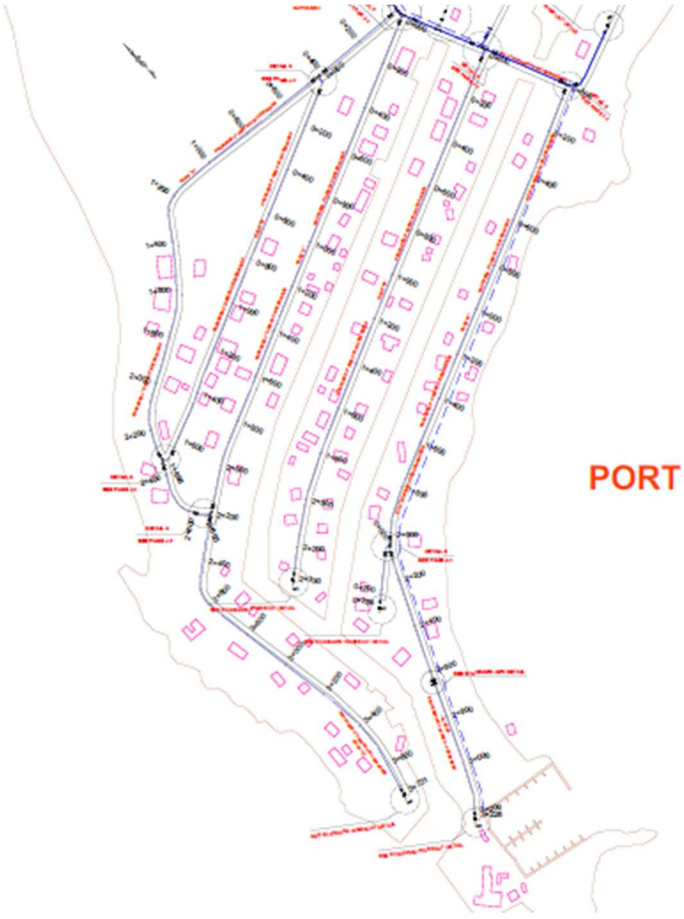
The planned activities include:

- Trenching of approximately 18,485 linear feet for 4-inch and 6-inch PVC water mains;
- Installation of service lateral connections;
- Backfilling, site restoration, and reinstatement of affected areas.

The project will have a designated, fenced in, lay down area, close to the site, where materials and equipment will be stored and refuelling can take place.

Photo 3. Proposed Laydown Area





PORT ROYAL SETTLEMENT

Trenching (16 inches) will be conducted along the edge of existing compacted sand and rock roadways, adjacent to residential properties and vegetated setbacks, as per the drawing specifications in *Appendix C*. While the area is not formally paved, the corridor features stable yet permeable road surfaces. Environmental sensitivities include the absence of engineered drainage infrastructure, localized terrain variation, and the potential for water pooling in depressions following heavy rainfall. These conditions will influence construction phasing, equipment mobility, and the need for active erosion and sediment control measures during implementation.

From a social standpoint, the project is expected to bring substantial public health and equity benefits to the community. The area currently lacks connection to the central water distribution network, and residents primarily depend on private wells, bottled water, and rainwater harvesting systems to meet their daily needs. These sources are often inconsistent, costly, and susceptible to contamination, particularly during periods of heavy rainfall or extended dry spells. By extending piped water infrastructure to Port Royal, the project will significantly enhance the reliability, affordability, and quality of potable water for residents.

2.1.1 Project Implementation, Supervision, and Management

The implementation of activities under Component 3: Access to Potable Water in Port Royal, South Bimini will be carried out collaboratively between the Water and Sewerage Corporation (WSC) and the appointed contractor. The contractor will be responsible for the direct execution of all construction and installation works, including trenching, pipe-laying, reinstatement, and associated environmental and social management measures. The contractor will also be responsible for ensuring adherence to environmental, occupational health and safety (OHS), and community engagement requirements as outlined in the Environmental and Social Management Plan (ESMP) and the Site Environmental and Social Management Plan (SESMP).

The WSC Site Supervisor will have overall oversight of field implementation and compliance with safety, environmental, and social standards. This individual will serve as the primary liaison between the WSC Project Management Unit (PMU) and the contractor, conducting regular site inspections, verifying the proper use of Personal Protective Equipment (PPE), ensuring that mitigation and monitoring measures are implemented as planned, and certifying adherence to performance and safety requirements. The Site Supervisor will also coordinate with the WSC Social and Environmental Specialists, who will monitor grievance management, stakeholder engagement, and social performance indicators.

The WSC Project Management Unit (PMU) will be responsible for the overall coordination, supervision, and reporting of project activities. The PMU will review all contractor submissions, including daily safety reports, monitoring logs, and compliance documentation, to ensure conformity with national regulations and IDB safeguard requirements. The PMU will also oversee the contractor's performance in implementing the Occupational Health and Safety Subprogram, Community Health and Safety Subprogram, Labor Management Procedure, Disaster Risk Management, Community Information and Participation, Coordination with Service Providers, Chance Find Procedure, and Traffic and Pedestrian Management Plan.

The contractor will be required to hold daily toolbox meetings and ensure continuous supervision of all work activities, while the WSC Site Supervisor will perform weekly inspections and report to the PMU on progress, safety compliance, and social or environmental issues observed in the field. The Social

Specialist will oversee the Grievance Redress Mechanism (GRM), ensuring that community complaints are received, documented, and resolved promptly.

Overall, project management will operate through a three-tier structure:

1. Contractor – Implements construction works and ESMP measures.
2. WSC Site Supervisor – Provides on-site supervision, compliance verification, and reporting.
3. WSC PMU (Environmental and Social Specialists) – Provides overall project oversight, coordination, and reporting to IDB.

2.1.2 Costs and Financing

This structure ensures accountability, consistency, and compliance with both national regulations and IDB Environmental and Social Policy Standards (ESPS), while promoting safe, transparent, and efficient project execution throughout the Port Royal and Airport Road works in South Bimini.

The budget allocation for the Bimini Water Main Extension Project under Component 3 reflects the scale and logistical requirements of extending service across South Bimini. The Port Royal extension is estimated at $1,206,000.00 supporting both residential needs and infrastructure serving the tourism and transport sectors.

The works are expected to be completed within approximately eight months of continuous work.

2.1.3 Expected Benefits

In addition to improving household access, the new water mains will strengthen essential community resilience by supporting safe and dependable water delivery to nearby facilities and service providers. Although Port Royal is largely residential and sparsely populated, the area accommodates seasonal tourism and small-scale rental properties that contribute to the local economy. Reliable water service is therefore critical not only to public health but also to maintaining the attractiveness of the area for visitors and investors.

Overall, the project is anticipated to foster improved living standards, promote equity in service delivery, and enhance the social and economic stability of Port Royal. By reducing dependency on unregulated water sources, the initiative will also contribute to long-term sustainability and community well-being across South Bimini.

The new infrastructure also enables the interconnection of South Bimini's supply system with the broader island network, reducing reliance on isolated systems and supporting network redundancy and climate resilience.

In summary, the planned works in Port Royal, South Bimini represent a strategic investment in climate-resilient water infrastructure, delivering long-term social, environmental, and public health benefits. By improving service equity and strengthening access to potable water in one of the country's most exposed communities, the project advances both national development priorities and local quality of life.

3 LEGAL AND INSTITUTIONAL FRAMEWORK

The legal and institutional framework that was reviewed include The Bahamas Environmental Health Services Act, the Planning and Subdivision Act, and environmental permitting procedures required by the Department of Environmental Planning and Protection (DEPP).

This assessment and management plan aligns with the requirements of the IDB's Environmental and Social Policy Framework (ESPF), which addresses risk management, labour conditions, pollution control, community health and safety, biodiversity, gender equality, stakeholder engagement, and involuntary resettlement.

3.1 NATIONAL LEGAL FRAMEWORK

The first section of the chapter describes the national legal framework applicable to the Program. The most relevant national legislation, which governs the project are summarised below:

3.1.1 Environmental Licensing

The environmental licensing framework governing this project is established under The Bahamas' Environmental Planning and Protection Act (2019), Environmental Impact Assessment (EIA) Regulations (2020), and the Ministry of the Environment Act (2019). Together, these instruments form the foundation for environmental oversight, pollution control, and sustainable resource management within the country.

In accordance with these regulations, all major infrastructure projects, such as the water mains works in South Bimini, are subject to environmental review and approval through the Certificate of Environmental Clearance (CEC) process, administered by the Department of Environmental Planning and Protection (DEPP). The CEC ensures that project design, implementation, and operation adhere to national environmental standards and safeguard both ecological and community well-being.

For this project, the Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) required by DEPP to support the issuance of the CEC are being developed in partnership with a recognized and DEPP-approved consulting firm. This collaboration ensures that the assessment and management measures align with national regulatory expectations, international best practice, and the IDB's ESPS.

Act/Policy Title	Summary
Environmental Planning and Protection Act, 2019	The Act provides for the prevention or control of pollution, the regulation of activities and the administration, conservation and sustainable use of the environment and for connected purposes. The Act establishes the Department of Environmental Planning and Protection (DEPP) which in addition to the preceding, manages multilateral environmental agreements, and is responsible for the development and implementation of policies, programmes, and plans for the effective management and conservation of the physical environment within The Bahamas.
Environmental Planning and Protection (Extension of application) Order, 2020	The Environmental planning and protection (Extension of application) order applies throughout The Bahamas, including all islands and cays.

Environmental Impact Assessment Regulations, 2020	To provide procedures for a Certificate of Environmental Clearance (CEC). The Regulations provide procedures for the review of proposed projects inclusive of monitoring and compliance requirements. The Regulations dictate the requirements for a Certificate of Environmental Compliance (CEC).
Ministry of the Environment Act, 2019	This Act establishes the Ministry of the Environment to oversee the integrity of the environment of The Bahamas, to make the minister responsible therefore a corporation sole, to establish the environmental administration fund and the environmental trust fund and for matters connected thereto.

3.1.2 Potable Water, Quality, Supply

Act/Policy Title	Summary
Water and Sewerage Corporation Act, 1976	An Act to establish a Water and Sewerage Corporation for the grant and control of water rights, the protection of water resources, regulating the extraction, use and supply of water, the disposal of sewage and for connected purposes.
Water Supplies (Out Islands) Act, 1953	An Act to regulate and control public water supplies in the Out Islands. This Act makes provision for the water supply in the Out Islands. It mainly concerns the construction and maintenance of water supply systems and the conditions of supply of water to private consumers.
Water Supplies (Out Islands) Rules (Cap. 197)	These Rules concern the public supply of water to consumers at the Out Islands and related matters such as the construction of water supply works, rates, and repairs. The Minister may, on application, agree to supply water for domestic or other purposes in accordance with the provisions of the Water and Sewerage Act and these Rules. The Rules also concern requirements for plumbing and metering, prohibit illegal consumption and waste of water supplied through the public system and prescribe charges for water-related services.
Environmental Health Services Act, 1987	Provides the framework for environmental regulations that will ensure compliance for the Project. The Act authorized the DEHS to develop regulations that prevent and control air pollution, soil contamination and preserve water quality.
Environmental Planning and Protection Act (No. 40 of 2019)	The Director shall maintain within the Environmental Registry data on the sources of water, air and noise pollution, particularly data that identifies the quantity, conditions or concentrations relevant to the identification of each pollutant.
Out Islands Utilities Act	An Act to encourage the construction of water supply and sewerage disposal systems on Out Islands by providing

	for the refund of customs duties and certain other concessions to the developer of such systems. This Act makes provision with respect to the enhancement of public utilities construction works on the Out Islands such as water supply systems and sewerage systems. A developer who wishes to develop a utility project may apply to the Minister. The Minister may, through an agreement, license the developer to construct, maintain and operate the utility project at specified conditions. No utility project shall be constructed without the approval of the Minister.
Reclamation and Drainage Act	An Act to provide for reclamation and drainage of swampy areas. This Act makes provision for land reclamation and drainage of land ordered by the State. The Act shall apply in parts of the Bahamas that are declared by the Minister to be a reclamation area for purposes of this Act. The Minister may order landowners in a reclamation area to conduct land reclamation works and in case of neglect or refusal in respect of such order the Minister may direct a reclamation officer to carry out the work. The Act grants regulation making powers for purposes of the Act to the Minister.
Licensed Plumbers Rules	When undertaking any work for which a licensed plumber is authorized under the provisions of the Act, one must adhere to the requirements of this Regulation. In any premises intended for human habitation or occupation with a pure water supply, it shall not be connected to any impure water supply, nor shall it intersect through any plumbing fixture with the drainage system. Every building designated for human habitation that has a toilet or other plumbing fixture must have a water supply adequate in volume and pressure to flush said toilet or plumbing fixture. Furthermore, any pipe leading water to such toilet must be of an appropriate size to supply water at a rate necessary for proper flushing without unduly reducing the pressure in any other fixture.
Sewerage Rates Regulations	In determining the sum payable under regulation for sewerage services the building fixture specified in the first column of the Schedule shall be classified under the number of units set out respectively in the second column of the Schedule against each fixture.
Water Supply Rules	The Minister when requested in writing may agree to supply water to a consumer for domestic purposes or any other purpose in accordance with the Water and Sewerage Act. Water will not be supplied through any one metered connection with the supply main to more than two water closets. Where more than two water closets are installed in any new building on one proposed metered water connection or in any part of any new building such part

	being on one proposed metered water connection, then no water connection will be made until an independent water supply system has been installed to supply all the water closets in such new building or such part of a new building. If a third water closet is installed in a building or part of a building on an existing water connection, then the connection will be cut off unless an independent water supply system is installed to supply all the water closets in the said building or part of a building.

3.1.3 Effluent Discharge

Act/Policy Title	Summary
Environmental Health Services Act, 1987	Any individual who, contrary to the provisions of this Act and its regulations, releases or allows the release of any pollutant into the environment is committing an offense. Anyone who (a) discharges a pollutant or contaminating agent into the environment or (b) oversees a source that results in such discharge beyond regulatory limits must immediately notify the Director of such release. No person shall (a) modify or establish any facility or equipment capable of emitting pollutants; (b) change or undertake a production process that results in emissions; or (c) modify a production rate that alters the emission rate or manner, without prior certification approval from the Director endorsing the methods or devices used to control such emissions.

3.1.4 Solid Waste Management

Act/Policy Title	Summary
Environmental Health Services (Collection and Disposal of Waste) (Amendment) Regulations, 2013	These Regulations amend the Environmental Health Services (Collection and Disposal of Waste) Regulations, 2004 by repealing and replacing the Schedule. The Schedule, made under regulation 49, determines waste disposal charges for waste brought to a waste management facility. A waste disposal fee shall be assessed and shall be paid by all private collectors for each load of waste.
Environmental Protection (Control of Plastic Pollution) Act, 2019	An act to prohibit single use plastic food ware and non-biodegradable, oxo-biodegradable and biodegradable single use plastic bags; prohibit the release of balloons; regulate the use of compostable single use plastic bags, and for connected matters.
Environmental Health Services (Control of Plastic Pollution) Regulations, 2020	Where an environmental health officer, having inspected premises of a business pursuant to section 10 of the Environmental Protection (Control of Plastic Pollution) Act 2019, has reason to believe that the business has failed

	to comply with any provision of that Act, the officer may issue a notice of non-compliance.
Environmental Health Services Act, 1987	"Solid waste" includes ashes, garbage, refuse, litter, and other discarded solid material resulting from domestic, industrial, commercial, and agricultural operations and from community activities but does not include sewage. The Minister may prescribe regulations to effectuate and fulfill the purpose, intent, and provisions of this Act and, without prejudice to the generality of the foregoing, such regulations may provide for: subject to the provisions of Article 27 of the Constitution, the use, regulation, and control of beaches and coastal areas, both above and below the high-tide line, the removal of solid waste from them, and the cleaning and maintenance of the aforementioned beaches and areas, and generally for preserving the amenities thereof.

3.1.5 Hazardous Waste Management

Act/Policy Title	Summary
Environmental Health Services Act, 1987	"Solid waste" includes ashes, garbage, refuse, litter, and other discarded solid material resulting from domestic, industrial, commercial, and agricultural operations and from community activities but does not include sewage. The Minister may prescribe regulations to effectuate and fulfill the purpose, intent, and provisions of this Act and, without prejudice to the generality of the foregoing, such regulations may provide for: subject to the provisions of Article 27 of the Constitution, the use, regulation, and control of beaches and coastal areas, both above and below the high-tide line, the removal of solid waste from them, and the cleaning and maintenance of the aforementioned beaches and areas, and generally for preserving the amenities thereof.
International Regulations	
International Convention for the Prevention of Pollution from Ships (MARPOL), 1973, as modified by the Protocol of 1978 and Protocol of 1997 (Annexes I, II, III, IV, V & VI)	The Convention includes regulations aimed at preventing and minimizing pollution from ships - both accidental pollution and that from routine operations - and currently includes six technical Annexes. Special Areas with strict controls on operational discharges are included in most Annexes.
Stockholm Convention on Persistent Organic Pollutants, 2004	It aims to eliminate or restrict the production and use of persistent organic pollutants (POPs).

3.1.6 Occupational Health, Hygiene, and Safety

Act/Policy Title	Summary
Environmental Health Services Act, 1987	Legislation to advance the conservation and maintenance of the environment in the interest of public health, for proper sanitation concerning food and beverage matters, and more broadly, for the provision and oversight of services, activities, and other matters connected or incidental thereto. The Minister may issue regulations to effectuate and realize the purpose, intent, and provisions of this Act and, without limiting the scope of the foregoing, such regulations might provide for the establishment of standards for the hygienic maintenance and use of public sanitary facilities, restrooms, sinks, laundries, and dry cleaning establishments.
Health and Safety at Work Act	Law establishing provisions relating to occupational health and safety and other related purposes.
Health and Safety at Work (amendment)	The Health and Safety at Work Act has undergone an amendment targeting section 17. This revision establishes that any individual interfering with an inspector's duties, falsely claiming to be an inspector, altering official documents, or violating any aspect of the Act or its associated regulations is committing an offense. Penalties, upon summary conviction, range from a fine of five thousand dollars for a first-time offense (and additional charges for continuous offenses) to ten thousand dollars for recurrent violations. Legal action for these offenses can only commence with the Attorney General's direct involvement or endorsement.
Environmental Health (Fees for Services) Regulations, 1989	These Regulations, made under section 17 the Environmental Health Services Act, prescribe fees in respect of the services set out in the Schedule to these Regulations. Any fee or charge incurred in the performance of any service rendered may be recoverable summarily by the Minister and fees and charges shall be paid into the Consolidated Fund. Services include: inspection of cargos of ships and deratization of ships; analysis of drinking water; analysis of treatments involving pesticides; tests analysis of dairy products and food items; and hazardous waste analysis.
Health Rules Chapter 231	These Regulations make provision with respect to a wide variety of matters regarding public health in the Bahamas, including: abatement of nuisances (as defined); the keeping of animals (including birds, goats, pigs, horses and cattle) on premises; waste disposal and littering; discharge of wastewater in public drains; sewerage; digging and construction of wells and cisterns; protection of containers for the storage of water from mosquitoes; handling of food by diseased persons; notification of diseases affecting animals; sanitary conditions for the

	production, transportation, handling, storage and sale of foods and drugs (including drugs for animals; inspection of food establishments; special matters regarding dairies and the production and sale of (adulterated) milk and milk products; and labelling of dairy products.

3.1.7 Noise

Act/Policy Title	Summary
Environmental Health Services	The Minister may make regulations to give effect to and carry out the purpose, intent and provisions of this Act and, without prejudice to the generality of the foregoing, such regulations may provide for -the prevention and control of air pollution, including the control of emissions of smoke, gases, dust, dust, particulates, fumes or any combination thereof, offensive odors or excessive noise from factories, vessels, vehicles or any other premises or thing.

3.1.8 Historical Pollution

Act/Policy Title	Summary
Environmental Planning and Protection Law (Act N°40 of 2019)	Section 28 refers to the Liability for Historical Pollution, determining that the Director may require a person who has polluted the environment to take measures to rehabilitate the site by notice. If more than one person is found responsible, the liability shall be assessed against those persons on a pro rata basis. Section 36 refers to the Environmental Restoration Order, establishing that the Director may issue an environmental restoration order that requires a person to restore the environment as near as they can to the state it was in before. Moreover, the order shall award compensation to a person whose environment, property or livelihood has been harmed by the action which is the subject of the order.

3.1.9 Labor Legislation

Act/Policy Title	Summary
Apprenticeship Act Chapter 320	An Act to make provision for the regulation of the training of trade apprentices.
Employment Act, 2001	Act establishing the minimum working hours and paid vacations for workers; the provision of maternity and family leave; severance compensation; provisions concerning notice periods for termination of employment contracts;

	stipulations related to summary dismissals and wrongful terminations; regulations regarding the employment of children and young people; provisions concerning workers' wages; regulations on fingerprinting and lie detection; and for related purposes.
Health and Safety at Work Act Chapter 321 C	An Act to make provisions relating to health and safety at work and for connected purposes.
Public Works Act	An Act to provide for the construction, management, and development of public works, buildings and roads.
Industrial Relations (Validation of Trade Unions) Act, Chapter 321D	An Act to validate certain Trade Unions deemed not to exist in consequence of failure to comply with transitional requirements of the Industrial Relations Act upon the repeal by it of the Trade Union and Industrial Conciliation Act.
Industrial Relations Act Chapter 321	An Act to provide for the registration and control of trade unions; for the recognition of trade unions by employers; for the registration of certain Industrial Agreements; for the establishment of an Industrial Tribunal and the regulation of trade disputes; for the repeal of certain parts of the Trade Union and Industrial Conciliation Act; and for other matters connected with or incidental to the aforesaid purposes.
Minimum Wages Act Chapter 321B	An Act to make provisions for minimum wages in employments and for connected purposes.
Recruiting of Workers Act Chapter 318	An Act to regulate the recruitment of workers.
International Regulations	
Forced Labor Convention, 1930 (No. 29)	It prohibits the use of forced or compulsory labor in all its forms, considering that the term “forced or compulsory labor” shall mean all work or service which is exacted from any person under the menace of any penalty and for which the said person has not offered himself voluntarily.
Freedom of Association and Protection of the Right to Organize Convention, 1948 (No.87)	It states workers and employers, without distinction whatsoever, shall have the right to establish and, subject only to the rules of the organization concerned, to join organizations of their own choosing without previous authorization.
Right to Organize and Collective Bargaining Convention, 1949 (No. 98)	It states workers shall enjoy adequate protection against acts of anti-union discrimination in respect of their employment.
C100 - Equal Remuneration Convention, 1951 (No. 100)	It states men and women workers shall be equally remunerated for work of equal value. It refers to rates of remuneration established without discrimination based on sex.

Abolition of Forced Labor Convention, 1957 (No. 105)	It states the obligation to suppress and not to make use of any form of forced or compulsory labor-- (a) as a means of political coercion or education or as a punishment for holding or expressing political views or views ideologically opposed to the established political, social or economic system; (b) as a method of mobilizing and using labor for purposes of economic development; (c) as a means of labor discipline; (d) as a punishment for having participated in strikes; (e) as a means of racial, social, national or religious discrimination.
Discrimination (Employment and Occupation) Convention, 1958 (No. 111)	It states the obligation to declare and pursue a national policy designed to promote equality of opportunity and treatment in respect of employment and occupation, with a view to eliminating any discrimination in respect thereof. The term discrimination includes (a) any distinction, exclusion or preference made based on race, color, sex, religion, political opinion, national extraction, or social origin, which has the effect of nullifying or impairing equality of opportunity or treatment in employment or occupation.
Minimum Age Convention, 1973 (No. 138)	It states the obligation to pursue a national policy designed to ensure the effective abolition of child labor and to raise progressively the minimum age for admission to employment or work to a level consistent with the fullest physical and mental development of young persons.
Worst Forms of Child Labor Convention, 1999	It states the obligation to take immediate and effective measures to secure the prohibition and elimination of the worst forms of child labor as a matter of urgency. For the purposes of this Convention, the term child shall apply to all persons under the age of 18, and the term the worst forms of child labor comprises: (a) all forms of slavery or practices similar to slavery, such as the sale and trafficking of children, debt bondage and serfdom and forced or compulsory labor, including forced or compulsory recruitment of children for use in armed conflict; (b) the use, procuring or offering of a child for prostitution, for the production of pornography or for pornographic performances; (c) the use, procuring or offering of a child for illicit activities, in particular for the production and trafficking of drugs as defined in the relevant international treaties; (d) work which, by its nature or the circumstances in which it is

	carried out, is likely to harm the health, safety or morals of children.
Maritime Labor Convention, 2006, as amended (MLC, 2006)	It states the obligation to secure the right of all seafarers to decent employment.

3.1.10 Flora, Fauna, and Native Forest

Act/Policy Title	Summary
Forestry Act, 2010	Provides regulatory framework for the management of forestlands and protected species of trees and other plants, which are either threatened, endangered, or endemic to The Bahamas.
Forestry Amendment Act	Regulation 36 of the principal Regulations is amended by inserting immediately after the sub-regulation the following new subregulation (3A) -- "(3A) The Minister, acting on the advice of the Director of Forestry, may where a hurricane, tornado or any other natural disaster has occurred on any island, islet or cay in The Bahamas which causes serious damage to any forest or non-forest product in any designated forest, forest estate, forest reserve, conservation forest or protected forest, reserve the right to make special provision for the reduction of fees payable as specified in the Second Schedule, for royalties, permits and licenses for the purposes of these regulations".
Declaration of Protected Trees Order, 2021	This Order declares protected trees for the management, development, and protection of the forest resources of The Bahamas. The Schedule of this Order lists the trees which are endemic or endangered or threatened in Part I and trees which are of cultural or historical or economic significance in Part II.
Forestry Regulations	The Minister may grant leases to Bahamian governmental and nongovernmental bodies for a period not exceeding 99 years for the use of land within a forest reserve, protected forest, and conservation forest for purposes other than the utilization of forest produce under section 17 (1) (a), 17 (1) (b) and 17 (1) (c) of the Act. All applications for leases in respect of Crown land vested in the Minister within forest reserves, protected forests and conservation forests shall be submitted to the Director of Forestry, who shall forward the applications with his recommendations to the Minister.

Wildlife Conservation and Trade	Law implementing the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), focused on the protection of wild species and the damage caused by unsustainable exploitation.
Accidental Fires Act (Cap. 74)	This Act provides for relief from liability for accidental fires. However, this relief shall not affect the civil liability of any person for any negligent or willful act or omission or the criminal or contractual liability of any person.
Wild Animals Protection Act, 1968	Prohibits the taking, capturing, or hunting of any animal without a permit.
Wild Birds Protection Act, 1952	Prohibits the taking, capturing, or hunting of any animal without a permit. Protects birds and eggs during closed season.
Marine Mammal Protection Act, 2005	This Act sets forth provisions to protect marine mammals, including prohibiting the import of marine mammals and barring illegal taking, harassing, and otherwise harming marine mammals, among other guidelines.
Conservation and Protection of the Physical Landscape of The Bahamas Act, 1997	Protects physical landscape from environmental degradation, flooding, and removal of hills; regulates filling of wetlands, drainage basins or ponds; prohibits digging or removing sand from beaches and sand dunes; prevents harvesting or removing protected trees. In order to perform activities that may affect the physical landscape of The Bahamas, permits must be obtained for these activities. The Department of Physical Planning issues the permits and enforces the regulations.
Coast Protection Act, 1968	This Act makes provision for the protection of the coast against erosion and encroachment by the sea and for purposes connected therewith.
National Policies and Reports	
National Invasive Species Strategy, 2003	Provides a national framework for the prevention, control, and eradication of invasive plant and animal species in The Bahamas.
National Biodiversity Strategy and Action Plan (NBSAP)	Outlines goals for the conservation and sustainable use of biodiversity in The Bahamas. Encourages protection of native ecosystems, restoration of disturbed areas, and integration of biodiversity safeguards into infrastructure development. Supports the project's commitment to flora/fauna protection and buffer zone restoration.

3.1.11 Gaseous Emissions Management

National Policies and Reports

Third National Communication (TNC) of The Commonwealth of The Bahamas to the United Nations Framework Convention on Climate Change (UNFCCC), 2024	The TNC outlines The Bahamas' greenhouse gas emissions profile, national vulnerabilities, and adaptation priorities. It highlights water scarcity, saltwater intrusion, and infrastructure damage as key risks, especially in low-lying islands. The report calls for improved climate-resilient water systems and better data for adaptation planning—directly supporting the design rationale of the Port Royal water mains project.
Vision 2040 – National Development Plan (Climate Adaptation Chapter)	This long-term development framework incorporates climate resilience across economic, environmental, and infrastructural pillars. The plan calls for robust disaster risk governance, sustainable water management, and reduced vulnerability in Family Island communities.
State of the Environment Report (Draft)	Although not finalized, the draft provides baseline information on climate-related pressures and vulnerabilities across sectors, including freshwater availability, infrastructure exposure, and land degradation. It reinforces the importance of environmental monitoring and safeguards in Family Island infrastructure projects.
National Policy for the Adaptation to Climate Change, 2005	The National Climate Change Policy (2005) was The Bahamas' first formal policy framework aimed at addressing the causes and impacts of climate change. It was developed to fulfill national commitments under the United Nations Framework Convention on Climate Change (UNFCCC) and sets the foundation for integrating climate change into national development planning.
Act/Policy Title	**Summary**
Disaster Risk Management Act, 2022	This Act establishes the legal framework for disaster risk governance, preparedness, response, recovery, and resilience building in The Bahamas. It also creates the Disaster Risk Management Authority (DRMA) as the lead coordinating body and executor of the Act.
Environmental Health Services	The Minister may make regulations to give effect to and carry out the purpose, intent and provisions of this Act and, without prejudice to the generality of the foregoing, such regulations may provide for -the prevention and control of air pollution, including the control of emissions of smoke, gases, dust, dust, particulates, fumes or any combination thereof, offensive odors or excessive noise from factories, vessels, vehicles or any other premises.
Climate Change and Carbon Market Initiatives Act, 2022 (Act No. 15 of 2022)	Gives effect to the Paris Agreement, to aid in the global response to the threat of climate change

	and to create and implement the initiatives to offset carbon emissions.
International Regulations	
Montreal Protocol on Substances that Deplete the Ozone Layer, 1987	It was designed to stop the production and import of ozone depleting substances and reduce their concentration in the atmosphere to help protect the earth's ozone layer. It regulates the production and consumption of nearly 100 man-made chemicals referred to as ozone depleting substances.
Kyoto Protocol, 1992	It commits state parties to reduce greenhouse gas emissions, based on the scientific consensus that global warming is occurring and that human-made CO2 emissions are driving it.
The Paris Agreement, 2015	One of the primary goals of the Agreement is to pursue a development trajectory characterized by low greenhouse gas emissions, ensuring that food production remains uncompromised. The Agreement aims to contain the global average temperature increase well below 2°C relative to pre-industrial levels, with continued efforts to further limit this increase to 1.5°C. To achieve this, the signatories intend to peak global greenhouse gas emissions as soon as possible. It is acknowledged that developing nations will require more time to reach this zenith, and once achieved, there will be a swift decline in emissions. Developing nations are expected to augment their mitigation measures. Over time, they are encouraged to adopt comprehensive emission reduction or limitation objectives, considering their distinct national circumstances. Least developed countries and small island developing states have the provision to devise and convey strategies, plans, and actions for low greenhouse gas emission development, reflecting their unique situations.
United Nations Framework Convention on Climate Change (UNFCCC)	The United Nations Framework Convention on Climate Change (UNFCCC) established an international environmental treaty to combat "dangerous human interference with the climate system". All parties should promote and support the development, application, and diffusion, including transfer, of technologies, practices and processes that control, reduce or prevent anthropogenic emissions of greenhouse gases not controlled by the Montreal Protocol in all sectors, including energy, transport, industry, agriculture, forestry and waste management. In addition, they should promote sustainable management and

	cooperatively support the conservation and enhancement of sinks and reservoirs of all greenhouse gases not controlled by the Montreal Protocol, including biomass, forests and oceans, as well as other terrestrial, coastal and marine ecosystems. Each party should submit to the Conference of the Parties a national inventory, within its capabilities, of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, using comparable methodologies to be promoted and approved by the Conference of the Parties.

3.1.12 Energy

Act/Policy Title	Summary
Bahamas Electricity Corporation (Vesting Of Land) Act No. 2 of 1958	Act Granting the Bahamas Electricity Corporation a land extension located on the Southern Side of New Providence Island, which constitutes a portion of Clifton Estate, with said land being separated by an existing thirty-foot-wide public roadway.
Electricity Act, 2015	Its objective is to overhaul the country's energy sector and edict policy targets, among others: 1) security and diversification of power supply and distribution, 2) access to cheap and reliable environmentally sustainable electricity, 3) and the establishment of the Utilities Regulations and Competition Authority (URCA) as the independent regulator of the sector. The Act encourages a higher capacity of renewables electricity generation under several ways. It seeks a reorganization of the electricity sector, so that public suppliers shall increase the proportion of renewables in their generation mix. It also promotes residential renewable energy generation for connection to the grid, and for self-generation. All stages are regulated by Utilities Regulation & Competition Authority (URCA).
The Bahamas National Energy Policy (2013 – 2033)	Sets out a long-term vision for a modern, diversified, efficient and resilient energy sector; emphasizes affordability, low-carbon technologies, and reducing reliance on imported fossil fuels.
Draft The Bahamas National Energy Policy (2025-2030)	Updates the previous policy; prioritizes renewable energy deployment, battery storage, micro-grids for Family Islands, and incentives for clean technology.

3.1.13 Vehicular Traffic

National Regulations	
Road Traffic Act	An Act to declare, amend and codify the law relating to motor vehicles, and to regulate traffic on highways and of motor vehicles; to establish a Road Traffic Authority; to protect third parties against risks arising from the use of motor vehicles; to amend the law with respect to the licensing of motor vehicles operated for hire or reward, and to regulate public transportation services; and to regulate matters relating to the above matters.
Road Traffic (vehicle inspection)	The owner of a motor vehicle applying for the registration of such vehicle shall present the vehicle to the Inspector for inspection and shall provide him with the data required in the application for registration of a motor vehicle.

3.1.14 Cultural Heritage, Archaeological and Historical Sites

National Regulations	
The Bahamas National Trust Act, Chapter 391	An Act to incorporate and confer powers upon The Bahamas National Trust for Places of Historic Interest or Natural Beauty.
Antiquities, Monuments and Museum Act, 1998	This law provides for the preservation, conservation, and restoration of historical, paleontological and archaeological resources.

3.1.15 Other Laws/ Regulations

Act/Policy Title	Summary
Bahamas National Maritime Policy, 2015	This Policy was established in 2015 and updated in 2017 to ensure the sustainable development of the Maritime sector, protection of the marine environment, and to utilize the valuable resources efficiently and effectively within The Bahamas.
Port Authorities Act, 2006	This Act sets forth provisions appointing port authorities to all ports and harbors of the Bahamas to better regulate and control port operations.
Planning and Subdivision Act, 2010	An Act to combine, consolidate and revise the law relating to town planning and the law relating to the development of subdivisions and to provide for matters connected thereto. The purposes of this Act include ensuring the efficient and orderly provision of infrastructure

	and services to the built environment and promoting sustainable development in a healthy natural environment.
Local Government Act, 1996	This Act divides the Family Islands into 23 districts, each administered by a District Council. With this Act, much authority has devolved from Central Government to the District Councils. The Council and their respective Town Committees are responsible for town planning, licensing and administering budgets. They are also mandated to create open spaces for community use, including recreational parks and to provide community services, such as water, health care, sanitation, and waste collection and disposal.

4 IDB ENVIRONMENTAL AND SOCIAL POLICY FRAMEWORK

This section presents a summary of the Environmental and Social Performance Standards (ESPS) that are relevant to the project.

ESPS 1: Assessment and Management of Environmental and Social Risks and Impacts

ESPS 1 is the basis of the ESMP, requiring systematic identification, assessment, and management of potential risks throughout the project life cycle. In Port Royal, anticipated risks include construction-related dust, noise, localized water pooling during rain events, vegetation clearance along road verges, and short-term access disruptions for residents and property owners.

The Port Royal alignment passes through a canal-based residential subdivision with compacted rock and sand roadways, natural vegetation buffers, and a mix of elevated seasonal and permanent homes. While the area is not formally urbanized, it includes utility easements and well-defined property boundaries, which require careful coordination to avoid nuisance impacts and ensure right-of-way access is respected.

From a social perspective, the project addresses long-standing water security gaps in the South Bimini community. Many homes depend on private wells, rainwater catchment, or bottled supplies. Timely installation of the water mains will reduce household vulnerability, support public health, and enhance resilience for both permanent residents and seasonal visitors. The ESMP embeds clear community engagement protocols, including grievance redress, to ensure residents remain informed and concerns are addressed throughout implementation.

This plan builds upon the Strategic Environmental and Social Assessment (SESA) and contextualizes those findings for the terrain, settlement pattern, and environmental sensitivities unique to Port Royal.

ESPS 2: Labour and Working Conditions

This standard ensures that all workers engaged in the project are treated fairly, operate under safe conditions, and have access to grievance redress mechanisms. For this project, ESPS 2 requires that the contractor provide proper Personal Protective Equipment (PPE), training on equipment and safety procedures, and fair terms of employment to both WSC staff and contracted workers. It prohibits child or forced labour and requires measures to prevent discrimination, harassment, or gender-based violence in the workplace. In the context of South Bimini, ESPS 2 also underscores the importance of hiring locally where possible, thus providing income opportunities while ensuring workers are safeguarded under a clear Labour Management Procedure (LMP).

ESPS 3: Resource Efficiency and Pollution Prevention

ESPS 3 is applicable to the Port Royal Water Mains works due to the nature of construction activities involved namely, excavation, material handling, vehicle and equipment operation, and temporary storage of supplies, which inherently generate solid waste, noise, dust, and pose risks of fuel or lubricant spills. The applicability of this standard is based on the potential for environmental degradation linked to pollution and inefficient resource use.

While the project's physical footprint is narrow and localized along a roadside corridor, site conditions such as unpaved shoulders, sandy soils, and the lack of formal drainage infrastructure elevate the risk of erosion, sedimentation, and surface runoff during rainfall events. Without proper mitigation, these conditions could lead to particulate emissions, water quality degradation, and short-term disruption of nearby drainage channels.

To comply with ESPS 3, contractors will be required to implement resource efficiency and pollution prevention measures, into the Contractor's Environmental and Social Management Plan (ESMPc), with oversight from WSC and the supervising engineer. Additionally, all machinery must be regularly serviced to reduce emissions, and fuel or chemical storage must follow national environmental guidelines to prevent accidental releases. Given the scale and nature of the works, with appropriate mitigation, the residual environmental impacts are expected to be low, localized, and fully manageable.

ESPS 4: Community Health, Safety, and Security

Port Royal is a low-traffic residential community where roadways are shared by pedestrians, vehicles, and seasonal property owners. ESPS 4 is triggered due to the need to protect community members from construction-related risks. This includes maintaining access to homes, controlling dust and noise, and ensuring that excavation zones are clearly marked and secured. Although heavy machinery use will be limited, safety signage, work zone barricades, and daily supervision will be implemented to safeguard residents and workers.

The community's proximity to the canal means that extra care must be taken to prevent construction debris or contaminants from reaching the waterway. While direct runoff is unlikely due to the positioning of homes and vegetation buffers between the road and canal, proper housekeeping will be essential. The project will also promote sanitation, and hygiene measures on site (workers will be required to access chemical toilets at laydown yard).

By applying ESPS 4, the project ensures a proactive approach to minimizing disturbance, enhancing safety, and protecting the well-being of the Port Royal community during the construction phase.

ESPS 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources

The Port Royal works trigger ESPS 6 due to the presence of native roadside vegetation and proximity to canal-side ecological buffers. While the project's area of influence is not in protected areas, Key Biodiversity Areas (KBAs), or Important Bird Areas (IBAs), it contains vegetation typical of coastal shrublands, classified under the Caribbean Vegetation Classification System (Areces-Mallea et al., 1999) as "Coastal Scrub and Shrubland of Developed Areas."

Vegetation along the road shoulders includes salt-tolerant plants, shrubs, and other native plants that help stabilize the soil and provide minimal habitat for fauna such as birds, insects, and small reptiles. Tree removal is not expected, and no endangered species have been recorded during baseline surveys.

To comply with ESPS 6, contractors must limit clearance to the minimum required footprint and apply restoration practices post-installation. All vegetation management will follow national environmental regulations, including those under the Forestry Act (2010), and be coordinated with the Department of Environmental Planning and Protection (DEPP) where relevant. With proper implementation, residual biodiversity impacts will be negligible.

ESPS 9: Gender Equality

ESPS 9 emphasizes equitable access to project benefits and opportunities for both men and women. In the Bahamas, men traditionally dominate construction-related employment, while women bear a disproportionate share of responsibility for household water management. By applying ESPS 9, the project can actively promote women's participation in employment opportunities and ensure that contract documents include equal pay and non-discrimination provisions.

ESPS 10: Stakeholder Engagement and Information Disclosure

This standard requires transparent, inclusive, and continuous engagement with affected communities and stakeholders. For this project, ESPS 10 involves providing timely information about works, water service interruptions, and anticipated benefits; holding community meetings; distributing notices through accessible channels; and operating a functional Grievance Redress Mechanism (GRM). By implementing ESPS 10, the project ensures accountability, builds trust with communities, and creates space for local feedback to shape project delivery.

5 ENVIRONMENTAL AND SOCIAL BASELINE

5.1 INTRODUCTION

The baseline assessment identified that the Port Royal community borders a canal system lined with sporadic mangroves, which are ecologically sensitive; however, these mangrove areas are buffered by existing residential structures, effectively shielding the trenching zones and roadways from direct ecological impact.

The baseline assessment includes an overview of physical, biological, and environmental characteristics that may influence or be impacted by the construction and operation of the water infrastructure. As part of this assessment, the access road, which consists of compacted limestone and sand surfaces bordered by mixed coastal vegetation was also evaluated. This roadway forms the primary alignment for the proposed water mains installation and plays a key role in determining construction access, equipment movement, dust generation potential, and interactions with adjacent residential properties.

The social baseline assessment examines the existing demographic, infrastructural, and socioeconomic conditions within the Port Royal area of South Bimini. It focuses on patterns of settlement, community infrastructure, and access to basic services—particularly potable water—as well as local livelihoods that may be influenced by the project. The assessment also considers aspects of public health, safety, accessibility, and equity to establish a baseline for evaluating the project's potential social impacts and benefits. This baseline provides the foundation for identifying environmental and social risks and for defining appropriate mitigation and monitoring measures within the ESMP.

The area primarily comprises open land and natural vegetation, with approximately 145 residential buildings, one church, and one institutional structure, the Bimini Biological Field Station. The community is characterised by low-density residential development interspersed with landscaped properties and undeveloped parcels. Trenching activities will occur along the shoulders of single-carriageway roads within the Port Royal community, where roadway edges transition into private driveways, canal and dock access paths, and intermittently manicured yards featuring ornamental vegetation such as palm trees (Photo 1). Vegetation along the roadway is discontinuous and consists mainly of native shrubs, grasses, and maintained landscaping.

In addition to works within the Port Royal internal road network, trenching will also take place along the entrance road to the subdivision, beginning in front of Bimini Cove Resort, to facilitate connection to the existing water main that serves as the project's tie-in point. This segment of the entrance road and the adjacent frontage of the resort are therefore included within the project's Direct Area of Influence. However, the baseline assessment confirms that this activity will not affect the operations, access, or water service of Bimini Cove Resort. No service interruptions or changes to resort infrastructure are anticipated, and construction activities in this area will be limited in scope and duration.

No protected flora or fauna have been identified within the immediate project footprint, and the alignment does not intersect any formally designated critical habitats or ecologically sensitive zones. The baseline conditions indicate that potential social impacts are primarily related to temporary construction activity and access management, rather than long-term changes to land use, livelihoods, or community structure.

Photo 4. Port Royal Roadways and vegetated outlook

The project area is subject to environmental constraints that require adaptive construction approaches. Soils are primarily composed of loose sand and shell aggregate, which may reduce ground stability during excavation. The absence of engineered drainage systems contributes to localized pooling during rainfall events, with terrain variability affecting water retention in some areas. Although Port Royal has not experienced severe flood damage in recent history, Bimini as a whole sustained surge-related infrastructure impacts during Hurricane Irma (2017). These community vulnerabilities have been factored into the project's disaster risk planning, construction scheduling, and site management protocols.

Given the lack of formal pedestrian infrastructure, the project will implement temporary barriers, signage, and clearly marked walking paths to ensure the safety of residents, pedestrians, and workers during the construction phase.

In terms of social impact, the proposed works are expected to deliver substantial public health, equity, and service reliability benefits. Many households in South Bimini continue to rely on private wells, bottled water, or rainwater harvesting systems, which are often costly, inconsistent. By extending piped potable water through the Port Royal area, the project will enhance the quality, affordability, and security of water supply for residents, the church, and public institutions. Improved access to reliable water will contribute

to higher living standards, reduced household expenditure on alternative water sources, and better overall community health outcomes.

5.2 DEFINITION OF AREA OF INFLUENCE

This section defines the Direct and Indirect Areas of Influence (DAoI and IAoI) in South Bimini, specifically within the Port Royal area. These areas reflect the localized scale and environmental sensitivity of the works based on final project designs and site inspections.

5.2.1 Direct Area of Influence (DAoI)

The Direct Area of Influence (DAoI) is defined as the immediate zone where direct environmental and social impacts are expected to occur during construction and operation of the water mains. It refers to the spaces, households, institutions and community activities that are located immediately along or adjacent to the project footprint that may experience direct, immediate, and measurable social and environmental effects resulting from construction or operational activities. This includes the physical footprint of excavation, staging areas, pipe installation, excavated trench material, and access for machinery and workers. It also includes people and properties exposed to temporary disruptions such as changes in access, noise, dust, utility interruptions, work-crew presence, and short-term traffic modifications.

With respect to social impacts, the direct area encompasses those residents, community facilities, and local institutions whose daily routines, mobility, and interaction with public services may be directly altered by the project's physical works.

Given the residential layout of Port Royal, with narrow single-lane roads, canal-side access paths, and landscaped or naturally vegetated buffers, the environmental DAoI is conservatively set at 6–8 meters from the trench centerline, which aligns with the edge of the paved road and adjacent unpaved shoulders. This captures all areas subject to excavation, compaction, and physical disturbance.

- For Port Royal, the DAoI includes the unpaved roadway leading up to the community and throughout the community, extending to the vegetated roadside where trenching, excavated trench material, and temporary access routes will occur.

The defined DAoI also includes:

- The trench alignment and immediate buffer for equipment maneuvering and material placement.
- Temporary construction zones used for short-term activities such as trench material.
- The unpaved roadway leading up to the community and throughout the community, extending to the vegetated roadside where trenching, excavated trench material, and temporary access routes will occur.
- Sections of the roadway where unpaved surfaces may be temporarily altered during works, including localized reinstatement areas.
- Residences, community facilities, and institutions located immediately adjacent to the alignment, including households that may experience direct short-term disturbances such as noise, dust, or temporary access changes.
- Paths and informal pedestrian routes commonly used by residents, especially schoolchildren, elderly persons, and pedestrians without vehicles that may be temporarily affected by trenching or equipment movement.
- Driveways, property entrances, and yard spaces that require temporary coordination with residents for access, material placement, or connection works.

- Sections of the roadway that support daily community services, including waste collection, deliveries, school transport, and emergency access, which may be directly influenced by construction activities.
- Zones with vulnerable or mobility-restricted individuals whose daily routines may be more directly impacted by temporary access limitations or construction-related obstacles.

Within this zone, the following activities will occur**:**

- Trenching and installation of 4- and 6-inch PVC water mains;
- Placement of service laterals;
- Temporary excavated trench material and backfill preparation;
- Movement of materials and machinery.
- Due to the proximity of driveways, pedestrian paths, and canal access points, this DAoI also encompasses key residential interfaces where safety measures and communication protocols will be prioritized.
- Roadway reinstatement and temporary surface disturbance resulting from trenching across semi-paved and unpaved segments of the access road leading up to the community.

5.2.2 Indirect Area of Influence (IAoI)

The environmental Indirect Area of Influence (IAoI) captures the broader area that may experience temporary or secondary impacts during the construction phase. For the Port Royal works, the IAoI extends approximately 20 meters from the trench alignment, encompassing adjacent properties, yard spaces, roadside vegetation, and canal-facing lots. These effects may arise through changes in traffic flow, community connectivity, service reliability, economic activity, or the use of shared public spaces and infrastructure.

For social considerations, the indirect area includes individuals, businesses, and institutions that rely on the same transportation routes, community services, or utility networks as those in the direct area, and whose routines or social dynamics may be influenced indirectly by project-related activities or long-term improvements. Although the Bimini Cove Resort is located within the wider vicinity of the project area, its location is significantly removed from the defined scope of works. Project activities will not extend into, intersect with, or impose any operational, economic, or infrastructural impacts on the Resort, including its water distribution network or related utilities. Therefore, while it is recognized as a neighboring facility on the island, Bimini Cove Resort remains outside the Project's Indirect Area of Influence.

Within the IAoI, potential temporary impacts may include:

- Intermittent noise and dust generation during excavation and machinery operation;
- Visual disturbances related to construction signage, equipment staging, and road reinstatement;
- Minor delays or restricted access to driveways and paths during active works.
- This also includes portions of the access road leading to the community where indirect effects such as temporary narrowing of the roadway, construction-related presence of machinery, or minor dust dispersion may occur, although no meaningful traffic delays are anticipated due to the low volume of vehicular and golf cart activity in South Bimini and Port Royal.

While these impacts are short-term and localized, the presence of seasonal residents and waterfront properties requires a heightened level of community engagement and phased scheduling to avoid peak occupancy periods where feasible.

There are no known critical habitats, protected areas, or formally recognized sensitive ecosystems within the defined DAoI or IAoI in Port Royal. However, environmental safeguards and risk mitigation measures will be implemented to minimize residual effects and maintain community wellbeing throughout the construction period.

5.3 SITE CONDITIONS ANALYSIS

Port Royal in South Bimini is a low-density, canal-based residential community characterized by narrow single-lane roads, private dock access, and a mix of seasonal and permanent homes. The area is not traditionally paved but features compacted limestone and sand roads that transition directly into residential driveways and access paths. These roads form the primary access corridor for the planned water mains alignment and fall fully within the direct area of influence. While some yards are landscaped with ornamental trees and lawn areas, others retain native vegetation along the roadside. The direct area of influence for the planned water mains runs adjacent to these mixed-use verges, which serve as buffers between the roadway and private properties. Port Royal's layout offers a linear and accessible alignment for trenching, though space is constrained, requiring careful planning to minimize disturbance. Road conditions vary along the alignment, with portions that are semi-paved or compacted and others showing surface wear due to periodic inundation and routine daily use. These characteristics will influence construction sequencing, trench stability, and reinstatement requirements.

Site visits were conducted on July 15 and 16, 2025, to assess the physical and biological characteristics of the Port Royal community in South Bimini. The field studies aimed to document the local topography, geology, soil conditions, surface hydrology, vegetation composition, and fauna presence within the direct and indirect area of influence. Observations of the access road leading up to the community were also recorded, including road width, surface composition, drainage patterns, and proximity to residential lots, all of which inform equipment movement and trench alignment feasibility. Vegetation types were mapped and verified on-site, guided by the classification framework established by Areces et al. (1999), while plant species identification followed the taxonomy of Correll and Correll (1982).[1] [2]

During the survey, the presence and relative abundance of vascular plant species were documented, with specific attention to flora listed under the Protected Trees Order (2021) and invasive species flagged in the National Invasive Species Strategy for The Bahamas (2013). This baseline assessment supports the evaluation of potential environmental impacts associated with trenching and water mains installation and informs the mitigation strategies outlined in the ESMP. The condition and orientation of the roadway were also noted as key physical features influencing construction access, staging areas, and resident/visitor interface during the works.

[1] Areces-Mallea, A. E., Weakley, A. S., Li, X., Sayre, R. G., Parrish, J. D., Tipton, C. V., & Boucher, T. (1999). A Guide to Caribbean Vegetation Types: Preliminary Classification System and Descriptions. The Nature Conservancy.

[2] Correll, D., & Correll, H. (1982). The Flora of the Bahama Archipelago: Including Turks & Caicos Islands. J. Cramer.

5.4 DIRECT AREA OF INFLUENCE (DAOI) BASELINE

5.4.1 Topography and Erosion Potential

The topography of the Port Royal corridor and the access road to Port Royal in South Bimini is moderately variable, with a mix of slightly elevated lots, gently sloping yards, and lower-lying compacted roadway areas. The roads are unpaved but well-maintained, comprised of compacted sand and shell aggregate that accommodates seasonal use by vehicles, golf carts, and pedestrians (Photo 5). While the general elevation does not exceed 3 meters above sea level, some residential lots are built on raised pads or stilts, reducing direct exposure to surface water pooling.

Photo 5. Port Royal topography

Unlike areas with engineered slopes or stormwater channels, Port Royal lacks formal drainage infrastructure, and surface water pooling can occur after heavy rainfall, particularly in depressions and flat sections of the corridor (Photo 6). However, widespread or prolonged flooding is rare. The surrounding terrain features a mix of landscaped residential yards and open green spaces, with both ornamental and native vegetation providing natural buffers that reduce runoff and limit sediment transport. Observed plant species include Sea Grape (*Coccoloba uvifera*), Coconut Palm (*Cocos nucifera*), and Casuarina (*Casuarina equisetifolia*), the latter of which is an invasive species in The Bahamas. Additionally, fruit-bearing trees such as Mango (*Mangifera indica*) are present in private lots, alongside a variety of tropical shrubs, grasses, and decorative palms. This varied vegetation cover contributes to informal erosion control and enhances visual quality along the corridor.

Photo 6. Port Royal roadway, showing water logging and vegetative buffers

The risk of erosion is considered low due to the absence of steep gradients and the coarse-textured soils, which minimize sediment displacement. However, localized waterlogging and soft ground may affect trenching timelines, especially during or shortly after rainfall. Construction schedules and backfilling methods should therefore remain adaptive to site conditions. No formal roadside swales or culverts exist, and mitigation measures must emphasize erosion control through good housekeeping, compacted backfill, and material stabilization.

Vegetation disturbance will be avoided where possible and managed in accordance with the Forestry Act (2010) and DEPP guidance.

Photo 7. Access Road leading up to the community showing vegetative buffers

The Port Royal access road lies on flat to gently sloping coastal terrain, typical of South Bimini's low-lying limestone platform. Elevations across the road appear uniform with no significant grade changes or visible depressions. The flat topography minimizes large-scale erosion; however, the lack of engineered draining and the predominance of loose, compacted sad and marl surfaces increased the likelihood of surface washouts after heavv rainfall, localized rutting in areas where vehicles routinely pass, and minor sediment displacement along unvegetated edges.

During site visits, it was observed where the road widens and where tire tracks create shallow depressions in the roadway, indicating light erosion from wind, vehicle movement, and periodic inundation. Although erosion risk is low in scale, the unpaved surface is susceptible to softening and temporary instability during wet conditions, requiring targeted mitigation during trenching works.

5.4.2 Geology and Soil Profile

The geology of Port Royal access road and community in South Bimini is primarily composed of Quaternary-aged carbonate limestone bedrock, typical of the Bahamian archipelago. Overlying this bedrock is a thin surface layer of unconsolidated sandy soils mixed with crushed coral, shell fragments, and occasional rocky substrate. These soils are light-colored, loosely compacted, and highly porous, offering low structural cohesion unless artificially stabilized through compaction or reinforcement.[3]

Field observations from the July 2025 site visit confirmed that road shoulders and unpaved carriageways throughout the Port Royal community consist of white, fine-to-medium grain sand interspersed with exposed rock fragments and shell-based aggregate. These conditions are clearly visible in the site photos (Photo 5 and Photo 6), where several road segments display shallow soil profiles, minimal vegetative

[3] Government of The Bahamas (2024). Third National Communication of The Commonwealth of The Bahamas to the United Nations Framework Convention on Climate Change (UNFCCC). Nassau, The Bahamas. https://unfccc.int/sites/default/files/resource/2024%20The%20Bahamas%20TNC%20to%20the%20UNFCCC.pdf

ground cover, and visible material transitions between natural sand and compacted road base. Along the primary access road, these materials have been shaped into a loosely consolidated driving surface with areas of rutting and surface wear, reflecting routine vehicle use and the absence of form grading or engineered stabilization. The access road's soil composition, dominiated by calcareous and marl, contributes to its softness when wet, increased dust generation during dry periods, and susceptibility to minor erosion along the exposed margins.

Due to the fragile nature of this substrate, trenching must be carefully sequenced, with immediate backfilling and compaction to prevent trench wall slippage or collapse. The lack of engineered slopes and formal drainage infrastructure increases the risk of localized ponding after rainfall, which can soften soil bearing capacity and delay excavation or pipe-laying activities if not actively managed.

No signs of soil contamination, buried refuse, or anthropogenic fill material were observed within the project footprint. However, scattered natural and ornamental vegetation and tropical shrubs, line sections of the roadway and must be protected from unnecessary root disturbance during trenching. A site-specific Soil and Vegetation Management Plan will guide all excavation activities to ensure environmental protection, slope stability, and construction safety.

5.4.3 Hydrology

The hydrological profile of Port Royal is defined by the area's coastal geology, porous sandy soils, and absence of engineered stormwater infrastructure. The community consists of unsealed limestone and sand-based roadways, with some sections slightly elevated or gently sloped. However, the general terrain is flat to mildly undulating, contributing to localized water pooling during and after moderate rainfall events.

Unlike other parts of the island, Port Royal does not intersect any mapped blue holes or wetland systems. However, the community lies adjacent to a canal-based waterfront system, which provides direct access to the sea but is not hydrologically connected to the roadways due to the buffering effect of residential structures, landscaped yards, and perimeter vegetation. As such, stormwater runoff from the roadways does not flow directly into the canal but instead infiltrates slowly into the sandy and shell-based soil or is retained in low-lying depressions.

According to national hydrogeological assessments, including The Bahamas' Third National Communication to the UNFCCC (2024), the archipelago lacks perennial rivers and instead depends entirely on direct rainfall infiltration as the sole means of freshwater recharge. The freshwater resources occur as thin, lens-shaped bodies that float above saline groundwater, typically situated 0.3 to 1.5 meters below the surface in inland areas. These lenses are highly susceptible to salinization, particularly due to sea level rise, tidal movement, and surface contamination from anthropogenic activities.

During site visits, surface water accumulation was observed in flatter segments and driveways where drainage is impeded by poor soil permeability, compacted surfaces, and a lack of natural swales or culverts. These conditions contribute to temporary waterlogging and may delay construction activities or equipment movement if unaddressed. Despite these challenges, widespread flooding is uncommon, and pooled water typically dissipates within 24–48 hours unless exacerbated by prolonged rainfall. Seasonal storm events, particularly during the Atlantic hurricane season (June–November), may temporarily elevate the water table to above-ground levels, turning portions of the corridor into ephemeral wetland

areas.[4] Given these characteristics, construction logistics must account for intermittent surface pooling, low soil infiltration rates, and the need for careful material staging to avoid compaction or disruption in saturated zones. No formal stormwater catchment areas or drainage features are present within the alignment footprint.

National climate change projections underscore the long-term fragility of The Bahamas' freshwater regime. With declining rainfall, increasing drought frequency, and elevated temperatures, groundwater recharge is expected to decrease. Meanwhile, the risk of saltwater intrusion and pollution from surface runoff is rising. These factors are compounded in smaller islands like Bimini, where freshwater lenses are thinner and more vulnerable to over-abstraction and contamination.

As summarized in the National Communication and previous water sector assessments, Bimini's freshwater lens is among the smallest in The Bahamas, covering only 395 acres and a lens area size of 0.06 (Table 1). This limitation reinforces the importance of climate-resilient water infrastructure, such as the Airport Road mains extension, to reduce dependency on vulnerable private wells and ensure potable water access through centralized, treated supply systems.

In response, this project incorporates environmental safeguards to manage hydrological exposure during construction. These include staged excavation, weather-responsive scheduling, protective backfill selection, and erosion-resistant materials. While no significant operational hydrological risks are anticipated post-installation, pre-emptive planning during construction is essential to avoid exposure-related setbacks or degradation of the surrounding environment.

Table 1. Freshwater Resources of The Bahamas 2007

Island	Size (Acres)	Freshwater Lens (Acres)	Lens/Area Size
Abaco	415,360	116,280	0.28
Acklins	96,000	15,783	0.16
Andros	1,472,000	338,585	0.23
Bimini	**7,040**	**395**	**0.06**
Cat Island	96,000	14,774	0.15
Crooked Is.	58,900	5,923	0.10
Eleuthera	128,000	16,599	0.13
Exumas	71,680	6,586	0.09
Grand Bahama	339,200	147,884	0.44
Gr. Inagua	383,360	3,571	0.01
Long Island	147,200	9,301	0.06
Mayaguana	70,400	--	0.03
New Providence	51,200	2,340	0.34
Totals	**3,336,340**	**678,021**	**2.08**

[4]Government of The Bahamas (2024). Third National Communication of The Commonwealth of The Bahamas to the United Nations Framework Convention on Climate Change (UNFCCC). Nassau, The Bahamas. https://unfccc.int/sites/default/files/resource/2024%20The%20Bahamas%20TNC%20to%20the%20UNFCCC.pdf

5.4.4 Hazards, Vulnerability, and Island Risks

The Commonwealth of The Bahamas is one of the most hazard-prone countries in the Atlantic region, primarily due to its geographical characteristics and exposure to multiple natural hazards. As a flat, low-lying archipelago of over 700 islands and cays, The Bahamas faces frequent and intensifying threats from tropical cyclones, storm surges, coastal flooding, and climate-induced extremes. The national risk profile, as outlined in recent assessments by the Pacific Disaster Center and ThinkHazard, identifies hurricanes and tropical storms as the most significant hazards, followed closely by storm surge, coastal flooding, high winds, and rain-induced erosion. While seismic risk is minimal, the combination of climate-related hazards presents ongoing challenges for infrastructure, public services, and community resilience.

Historically, The Bahamas has experienced numerous severe storm events with widespread impacts. Hurricane Matthew in 2016 caused major flooding and wind damage in New Providence and Grand Bahama. In 2017, Hurricane Irma delivered widespread wave action and flooding to several islands including Bimini. This was followed by Hurricane Dorian in 2019, a catastrophic Category 5 storm that devastated Abaco and Grand Bahama and exposed significant gaps in national preparedness, response capacity, and infrastructure resilience. Together, these events underscore the need for robust, climate-resilient design in all infrastructure projects, particularly those serving the Family Islands.

From a climate change perspective, The Bahamas faces a range of acute and chronic environmental threats that disproportionately affect small island nations. As a low-lying archipelago, the country is particularly vulnerable to slow-onset climate hazards such as sea level rise, saltwater intrusion into freshwater reserves, and shifts in rainfall patterns that contribute to extreme precipitation events. These phenomena threaten critical infrastructure, reduce groundwater quality, and undermine the reliability of potable water supply, particularly in remote Family Island communities like Bimini, where infrastructure is limited and highly exposed. Rising sea levels further increase the likelihood of saltwater intrusion into freshwater lenses, compounding long-term water insecurity. Intensifying rainfall events also increase runoff and erosion along unpaved or poorly drained corridors, such as Airport Road, posing operational challenges for buried water infrastructure.

Given these risks, it is imperative that all infrastructure investments, especially in climate-vulnerable zones, undergo site-specific climate and disaster risk assessments that inform resilient design. This approach aligns with the IDB's ESPS and the strategic priorities outlined in The Bahamas' National Climate Change Adaptation Policy, which calls for enhanced planning and design of water supply systems to reduce climate risks, increase adaptive capacity, and promote long-term sustainability. The policy further emphasizes the importance of integrating adaptation considerations into all development planning, including efforts to safeguard water infrastructure, diversify freshwater sources, and ensure equitable access in the face of growing environmental pressures.

5.4.4.1 Island-Specific Profile: Bimini

Bimini is among the smallest and most exposed islands in The Bahamas, situated approximately 50 miles east of Florida. Its geography, characterized by a narrow landmass, low elevation, and lack of natural high ground, makes it especially susceptible to storm surge, flooding, and erosion. Much of Bimini lies less than one meter above sea level, with limited infrastructure to divert floodwaters or resist wind-driven hazards.[5] These physical vulnerabilities are compounded by long-term climate risks, including sea-level rise and saltwater intrusion, which pose growing threats to water security and community infrastructure.

[5] Pacific Disaster Center (PDC). (2019). *The Bahamas: Island Risk Profiles- Multi-Hazard Exposure and Vulnerability Assessment*. State of Hawaii, USA: Pacific Disaster Center.

Over the past two decades, Bimini has been impacted by several notable hurricanes, each highlighting different aspects of the island's vulnerability. In 2005, Hurricane Wilma (Category 3) caused severe beach erosion and infrastructure damage.[6] Most significantly, Hurricane Irma (Category 5) in 2017 delivered widespread coastal flooding, storm surge, and damage to coastal roadways. Irma also prompted the evacuation of 365 persons from Bimini specifically, along with other islands in the southern Bahamas.[7] Although Bimini was spared the direct impact of Hurricane Dorian in 2019, the event catalyzed national-level reassessments of climate and disaster risk across all islands, reinforcing the urgency of resilience-building efforts even in areas not traditionally considered high-risk.

Bimini experiences a tropical marine climate moderated by easterly trade winds, with warm, humid conditions prevailing year-round. Seasonal rainfall occurs primarily between May and October, coinciding with the Atlantic hurricane season.[8] Annual precipitation exceeds 1,200 mm and is often delivered in short, intense bursts that lead to localized flooding. This is especially true along compacted, unpaved roadways such as Airport Road, where poor drainage and water pooling are persistent concerns.

The island's hazard exposure is well-documented in global and regional assessments. According to Think Hazard, there is a greater than 20% chance that Bimini will experience damaging cyclone-force winds within the next decade, underscoring the importance of integrating disaster-resilient design even for inland infrastructure like water mains. [9] Data from the Pacific Disaster Center (PDC) further reinforces this risk profile. The entire population and capital assets of Bimini are considered exposed to tropical cyclone winds, with 15.8% vulnerable to storm surge. While exposure to flooding, wildfires, and landslides is minimal, sea level rise remains a key concern, with projections indicating that even small increases could affect vital infrastructure and habitability. These risks contribute to Bimini's multi-hazard risk score of 0.287, one of the lowest among 17 Bahamian islands, but do not negate the need for site-level resilience measures.[10]

Despite the relatively low multi-hazard score, Bimini ranks 10th of 17 islands in overall vulnerability, driven by socio-economic and infrastructure-related stressors. Approximately 61% of the population lacks access to private transportation, and 22.5% live in crowded housing, which complicates emergency response and evacuation logistics. Environmental vulnerability is also elevated, with 100% of coral reefs exposed to local and thermal stress and limited designated conservation areas.[11] Although access to piped water (97.1%) and electricity (94.9%) is high, Bimini ranks 13th in Island Capacity, reflecting deficiencies in healthcare services, emergency response infrastructure, and economic resilience.[12]

Water infrastructure in Port Royal, South Bimini, is essential to improving living conditions and strengthening resilience in a small, coastal settlement that experiences seasonal population increases and limited freshwater resources. Existing physical, social, and environmental conditions underscore the

---

[6] Neely, W. (2019). The greatest and deadliest hurricanes to impact The Bahamas. URLink Print & Media, LLC.USA.

[7] The Tribune. (2017, September 8). PM warns: Stay indoors and heed all warnings. The Tribune 242. https://www.tribune242.com/news/2017/sep/08/pm-warns-stay-indoors-and-heed-all-warnings/

[8] Government of The Bahamas (2024). Third National Communication to the UNFCCC

[9] Think Hazard (n.d.). *Bahamas-Natural hazard risk overview*. Global Facility for Disaster Reduction and Recovery (GFDRR). Think Hazard - The Bahamas

[10] Pacific Disaster Center (PDC). (2019). *The Bahamas: Island Risk Profiles- Multi-Hazard Exposure and Vulnerability Assessment*. State of Hawaii, USA: Pacific Disaster Center.

[11] Pacific Disaster Center (PDC). (2019). *The Bahamas: Island Risk Profiles- Multi-Hazard Exposure and Vulnerability Assessment*. State of Hawaii, USA: Pacific Disaster Center.

[12] Pacific Disaster Center (PDC). (2019). *The Bahamas: Island Risk Profiles- Multi-Hazard Exposure and Vulnerability Assessment*. State of Hawaii, USA: Pacific Disaster Center.

community's vulnerability to climate-related hazards and the importance of carefully planned, climate-resilient infrastructure. For this project, applying a comprehensive disaster and climate risk lens is critical to safeguard public investment, maintain reliable service delivery, and ensure the long-term sustainability and functionality of water infrastructure under evolving climate conditions.

5.4.5 Biotic Environmental Baseline

5.4.5.1 Flora

Vegetation along the Port Royal alignment reflects a mix of disturbed coastal vegetation, ornamental landscaping, and native plant communities typical of developed canal-front residential zones in The Bahamas. The immediate trenching zone is bordered by sandy verges, residential driveways, manicured lawns, and occasional clusters of native shrubbery. Vegetation is sporadic rather than continuous and tends to be shaped by individual lot landscaping preferences. Along the access road leading up the community, vegetation becomes denser and more naturalized, with stretches of roadside shrubland, overhanging tree canopies, and unmanaged coastal vegetation bordering the unpaved road surface. These areas show typical coastal-edge assemblages adapted to sandy, calcaerous soils and intermittent disturbance from vehicle movement.

Field observations from the July 2025 site visit identified the following common and/or dominant species within or near the DAoI:

- Sea Grape (*Coccoloba uvifera*): native, legally protected under the Protected Trees Order (2021)
- Coconut Palm (*Cocos nucifera*): widely planted ornamental species
- Australian Pine (*Casuarina equisetifolia*): invasive tree species per National Invasive Species Strategy (2013)
- Mango Tree (*Mangifera indica*): non-native fruit tree seen in some yards
- Florida Thatch Palm (*Thrinax radiata*): native, occasionally used in residential landscaping
- Bougainvillea spp. and other decorative shrubs, found throughout maintained parcels
- Buttonwood (Conocarpus erectus) and mixed coastal shrubs observed along the road shoulder, particularly in sections with minimal residential clearing
- Low-growing grasses and herbaceous groundcover typical of disturbed roadside habitats

Importantly, healthy mangrove vegetation is present along segments of the canal buffer zone, including Red Mangrove (*Rhizophora mangle*) and Black Mangrove (*Avicennia germinans*) shrubs, within the IAoI. These mangroves are outside of the construction footprint but contribute to the ecological character and resilience of the Port Royal area. While not part of the trenching zone, their presence reinforces the importance of managing construction runoff and material storage to avoid indirect impacts on canal-side vegetation.

The roadside areas along the access road also host a mix of native and invasive species, with Casuarina stands forming shaded coordiors in several locations and dense shrub growth providing natural buffers between the roadway and adjacent residential parcels. These habitats, although modified, support typical small fauna and contribute to dust suppression and soil stabilization.

No vegetation clearance is anticipated beyond the narrow excavation path. The works are confined to previously disturbed margins, and no protected trees are expected to be removed. If incidental pruning or relocation becomes necessary, DEPP and the Forestry Unit will be consulted, and restoration measures, using native, salt-tolerant species, will follow backfilling and surface reinstatement in line with national regulations.

5.4.5.2 Fauna

The faunal composition of Port Royal corridor includes common terrestrial and low-lying coastal species known throughout Bimini. Within the direct area of influence, typical fauna includes:

- *Leiocephalus carinatus* (Northern Curly-tailed Lizard)
- *Zenaida aurita* (Zenaida Dove)
- *Mimus polyglottos* (Northern Mockingbird)
- *Anolis sagrei* (Brown Anole)
- Rodents (e.g., *Rattus norvegicus*) and feral cats
- Insects and arthropods including ants, wasps, butterflies, and flies
- Land crabs and other small invertebrates commonly found along vegetated road edges

No evidence of protected terrestrial species, nesting grounds, burrows, or critical habitat was observed during the July 2025 field assessment. The area holds low to moderate ecological value, as fauna tend to be transient and well adapted to anthropogenic disturbance. Species noted are neither endemic nor restricted to the works corridor, and the alignment does not intersect any mapped wildlife corridors.

Faunal presence along the access road leading up to the community is consistent with lightly disturbed residential environments, where small reptiles, insects, birds and occasional feral mammals occupy roadside vegetation. The absence of freshwater bodies and the narrow, unpaved nature of the road limit overall fauna diversity, though shaded areas with denser vegetation provide microhabitats for lizards, small birds, and insects.

Although minimal impact is expected, fauna presence in the indirect area of influence, particularly within the adjacent scrub habitat may lead to occasional encounters with wildlife. Chance encounters during trenching will be addressed through pre-clearance inspections, with any significant findings reported to WSC and DEPP.

No direct impact to aquatic fauna is expected, as the trenching zone is inland and does not intersect coastal wetlands or canal waterways. Reference is made to *Smith et al. (2014)* who documented aquatic biodiversity in North Bimini's coastal lagoon system, which lies well outside the zone of influence of this project.[13]

5.4.5.3 Protected Areas and Biodiversity Sensitivity

The direct and indirect areas of influence (DAoI/IAoI) of the Port Royal works alignment do not intersect any formally designated Protected Areas, Key Biodiversity Areas (KBA), or Important Bird Areas (IBA). Spatial overlays and national datasets from the Bahamas Protected Areas Fund (BPAF) confirm the absence of legally protected conservation zones within or immediately adjacent to the pipeline corridor. No sensitive ecological zones, wildlife sanctuaries, or species-specific conservation areas are present along the access road leading up to the community or the adjacent residential community, reflecting the already modified character of the area.

However, the Port Royal community lies immediately adjacent to the South Bimini lemon shark nursery, a recognized ecological feature with significant biodiversity value (Figure 1). According to Knowles et al. (2024), this nursery functions as a critical juvenile habitat for Lemon Sharks (*Negaprion brevirostris*), and it is one of the most studied coastal shark nurseries in the Caribbean. The nursery is connected to a broader system of mangroves, seagrass beds, and shallow coastal flats, which together support a range of

[13] Smith, M.L., Hargrove, J., Harborne, A.R., & Pitt, J. (2014). Aquatic biodiversity of a threatened coastal lagoon at Bimini, Bahamas. BioRisk, 9, 1–18. https://doi.org/10.1007/s11852-012-0211-6

aquatic biodiversity[14] [15] Although these habitats are outside DAoI/IAoI, their presence elevates regional ecological sensitivity and reinforces the importance of preventing construction-related runoff or sedimentation from reaching canal or coastal waters.

Although the project alignment in Port Royal is located inland along existing residential roads and separated from the canal system by vegetation and private lots, its proximity to interconnected waterways and coastal habitats underscores the importance of preventing indirect ecological disturbance. Previous development activities in South Bimini, including canal excavation, residential expansion, and associated vegetation clearance, have already altered natural drainage patterns and contributed to localized sedimentation within canal systems.[16] While the full extent of previous impacts remains unquantified, these findings elevate the sensitivity of the Port Royal area and underscore the need for cautious planning, especially around vegetation interactions, material staging, and runoff management.

Vegetation along the canal edge within Port Royal includes patches of healthy mangroves, which provide shoreline stabilization and ecological value. No critical habitats, coral reef zones, or mapped wildlife corridors fall within the defined DAoI. The flora and fauna present are typical of residential, human-modified landscapes and are expected to be resilient to localized construction disturbance, especially with the implementation of vegetative buffer practices and construction-phase safeguards. The unpaved access road and nearby roadside vegetation do not support any known protected species or priority habitats; however, these areas function as minor ecological buffers that help reduce dust, stabilize soils, and filter runoff before it reaches any waterway.

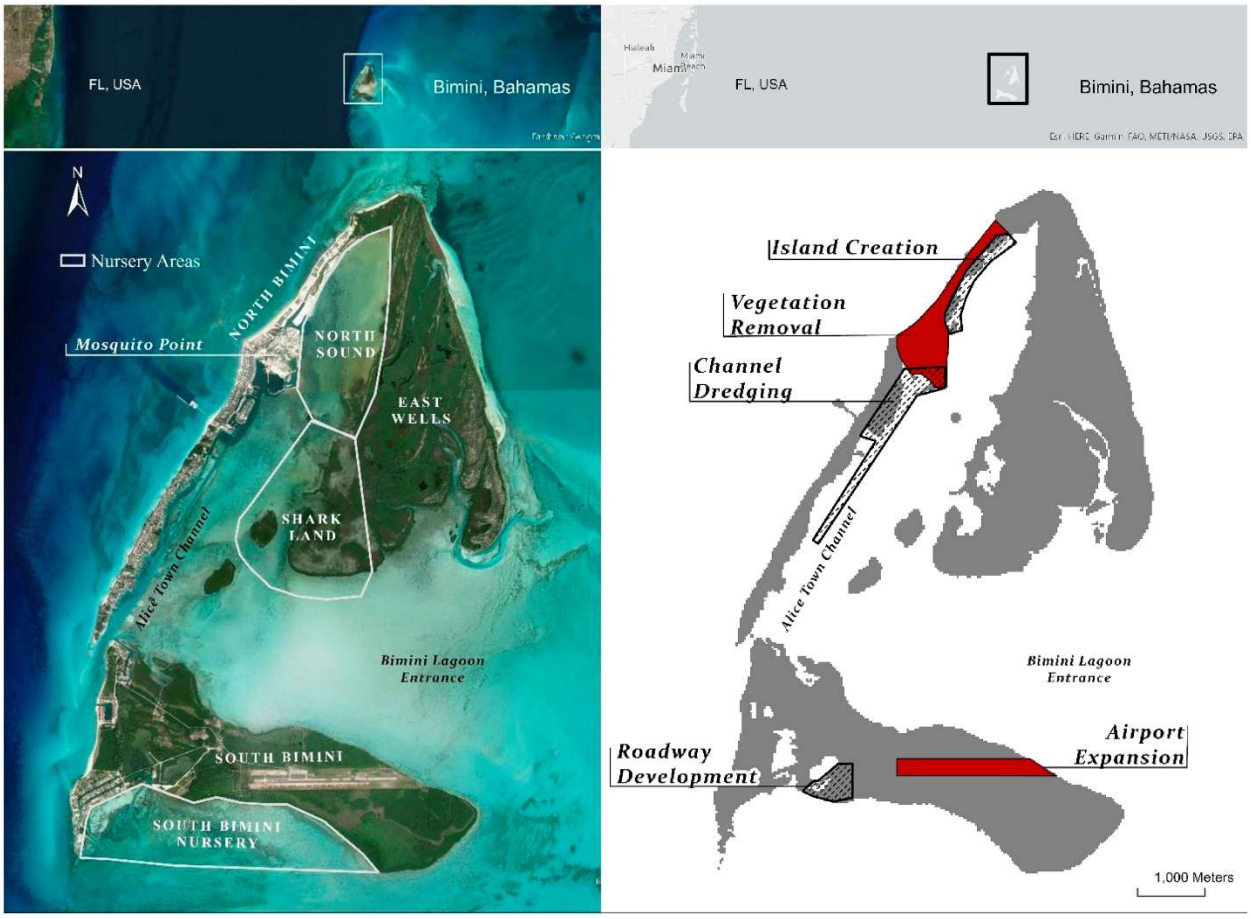
A pre-clearing ecological walkthrough, combined with a chance-find protocol and avoidance of canal-edge vegetation, will guide on-site environmental sensitivity screening. While no significant biodiversity risks are anticipated, the project will adopt a precautionary approach due to its proximity to ecologically significant coastal systems. Mitigation measures will prioritize erosion control, restricted material stockpiling, and careful management of trenching activities along the access road to ensure that no indirect impacts occur.

[14] Emily C. Cormier, Emmanuel Devred, Kristen L. Wilson, Matthew J. Smukall, Mariana M.P.B. Fuentes, and Heike K. Lotze. 2025. Analysis of two decades of Landsat satellite images reveals long-term changes in aquatic and terrestrial vegetation in Bimini, The Bahamas with coastal development. FACETS. 10: 1-18. https://doi.org/10.1139/facets-2024-0020

[15] Emily C. Cormier, Emmanuel Devred, Kristen L. Wilson, Matthew J. Smukall, Mariana M.P.B. Fuentes, and Heike K. Lotze. 2025. Analysis of two decades of Landsat satellite images reveals long-term changes in aquatic and terrestrial vegetation in Bimini, The Bahamas with coastal development. FACETS. 10: 1-18. https://doi.org/10.1139/facets-2024-0020

[16] Emily C. Cormier, Emmanuel Devred, Kristen L. Wilson, Matthew J. Smukall, Mariana M.P.B. Fuentes, and Heike K. Lotze. 2025. Analysis of two decades of Landsat satellite images reveals long-term changes in aquatic and terrestrial vegetation in Bimini, The Bahamas with coastal development. FACETS. 10: 1-18. https://doi.org/10.1139/facets-2024-0020

Figure 1. A 2020 true-color satellite image of Bimini, highlighting three major lemon shark nursery areas: North Sound, Shark Land and South Bimini, as well as major island areas: North Bimini, East Wells, and South Bimini. The South Bimini Nursery boarders the Port Royal Community in South Bimini.[17]



5.4.6 Summary of Environmental Baseline (Port Royal, South Bimini)

The Port Royal community in South Bimini is characterized by low-lying coastal terrain, sandy and rocky soils, and naturally vegetated road shoulders that provide limited but important ecological functions. Field observations indicate that the project alignment follows existing residential roadways and previously disturbed areas, including the unpaved access road leading up to the community that forms the primary cooridor for trenching and construction access. No wetlands, mangroves, or formally protected habitats intersecting the direct area of influence. Vegetation consists primarily of native coastal shrubs, grasses, and small trees, interspersed with ornamental species planted along residential lots. While no sensitive or endangered flora were identified within the direct area of influence, select native species provide habitat value and contribute to shoreline stabilization.

Faunal presence in Port Royal is consistent with common, non-threatened coastal and residential species, such as small reptiles, birds, and invertebrates adapted to human-modified environments. The access road leading up to the community and its vegetated margins support typical roadside fauna but do not contain any critical wildlife features or sensitive ecological zones. No evidence of nesting sites, migratory

[17] Emily C. Cormier, Emmanuel Devred, Kristen L. Wilson, Matthew J. Smukall, Mariana M.P.B. Fuentes, and Heike K. Lotze. 2025. Analysis of two decades of Landsat satellite images reveals long-term changes in aquatic and terrestrial vegetation in Bimini, The Bahamas with coastal development. FACETS. 10: 1-18. https://doi.org/10.1139/facets-2024-0020

pathways, or critical habitats was recorded within or adjacent to the alignment. The community's climate and hydrological conditions reflect Bimini's broader exposure to storm surge, saltwater intrusion, and seasonal flooding, compounded by the absence of formal drainage infrastructure and the area's proximity to the canal network.

These environmental conditions emphasize the need for site-specific safeguards during construction, particularly in managing runoff, preventing erosion, and minimizing vegetation disturbance. Special consideration will also be required along the access road leading up to the community, where loose calcareous soils, limited drainage, and variable vegetation cover may influence trench stability and equipment movement. Post-construction site restoration and good housekeeping practices will be essential to maintain local ecological balance and support the long-term resilience of the Port Royal environment.

6 BASELINE SOCIAL CONDITIONS

Social conditions across The Bahamas reveal a contrast between urbanized areas such as New Providence, where infrastructure and public services are more concentrated, and the Family Islands, where service gaps persist. In Bimini, access to potable water remains uneven, with many households still dependent on private wells, rainwater collection, bottled water, or tanker services. This baseline provides an overview of key social indicators for Bimini and provides insights into the benefits of Component 3 to the local community.

6.1 DEMOGRAPHIC PROFILE OF BIMINI

Bimini remains one of the smallest island communities in The Bahamas in terms of absolute population but ranks among the most densely populated after New Providence. According to the 2022 Census, Bimini had a total population of 2,361 residents, comprising 1,332 males and 1,029 females (Table 2 and Table 3).[18] This reflects a continued population share of approximately 0.6% of the national total, a proportion that has remained stable since 2000.

Table 2. 2022 Population Data for New Providence, Grand Bahama and Bimini

	2000	% of Total	2010	% of Total	2022	% of Total
All Bahamas	**303,611**		**351,461**		**398,165**	
New Providence	210,832	69%	246,329	70%	296,732	75%
Grand Bahama	46,994	15%	51,368	15%	46,740	12%
Bimini	**1,717**	**0.6%**	**1,988**	**0.6%**	**2,361**	**0.6%**

Table 3. 2022 Population by Sex for New Providence, Grand Bahama, and Bimini

	2000		2010		2022	
	Male	Female	Male	Female	Male	Female
All Bahamas	**147,715**	**155,896**	**170,257**	**181,204**	**191,667**	**206,498**
New Providence	101,558	109,274	117,909	128,420	141,337	155,395
Grand Bahama	23,024	23,970	24,996	26,372	22,361	24,379
Bimini	**886**	**831**	**1,063**	**925**	**1,332**	**1,029**

The population distribution by gender has shown a consistently higher number of males than females in Bimini over the last three census periods. The sex ratio increased from 114.92 males per 100 females in 2010 to 129.45 in 2022, significantly higher than the national average of 92.86.[19] This gender imbalance

[18] Bahamas National Statistical Institute. (2022). 2022 Census of population and housing: Official census results and data highlights summary. Nassau, The Bahamas. 2022-Census-Report-1st-Release-12-February-2025-FINAL-20250526040559.pdf

[19] Bahamas National Statistical Institute. (2022). 2022 Census of population and housing: Official census results and data highlights summary. Nassau, The Bahamas. 2022-Census-Report-1st-Release-12-February-2025-FINAL-20250526040559.pdf

may be influenced by employment patterns related to tourism, fisheries, and construction, sectors that traditionally attract more male labor.

6.1.1 Household Characteristics

In 2022, Bimini had 1,130 households, up from 751 in 2010, marking a 50% increase in households over the 12-year period.[20] The average household size in Bimini declined from 2.7 persons in 2010 to 2.1 in 2022, which is now among the smallest household sizes in The Bahamas. This suggests a growing trend toward smaller household units, which may reflect changes in family structure, an aging population, or a higher number of seasonal or single-occupancy dwellings related to tourism.

Table 4. Population and Household Characteristics for 2010 and 2022

	2010			2022		
Island	**Population**	**# of Households**	**Average Household Size**	**Population**	**# of Households**	**Average Household Size**
All Bahamas	351	102,862	3.4	398,165	119,138	3.3
New Providence	246,329	70,222	3.5	296,732	79,659	3.7
Grand Bahama	51,368	15,140	3.4	46,740	17,821	2.6
Bimini	**1,988**	**751**	**2.7**	**2,361**	**1,130**	**2.1**

	2010			2022		
Island	**Population**	**# of Households**	**Average Household Size**	**Population**	**# of Households**	**Average Household Size**
All Bahamas	351	102,862	3.4	398,165	119,138	3.3
New Providence	246,329	70,222	3.5	296,732	79,659	3.7
Grand Bahama	51,368	15,140	3.4	46,740	17,821	2.6
Bimini	**1,988**	**751**	**2.7**	**2,361**	**1,130**	**2.1**

Despite its small size, Bimini has one of the highest population densities in the country, rising from 180.7 persons per square mile in 2010 to 214.6 in 2022.[21] This density places additional strain on basic infrastructure such as water supply, sanitation, and waste management, issues that the current water mains project aims to address.

[20]Bahamas National Statistical Institute. (2022). 2022 Census of population and housing: Official census results and data highlights summary. Nassau, The Bahamas. 2022-Census-Report-1st-Release-12-February-2025-FINAL-20250526040559.pdf

[21] Bahamas National Statistical Institute. (2022). 2022 Census of population and housing: Official census results and data highlights summary. Nassau, The Bahamas. 2022-Census-Report-1st-Release-12-February-2025-FINAL-20250526040559.pdf

7 IDENTIFICATION AND ASSESSMENT OF ENVIRONMENTAL AND SOCIAL IMPACTS & RISKS

This section presents an assessment of the anticipated environmental and social impacts associated with the construction and operation of the proposed water mains along the Port Royal corridor in South Bimini. The analysis is based on a qualitative, criteria-based methodology that considers the type, magnitude, duration, reversibility, and spatial extent of each impact.

The assessment draws on field observations, site-specific baseline data, and relevant national and international safeguards frameworks. Emphasis is placed on the construction phase, where most impacts are expected to occur, with consideration also given to long-term operational risks.

7.1.1 Data Sources and Tools

The assessment used a combination of desktop review, site inspections conducted on July 15 and 16, 2025, and reference to the national SESA methodology and relevant Bahamian legislation. Supporting sources included but not limited to:

- The Third National Communication to the UNFCCC (March 2024)
- Think Hazard risk profiles
- Bahamas Protected Area Registry
- Pacific Disaster Center Island Risk Profiles
- Vegetation and biodiversity reference texts
- The National Invasive Species Strategy (2013)
- Protected Trees Order (2021)
- 2022 Census of Population and Housing: Official Census Results and Data Highlights Summary

7.2 ASSESSMENT METHODOLOGY

This ESMP follows the standardized methodology outlined in the SESA for this project. The methodology is designed to identify, evaluate, and manage the potential impacts of water infrastructure projects across both construction and operational phases.

7.2.1 Impact and Risk Assessment Process

The process for assessing environmental and social risks and impacts consists of four core steps:

1. **Impact Identification:**
   This step determines what environmental and social changes may result from the proposed activities. For this project, the main construction activities include trench excavation, pipe installation, and backfilling. The operational phase includes the continued use and maintenance of the potable water network.

2. **Impact Assessment:**
   Each identified impact is evaluated based on its expected magnitude, geographic scope (direct or indirect area of influence), probability of occurrence, sensitivity of the receiving environment, and whether the impact is temporary or permanent. The assessment considers both the physical and biological environment (e.g., soils, hydrology, flora, fauna) and the socio-economic context (e.g., access, safety, infrastructure services).

3. **Mitigation and Enhancement Measures:**
   Appropriate environmental and social mitigation measures are proposed to eliminate or reduce negative impacts and to enhance potential benefits. Measures are prioritized based on the mitigation hierarchy: (i) avoid, (ii) minimize, (iii) restore/rehabilitate, and (iv) offset or compensate.

4. **Residual Impact Determination:**
   After mitigation measures are applied, residual impacts are re-evaluated to assess their significance. This considers the effectiveness of the proposed mitigation and the likelihood of lingering risks or benefits.

7.2.2 Project Activity Phases Considered

Impacts and risks are assessed across two main project phases:

- **Construction Phase:**
  Activities include material storage, movement of machinery and vehicles affected by the work, cleaning of the land, excavations, movement of soils, civil works for infrastructure upgrades (i.e. trenching, pipe laying, backfilling, and site clean-up). These may result in temporary air quality disturbances, dust, noise, minor soil displacement, and disruption to roadside vegetation.

- **Operation and Maintenance Phase:**
  This involves operation and maintenance of the infrastructure. Activities conducted during infrastructure maintenance may involve excavations for repairs due to leaks or losses.

Decommissioning was not included in this assessment.

7.2.3 Environmental and Social Components Evaluated

The following components were considered in the impact assessment:

- **Physical Environment:** Air quality, noise and vibration, hydrology and groundwater, soils, flora and fauna, waste generation, existing contamination, and climate/disaster sensitivity.

- **Biological Environment:** Flora (including protected trees), fauna (including common and expected species), and sensitive habitats.

- **Socio-Economic Environment:** Community access and mobility, Occupational Health and Safety, Community information and participation, Coordination with service providers, Chance Find Procedure.

For the impact identification, the **interactions between the project phases a**nd **the environmental components** (physical, biological, and socioeconomic environment) were analysed. Table 5 presents the identified impacts of the project.

Table 5. Environmental Impacts Matrix

Environmental Component	Construction Phase Impact	Operational Phase Impact	Residual Risk (Post-Mitigation)
Air Quality	Temporary dust generation during trenching, backfilling, and spoil handling in dry and windy	No emissions; water mains are underground and passively operated.	Low

	conditions. Minor emissions from construction equipment.		
Noise & Vibration	Intermittent noise and minor ground vibration from excavation equipment and vehicle movement. Limited receptors in vicinity reduce sensitivity.	No noise or vibration anticipated during routine operations.	Low
Hydrology and groundwater	Localized pooling and waterlogging may occur due to compacted soils, flat topography, and absence of drainage. No risk of direct discharge or interaction with water bodies.	Improves long-term potable water access; no operational hydrological impacts.	Low
Soils	Sandy, unconsolidated soils are prone to collapse and disturbance if left exposed. Temporary loss of structure due to trenching and staging.	Stable after backfilling; minor impact only during maintenance or emergency repair.	Low
Flora & Fauna	Limited clearance of roadside vegetation; no protected species observed in direct work zone. Temporary disturbance of small fauna possible.	No anticipated impact under normal operation.	Low
Waste Generation	Vegetation debris, packaging, and minor domestic waste. Risk of dispersal due to lack of containment and windy conditions.	No significant waste generated post-construction.	Low
Existing Contamination	No evidence of contaminated soils, buried waste, or hazardous materials in project footprint. Sites for staging avoid waterlogged or sensitive areas.	Not applicable.	Negligible
Climate/Disaster Sensitivity	Corridor subject to seasonal heavy rainfall, high winds, and occasional flooding during hurricanes. May affect trench stability and material staging.	Infrastructure is climate-resilient and designed for low-elevation settings; minimal exposure.	Low

7.2.4 Summary of Social Impacts

The expansion of potable water access to South Bimini Port Royal is expected to generate substantial positive social impacts for the island. As one of the main residential communities a reliable water supply will improve hygiene, sanitation, standard of living and wellbeing of the residents.

The project also contributes to public health outcomes by reducing dependence on intermittent or poor-quality water sources and ensuring compliance with food safety and sanitation standards.

Potential social risks during the construction phase include temporary noise, dust, and minor disruptions to access for residents. However, these risks are short-term, localized, and manageable through mitigation strategies such as phased work schedules, public notices, and stakeholder engagement.

Social Component	Construction Phase Impact	Operational Phase Impact	Residual Risk (Post-Mitigation)
Community Access and Mobility	No direct change during construction	Improved access to reliable potable water for airport staff and travellers	**None**: benefits sustained post-installation
Occupational Health and Safety	Heat stress, dust inhalation, noise, vibration, machinery-related hazards and sanitation risks near work zones	Consistent water supply improves hygiene, reduces reliance on unsafe sources	**Low**: mitigated through proper construction protocols
Service Delivery and Public Health	Exposure to dust/noise; minor work disruptions	Better sanitation and working conditions for airport personnel	**Low**: if temporary impacts are managed
Community Livelihoods	Small disruption to residential flow and access	Enables future residential and tourism growth, and economic diversification	**None**: long-term socioeconomic benefit
Equity and Service Distribution	No direct impact during works	Supports more equitable access to reliable services in South Bimini	**None**: improves service delivery gap

7.3 PHYSICAL ENVIRONMENT IMPACTS

This section outlines the anticipated physical environmental impacts associated with the construction and operation of the potable water mains infrastructure within the Port Royal area in South Bimini. The analysis focuses on key components of the physical environment, air quality, noise and vibration, soil stability, water resources, and waste generation, during all phases of project execution, including mobilization, trenching, installation, and post-construction.

Although the project footprint is modest in scale and its operational function is passive, site conditions in Port Royal present specific sensitivities. These include loosely compacted sandy soils, irregular ground elevation, seasonal surface water pooling, and residential proximity to the canal network. The trenching works will occur along unmarked, unpaved road shoulders, many of which are bordered by landscaped yards, canal-access paths, and patches of native or ornamental vegetation. The access road leading up to the community, forms the primary construction coordior and introduces additional sensitivities related to dust generation, surface stability, and equipment access. While no protected ecological zones fall within the works footprint, healthy mangrove stands and canal-side vegetation lie beyond the trench zone and require indirect consideration during construction planning.

Identified impacts are expected to be localized, short-term, and reversible, with most concentrated within the DAoI and managed using standard environmental controls. Risks to surrounding vegetation or private property will be minimized through clear demarcation of work zones and equipment access planning. The nature of the terrain, particularly the mix of sandy substrate and occasional rocky patches, requires phased excavation and timely backfilling to avoid trench instability and water retention delays. Along the access road, the lack of formal drainage and the loose calcareous road base may increase susceptibility to rutting and temporary softening during wet conditions, requiring adaptive construction sequencing.

During the operational phase, no significant environmental risks are anticipated. The mains will be fully buried, operate without emissions, and will not require above-ground infrastructure. Importantly, the alignment avoids any mangrove systems, aquatic habitats, or protected tree species, and no critical ecological or hydrological features will be disturbed.

All environmental impacts have been assessed based on magnitude, duration, probability, and likelihood of recovery, and have been addressed through targeted mitigation and monitoring measures included in the ESMP, ensuring compliance with The Bahamas' national environmental regulations and the IDB's ESPS.

7.3.1 Air Quality: Dust, Emissions, and Historical Contamination Risks

Temporary degradation in air quality may occur during trenching and earthworks due to dust emissions from the sandy, loosely compacted soils that characterize Port Royal's road shoulders. Dust generation is expected to be greatest along the access road leading up to the community, where vehicle movement and excavation activities disturb the dry calcareous surface. To control dust, contractors will be required to wet active work zones and stockpiled materials, particularly during dry or windy conditions. Vehicles transporting aggregates or excavated soils must be covered with tarpaulins, and vehicle speeds must be limited on unpaved surfaces. With these controls in place, residual air quality impacts are expected to remain **low and temporary**.

There are no known sources of legacy soil contamination or hazardous airborne emissions within the area of influence, and no cumulative air quality risks have been identified. **With mitigation measures in place, air quality impacts are expected to be of low magnitude, short-term in duration, and highly probable during the construction phase.** These impacts will remain localized to the immediate work zone and are fully reversible upon demobilization. No residual air quality impacts are expected during the operational phase, as the water mains are fully underground and non-emitting.

7.3.2 Noise and Vibration Impacts

Short-term noise and vibration will result from trench excavation, pipe laying, equipment movement, and backfilling activities. Port Royal is a tranquil, residential community with canal-front homes located near the trench alignment, which increases sensitivity to construction-related noise. Noise levels may also fluctuate along the access road leading up to the community, where machinery will move between work segments and operate in closer proximity to vegetated buffers and property entrances. However, works will be phased in short segments, restricted to daytime hours, and executed with small to mid-sized machinery suitable for narrow roadside corridors. Pre-construction notifications will be issued to residents to ensure awareness of potential disturbances.

There are no vibration-sensitive facilities or historical structures in the vicinity, and the construction techniques do not involve pile driving or heavy impact equipment, keeping vibration levels well within acceptable thresholds. **Overall, noise and vibration impacts are classified as low to moderate in magnitude, temporary in duration, and highly probable during the construction period.** Impacts

will be confined to the direct area of influence and are considered fully reversible. During the operational phase, no noise or vibration impacts are anticipated, as the installed infrastructure does not involve mechanical systems or emit operational sound.

7.3.3 Water Resources: Groundwater, Surface Water, and Coastal Areas

Port Royal experiences intermittent surface water pooling after heavy rainfall, primarily due to its unpaved compacted roads, variable terrain, and the absence of formal drainage infrastructure. Along the access road leading up to the community, shallow depressions and low-lying segments further contribute to temporary ponding, which may affect construction schedules and soil stability if unmanaged. While widespread flooding is uncommon, field observations confirm that depressions in the roadway and uneven gradients contribute to localized water retention. Although the project does not involve direct abstraction from groundwater or discharge into the nearby canal system, unmanaged runoff during construction, especially during the rainy season, could result in sediment-laden water pooling within work zones, potentially reducing soil stability and delaying trenching activities.

The area is underlain by porous limestone with a shallow freshwater lens, which increases susceptibility to infiltration-based contamination if waste or fuel is improperly stored. However, the project design includes no hazardous discharge points or effluent-generating activities. **Given these site-specific conditions, potential impacts to water resources during construction are assessed as low to moderate in magnitude, short-term in duration, and highly probable in the absence of mitigation.** These impacts will be limited to the immediate trench alignment and are fully reversible through standard drainage controls and site housekeeping. No operational-phase impacts to water resources are anticipated, as the mains will operate passively and will not affect local hydrology or groundwater dynamics. The long-term effect is considered neutral to positive, given the enhanced reliability of water access and reduced reliance on rain catchment systems during drought or storm events.

7.3.4 Soil: Erosion, Contamination, and Compaction

Soils in Port Royal are primarily composed of loosely compacted sandy substrate with occasional shell fragments and limestone outcrops. These conditions, typical of many Bahamian coastal communities, present moderate vulnerability to erosion, rutting, and surface degradation, particularly when exposed during construction. The access road leading up to the community exhibits visible signs of rutting and uneven compaction, particularly in high-use sections, which may be temporarily exacerbated by equipment movement and trenching activities. Site inspections confirmed that unpaved segments of the roadway are prone to pothole formation and uneven surfaces, which may worsen with excavation and vehicle movement if stabilizing measures are not implemented.

The construction process will involve trenching through road shoulders and staging in unpaved or grassed roadside areas. Spoil piles placed too close to vegetated areas or left uncovered may also contribute to sediment dispersal by wind or storm runoff. Additionally, unprotected trench walls in sandy soils can be unstable, especially under saturated conditions following rainfall. Despite these risks, the corridor lacks steep slopes or gullies, reducing the likelihood of large-scale sediment transport.

According to the assessment methodology, soil impacts are expected to be moderate in magnitude, highly probable, and short to medium in duration, primarily during trenching, backfilling, and heavy equipment movement. These impacts are confined to the direct work zone and are reversible through proper compaction, stabilization, and restoration of disturbed areas. Once construction is complete, no significant soil-related impacts are anticipated during the operational phase, as the pipeline will be buried, and the road shoulders reinstated using native materials.

7.3.5 Waste Management

Construction activities within the Port Royal community are expected to generate a range of non-hazardous waste streams, including excavated spoil, minor vegetation debris, packaging from construction materials, and domestic waste produced by site personnel. Because the access road leading up to the community is unpaved and bordered by vegetation, lightweight waste is more likely to disperse into roadside areas if not properly contained. The community's limited formal waste infrastructure further elevates the importance of effective waste control.

Given the existing environmental conditions, lightweight materials such as plastics, packaging, or sediment, could easily disperse into adjacent vegetated areas, residential yards, or canal buffers during wind or rainfall events. Accumulated waste may also obstruct property access, degrade the visual environment, and attract pests if not routinely removed. In a canal-based community, poor waste handling poses an additional risk of indirect runoff or litter migration into waterways, potentially affecting water quality, marine life, and nearshore aesthetics.

No chemical or hazardous waste is anticipated; however, limited quantities of hazardous or regulated waste may arise during construction, including used oils and filters, spill-contaminated soils, oily rags, and personal protective equipment (PPE) contaminated with fuel or lubricants, all of which must be properly contained, labeled, and disposed of through approved waste management channels.

The anticipated waste impacts are considered low in magnitude since the materials generated are non-toxic, limited in volume, and short-term in nature. However, without structured management, the likelihood of localized impacts could increase, especially along unpaved corridors where debris dispersal is more likely. To prevent these issues, timely collection, containment, and off-site disposal at authorized facilities will be essential. All waste handling should follow the procedures outlined in the Contractor's Environmental and Social Management Plan (ESMPc), including segregation of waste streams, daily site housekeeping, and post-construction cleanup to restore the community's natural and residential setting.

7.4 BIOLOGICAL ENVIRONMENT IMPACTS

This section assesses the potential impacts of water mains construction on local biological resources in Port Royal, including vegetation, fauna, and general habitat conditions. Unlike Airport Road, the Port Royal community features a mix of landscaped residential yards, canal-edge vegetation, and patches of native flora. While the area does not intersect any formally designated ecological reserves, KBAs, or IBAs, the project alignment runs adjacent to vegetated roadside verges and informal green spaces, many of which provide habitat functions or ecological buffering along this canal-based community. This includes the access road leading up to the community, which is bordered by naturally regenerated shurbs, grasses, and small trees that contribute to mircohabitat value and provide ecological connectivity along the unpaved corridor.

Although the corridor is developed, vegetated setbacks between roadways and the canal, along with scattered native plants and occasional protected tree species, contribute to microhabitat conditions that support small fauna, soil stabilization, and aesthetic value. The access road leading up to the community, in particular, features vegetated margins that stabilize sandy soils and support common reptile, bird, and invertebrate species. These vegetative buffers are especially important in maintaining local ecological function in a community where natural and residential features blend. **The expected impacts to biological resources are low to moderate in magnitude, short in duration, and highly probable during active construction.** However, with proper site controls and restoration, these impacts are

localized and fully reversible. Site-level measures to manage these risks are included in the ESMP, ensuring compliance with the Forestry Act (2010), the Protected Trees Order (2021), and the DEPP permitting requirements.

7.4.1 Flora and Vegetation Cover

Vegetation along the Port Royal corridor is discontinuous and consists of a mosaic of ornamental landscaping, native shrubs, scattered fruit trees, and canal-side flora. The access road leading up to the community also supports roadside vegetation typical of disturbed but functioning coastal environments. Field visits identified common native and ornamental species, and fruit-bearing trees. The edges of some canal zones also support healthy patches of mangroves, though these remain outside the trenching zone and are not expected to be directly impacted.

Roadside vegetation is typical of disturbed but functioning residential environments, with natural buffers transitioning into driveways, canal paths, and manicured lawns. Along the access road leading up to the community, these buffers also serve as minor ecological corridors that support small fauna and help reduce dust and surface erosion. Given the linear nature of the works, trenching must be carefully coordinated to avoid ornamental plantings, driveways, and any naturally occurring protected species. Pre-construction walkthroughs will be conducted to identify and document any species listed under the Protected Trees Order (2021). Where pruning or removal is unavoidable, national permitting under the Forestry Act (2010) and clearance from the Department of Environmental Planning and Protection (DEPP) will be required.

Vegetation disturbance is expected to be minimal and confined to previously altered road shoulders. Post-construction restoration will prioritize replanting with salt-tolerant native species, aligned with existing roadside vegetation. **The anticipated impacts to flora are therefore low in magnitude, highly probable during trenching, and short in duration, with all effects considered reversible through revegetation and natural recovery.**

7.4.2 Fauna and Wildlife Disturbance

While no critical terrestrial habitats or known wildlife corridors were identified within the trenching zone, the canal-edge vegetation and adjacent shrubbery offer habitat for commonly encountered fauna such as Brown Anole (*Anolis sagrei*) and the Northern Curly-tailed Lizard (*Leiocephalus carinatus*). Feral cats and rodents may also be present. Vegetated margins along the access road leading up to the community similarly support small reptiles, ground-feeding birds, insects, and occasional land crabs, reflecting a typical assemblage of fauna adapted to lightly disturbed roadside environments. These species are adaptable and not considered sensitive to temporary construction-related disturbances.

During excavation, noise, vibration, and worker activity may temporarily displace these animals from the immediate area. However, due to the patchy nature of the vegetation and the residential layout, fauna are expected to return once works are complete. Short-term disturbances may be more apparent along the access road leading up to the community, where fauna often use the roadside vegetation as cover, but these impacts remain minor and reversible. **The impact to fauna is assessed as low in magnitude and short in duration, with moderate probability of encounters during early morning or post-rain periods. Impacts are localized to the direct work zone and fully reversible post-construction.**

Standard site protocols will include pre-clearing inspections, worker orientation to avoid wildlife disturbance, and incident reporting procedures if nests, burrows, or injured animals are discovered. Feeding, hunting, or trapping of fauna by workers will be strictly prohibited.

7.5 SOCIAL IMPACTS

7.5.1 Community Access and Mobility

Temporary and localized access restrictions may occur during trenching, pipe installation, and backfilling in Port Royal. As works will take place primarily within the roadside verge, only short sections of one lane may be partially obstructed at a time on the two-lane roadway. Minimal disruption to traffic flow, pedestrians, and local access is therefore expected. Work sequencing will be planned to minimize delays and avoid full lane closures, ensuring continuous access to key facilities such as the airport, ferry terminal, and nearby businesses.

The anticipated impact on community access and mobility is considered **low to moderate in magnitude**, **short-term in duration**, occurs in the direct area of influence, **highly probable during construction**, but **localized and fully reversible** upon completion. No adverse impacts are expected during operation, as the water mains will be buried and non-intrusive.

7.5.2 Occupational Health and Safety

Construction activities present potential occupational health and safety (OHS) risks to site workers, including exposure to heat stress, dust inhalation, noise, vibration, and machinery-related hazards. Additional risks may arise from trench instability, vehicle movements, and manual handling of pipes and fittings.

Contractors are required to prepare and implement a **Health, Safety, and Environmental (HSE) Plan**, consistent with national labor standards and IDB Environmental and Social Performance Standard 2 (ESPS 2). The plan must include:

- Mandatory use of personal protective equipment (PPE);
- Daily safety briefings and task-specific training;
- Heat stress management protocols, including rest breaks and hydration stations;
- Emergency response procedures and first-aid provisions on site.

The OHS impact is assessed as **moderate in magnitude**, **short-term in duration**, occurs in the direct area of influence and **highly probable** without proper management. However, with the application of standard health and safety protocols, residual risks are expected to be **low** and **fully manageable**. No operational OHS impacts are anticipated, as the infrastructure is passive and will require only routine inspection.

7.5.3 Service Delivery and Public Health

During construction, minor interruptions to local utilities or temporary inconvenience to road users may occur. However, the long-term effect of the project is **strongly positive**, as it will extend reliable access to potable water for residents, businesses, and public institutions in South Bimini. The improvement in water quality and availability will directly enhance public health, reduce household costs associated with bottled water or rainwater catchment, and support hygienic practices in schools, clinics, and hospitality establishments.

Coordination with utility providers and public agencies will ensure that any temporary disruptions are minimized. Communication with affected communities, through notices, public briefings, and the **Grievance Redress Mechanism (GRM)**, will help manage expectations and maintain transparency throughout implementation.

Service delivery impacts are classified as **low to moderate in magnitude**, **short-term** during construction, and **highly beneficial in the long term**. The operational phase will yield sustained social benefits through improved water reliability, equity, and institutional functionality.

8 DISASTER AND CLIMATE CHANGE RISK ASSESSMENT

This section presents the results of the Disaster and Climate Change Risk Assessment (DRA) for Port Royal water mains project in Bimini. The objective is to evaluate the extent to which the proposed works may be exposed to, or exacerbate, natural hazards, and to determine the overall risk classification to inform resilience planning and mitigation.

8.1.1 Legal Framework

The primary regulation relevant to risk management for the Program is:

Disaster Risk Management Act (2022): The Disaster Management Plan of 2022 for the Bahamas outlines a comprehensive approach to disaster risk management, aiming to mitigate socio-economic and environmental impacts, including those exacerbated by climate change. It promotes the active involvement of all societal sectors and stakeholders in planning, financing, and executing disaster response and recovery efforts. Key provisions include the establishment of critical infrastructure such as the National Disaster Emergency Operations Centre (NEOC), early warning systems (EWS), and humanitarian assistance standards. The Act also defines the roles and responsibilities of the Disaster Risk Management Authority (DRMA), a body responsible for disaster risk management in The Bahamas that merges the former National Emergency Management Agency (NEMA) and Disaster Reconstruction Authority (DRA), local administrators for Family Islands, public institutions, and the Minister of Finance across all phases of disaster management, from alert to rehabilitation and recovery, and establishes funds for disaster response, risk reduction, and Risk Management Plan, and the National Disaster Emergency Plan, to be prepared by the authority, as well as requiring every local administrator to prepare, after consultation with the Disaster Risk Management Consultative Committee a Local Disaster Risk Management Plan and a Local Disaster Emergency Plan. Additionally, it outlines procedures for international assistance, ensuring a coordinated and inclusive approach to disaster resilience and mitigation in the Bahamas.

ESPS 4, 'Community Health and Safety,'. In compliance with this standard, all projects involving infrastructure works financed with Program funds must undergo a Disaster Risk Analysis using the IDB Methodology.

8.2 REFERENCE FRAMEWORK AND METHODOLOGY

The methodology employed for this evaluation is delineated in the IDB document “Disaster and Climate Change Risk Assessment Methodology for IDB Projects”. This methodology is structured around three core pillars:

- Identification of Hazards and Vulnerabilities: This involves pinpointing the natural hazards that may impact a project, as well as assessing the physical, social, and economic characteristics that could render it vulnerable to these hazards.
- Risk Assessment: This entails estimating the likelihood of adverse events occurring and evaluating the potential consequences for the project.
- Risk Management: This includes implementing measures to reduce the risk from disasters and climate change, such as prevention, mitigation, and preparedness strategies.

The IDB methodology is designed to be flexible, allowing it to be tailored to the specific needs of each project. It encompasses various phases and steps, with efforts and resources allocated according to then identified risk levels. The steps outlined in the IDB methodology are illustrated in the accompanying figure.

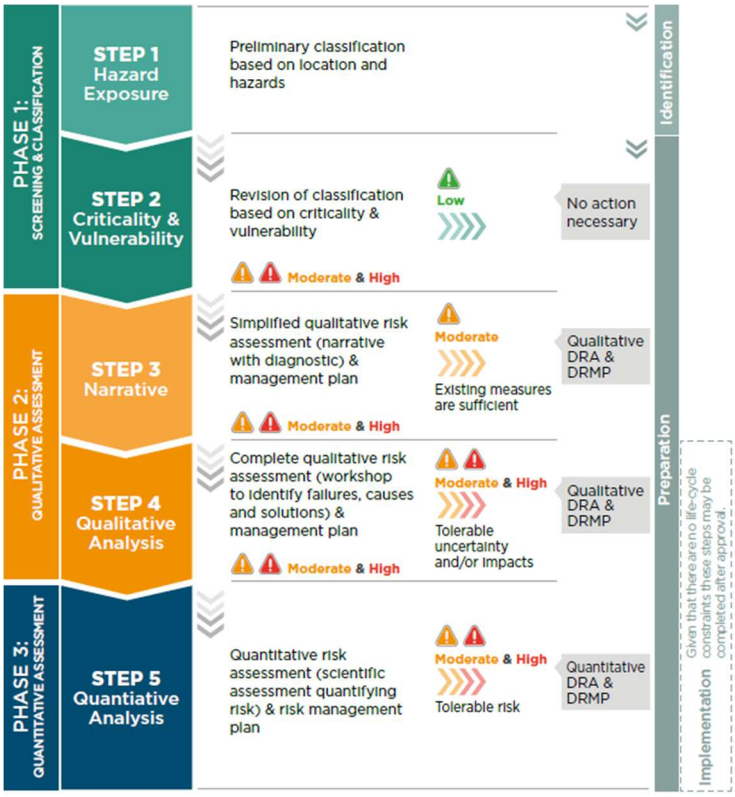
The analysis follows the five-step process outlined in the IDB's 2019 guidance document, which includes (Figure 2)[22]:

- **Hazard Exposure**: preliminary classification based on location and hazards
- **Criticality and Vulnerability**: revision of classification based on criticality and vulnerability
- **Narrative Assessment**: simplified qualitative risk assessment (narratives with diagnostic) & management plan
- **Qualitative Analysis:** Complete qualitative risk assessment (workshop to identify failures, causes and solutions) & management plan
- **Quantitative Analysis**: Quantitative risk assessment (scientific assessment quantifying risk) & risk management plan

Each risk is rated qualitatively as low, moderate, or high based on the severity of impacts and likelihood of occurrence.

[22] Inter-American Development Bank (IDB). Disaster and Climate Change Risk Assessment Methodology for IDB Projects: Technical Reference Document. 2019. https://publications.iadb.org/en/disaster-and-climate-change-risk-assessment-methodology-idb-projects-technical-reference-document

Figure 2. Disaster and Climate Change Risk Assessment Methodology[23]



8.2.1 Procedure

In accordance with the IDB Methodology, the process is developed through the following steps:

Step 1: Exposure to Threats

Current and future threats are identified, and the level of exposure of the project to each threat is determined.

Step 2: Criticality and Vulnerability

The level of vulnerability and criticality is assessed by considering the potential for losses and damages that could result from project activities in the event of failure, in relation to the existing physical, environmental, and socioeconomic conditions.

A simplified and qualitative analysis of the project risk is conducted, considering the previous steps and available information about the project design and the environment.

Based on this analysis, mitigation measures for the identified risks are proposed and structured within the Disaster Risk Management Plan (DRMP).

The activities undertaken as part of the risk assessment and the findings of this procedure are detailed below.

[23] Inter-American Development Bank (IDB). Disaster and Climate Change Risk Assessment Methodology for IDB Projects: Technical Reference Document. 2019. https://publications.iadb.org/en/disaster-and-climate-change-risk-assessment-methodology-idb-projects-technical-reference-document

8.2.1.1 Step 1: Hazard Exposure

The Port Royal water mains project in South Bimini is located in a low-lying, canal-based residential community in South Bimini characterized by flat terrain, sandy and rocky soils, and limited drainage infrastructure. These conditions, combined with the area's coastal exposure and low elevation, increase susceptibility to flooding, stormwater accumulation, and hurricane-related hazards. Construction activities will occur along narrow residential corridors adjacent to waterways, including the access road leading up to the community, which consists of unpaved, compacted sand and marl surfaces that are prone to rutting, heat exposure, and temporary water pooling. These road conditions introduce additional sensitivities related to trench stability, equipment mobility, and worker safety during rainfall or high-heat periods. Runoff management, trench stability, and heat exposure present additional operational and occupational safety considerations.

The table below summarizes the primary hazard exposures, their contributing factors, and the potential effects on construction activities and worker safety:

Table 6. Relevant hazards for the Port Royal Community and Access Road Water Mains works

Hazard	Contributing Factors	Potential Impacts	Hazard Risk Level
Flooding and Stormwater Accumulation	Flat, low-lying terrain; compacted sandy soils; absence of formal drainage; proximity to canals; unpaved access road leading up to the community prone to surface ponding	Water pooling, trench collapse, restricted access, equipment delays, and increased vector risks	Moderate
Tropical Cyclones and Storm Surge	Coastal location within the Atlantic hurricane belt; seasonal storm activity	Wind damage, heavy rainfall, debris hazards, temporary work stoppage, and risk to worker safety	Moderate
Extreme Heat	High ambient temperatures and limited shade	Worker heat stress, dehydration, reduced productivity, and occupational health risks	Low
Soil Erosion and Trench Instability	Unconsolidated sandy soils and rainfall during excavation; loose access road substrate vulnerable to rutting and sloughing	Trench wall failure, sediment displacement, construction delays, and injury risk	Moderate
Runoff and Canal Interaction	Improper containment of spoil or materials near vegetated buffers	Sediment transport toward canal edges, temporary turbidity, and visual degradation	Low

Although the project alignment is not directly exposed to marine wave action, secondary storm impacts, such as rainfall-induced runoff, sediment movement, and temporary waterlogging, require proactive management. This is particularly important along the access road leading up to the community, where unpaved surfaces and shallow depressions can increase localized flood risk. These risks will be mitigated through stormwater diversion, secured material storage, and adherence to the project's Disaster Risk Management Plan (*Section 6.1.2*).

An internal hazard risk analysis was conducted to better characterize specific exposures and guide the development of targeted mitigation strategies. This supplementary analysis identified flooding/stormwater accumulation and soil erosion/trench instability as moderate-level hazards requiring close attention during site preparation and execution. Other hazards, such as extreme heat, tropical cyclones, and runoff interaction with canals, were assessed as lower risk but remain important from an environmental protection and occupational safety standpoint.

This hazard profile guides both design considerations (e.g., erosion control, pipe bedding stability, and drainage planning) and construction practices (e.g., weather preparedness, trench protection, worker hydration, and safety monitoring). Special measures will be required along the access raid to stabilize work surfaces and manage dust and heat exposure. Together, these measures strengthen the climate resilience, environmental protection, and operational reliability of the Port Royal water supply infrastructure.

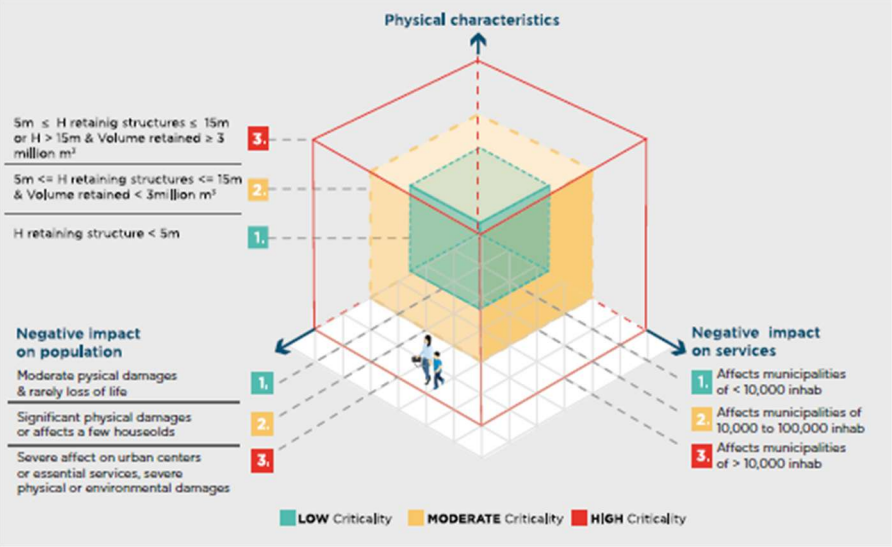
8.2.1.2 Step 2: Project Criticality and Vulnerability

The Port Royal water mains installation represents a critical intervention to strengthen potable water access for households that currently relies heavily on rainwater catchment, bottled water, and private wells. Although the project area is not densely populated or highly urbanized, it supports an essential public service in a location with limited alternative water infrastructure.

Failure or significant delay in completing the installation could:

- Prolong existing challenges in safe and reliable water access, particularly during the dry season or post-disaster recovery periods.
- Disrupt mobility or emergency access within the community if excavation areas or equipment restrict road use during storm preparation or response.
- Lead to increased costs and material losses if construction is affected by flooding or adverse weather conditions.
- Exacerbate public health and sanitation risks associated with prolonged dependence on untreated or costly water sources.

Figure 3. Criticality and Vulnerability Table for Drainage and Water and Wastewater Infrastructure[24]



8.2.1.2.1 Thresholds for Dimension 1: Impact on Service Functionality

The Port Royal potable water mains installation will serve a small segment of the South Bimini population. In the event of a system failure or temporary disruption, only a limited number of residents would be affected, and restoration could be achieved quickly through existing maintenance protocols. Given the localized nature and limited-service area, the **impact on service functionality** is classified as **Low** (*Table 7*). The alignment along the access road leading up to the community also limits broader service disruptions, as any localized excavation damage or isolation-valve shutoff would only affect a short segment of the community and can be rapidly repaired due to ease of access along the roadway.

8.2.1.2.2 Thresholds for Dimension 2: Impacts on Population and Environment

Given the project's limited scale, linear alignment along previously disturbed roads, and absence of nearby protected habitats, any installation or operational failure would have minimal consequence for the population or surrounding environment. The works do not intersect with sensitive ecological areas, and potential leaks or water loss can be contained and remediated without broader environmental impact. Along the access road leading up to the community, any break or leak would infiltrate the porous sandy substrate and remain confined to the roadway corridor, reducing risks of wider environmental impacts and preventing flow from reaching canal-edge vegetation or mangrove buffer. Accordingly, **the impact on population and environment is rated as Low (***Table 7***)**.

8.2.1.2.3 Thresholds for Dimension 3: Physical Characteristics

The proposed system consists of underground PVC pipelines that operate passively and do not rely on mechanical or electrical components. Routine maintenance is limited to periodic valve checks, pressure testing, and pipeline flushing. These straightforward operations require minimal technical complexity or daily oversight. The access road leading up to the community provides direct and uncomplicated access

[24] Inter-American Development Bank (IDB). Disaster and Climate Change Risk Assessment Methodology for IDB Projects: Technical Reference Document. 2019. https://publications.iadb.org/en/disaster-and-climate-change-risk-assessment-methodology-idb-projects-technical-reference-document

for future inspections and maintenance, lowering operational vulnerability and reducing the likelihood of delayed response times during repairs or emergencies.

The primary exposure risks relate to seasonal flooding or high winds, which may damage above-ground fittings such as fire hydrants and valve boxes. Such incidents, however, would not pose significant threats to public safety or ecological integrity. **Based on these considerations, the physical characteristics are classified as Low, consistent with simple maintenance needs and low operational complexity (***Table 7***).**

Table 7. Summary of the Criticality Assessment.

Project Type	Dimension 1 Impact on Service Functionality	Dimension 2 Impacts on Population and Environment	Dimension 3 Physical Characteristics	Classification
Access to Potable Water Supply	**Low** Equipment failures do not impact the delivery of the service	**Low** Equipment failures do not impact the population or the environment	**Low** The equipment doesn't require periodic O&M tasks	**Low**

8.2.1.3 Step 3: Risk Narrative

The hazards present in the project area are flooding and stormwater accumulation, tropical cyclones and storm surge, extreme heat, soil erosion and trench instability, and runoff and canal interaction. For this project, flooding and stormwater accumulation is classified as Moderate, and tropical cyclones and storm surge is classified as Moderate.

The criticality and vulnerability of the infrastructure component of the project is classified as Low, following the criteria shown in the criticality chart for water and sanitation infrastructure:
(i) physical characteristics are Low,
(ii) the impact on service functionality is Low, and
(iii) level of impact on population and environment is Low.
Therefore, the overall criticality is rated as Low.

The inclusion of the access road leading up to the community in the construction alignment slightly increases exposure to surface flooding, rutting, and heat stress; however, these risks remain manageable given the short linear extent, ease of access for emergency response, and the absence of steep grades or vulnerable drainage structures. Climate change has been considered as it may intensify hydrometeorological hazards, particularly increased rainfall intensity and storm surge from tropical cyclones. Such changes may exacerbate water pooling and soil instability along the access road leading up to the community, further reinforcing the need for adaptive construction sequencing and temporary stabilization measures.

Design considerations to manage risks include:

- Appropriate pipe anchoring to reduce risk of displacement from water flow;
- Erosion and sediment control measures to protect trench integrity;

- Storm-preparedness protocols for equipment staging and material containment;
- Strategic placement of hydrants and fittings to minimize exposure.
- Considerations to address exacerbation of risk include:
- Adherence to a Disaster Risk Management Plan (DRMP);
- Implementation of pre-storm inspections and emergency response procedures;
- Avoidance of construction during peak hurricane season where possible.

No significant gaps were identified. The primary uncertainty is the potential for extreme weather variability due to climate change, which will be addressed through flexible scheduling, on-site risk monitoring, and coordination with local emergency response systems.

Overall, the presence of the access road leading up to the community enhances logistical efficiency during construction and maintenance but requires careful management of localized flooding, dust, and erosion to maintain safe access and protect installed infrastructure.

The narrative concluded that for this Moderate risk project there is no need to continue to a complete qualitative risk assessment for the operation, Step 4 of the Disaster and Climate Change Risk Assessment Methodology (DCCRAM), as there are no significant gaps, appropriate measures have been identified and documented in a DRMP, and it is possible to attain a tolerable risk level from these.

The risks identified can be effectively managed through the existing mitigation measures, as outlined in the ESMP and the project's Disaster Risk Management Plan (DRMP) (*Section 6.1.2*). Continued monitoring of the access road leading up to the community, particularly after heavy rainfall or during hurricane season, will help identify early signs of erosion, trench instability, or surface degradation that could affect construction logistics or long-term access to pipeline infrastructure. Adaptive management should be maintained if hazard conditions intensify or community exposure increases.

8.2.2 Disaster Risk Management Plan (DRMP)

This Disaster Risk Management Plan (DRMP) outlines site-specific mitigation measures to address the priority hazards identified for Port Royal water mains project in South Bimini. It is structured according to IDB's 2019 methodology and draws on best practices outlined in the program-wide Disaster Risk Mitigation Measures Table in the Project's SESA.

The DRMP focuses on minimizing risks across all phases of the project, engineering design, construction, and operation and maintenance (O&M), with clearly assigned responsibilities and a distinction between structural and non-structural measures. Because construction will also occur along the access road leading up to the community, several mitigation measures also address the road's unique flood, erosion, dust, and access-related vulnerabilities.

Table 8. Disaster Risk Mitigation Measures for the Port Royal Community (Access to Piped Water Supply)

Hazard Type	Measure Description	Project Phase	Type of Measure	Responsible Entity
Flooding / Surface Water Accumulation	Select valve boxes, washouts, and hydrant locations in slightly elevated or well-drained areas to minimize exposure to pooled water. Where feasible, position components away from depressions along the access road leading up to the community.	Design	Structural	WSC Design Team, Contractor
	Anchor and secure all above-ground components (hydrants, valve boxes) to prevent displacement or floatation during flooding.	Construction	Structural	Contractor, WSC Supervision
	Establish shallow side drains or graded shoulders along the corridor to channel runoff away from open trenches. This is particularly important along the access road leading up to the community, where stormwater frequently pools due to unpaved sandy surfaces.	Construction	Structural	Contractor, verified by WSC
	Implement periodic clearing of vegetated and canal-edge buffers to maintain surface water flow paths and prevent waterlogging.	O&M	Non-Structural	WSC, PEU, Local Government
Extreme Rainfall / Soil Erosion	Limit open trench exposure during the wet season; schedule excavation and backfilling to align with forecasted dry periods. Segment trenching along the access road leading up to the community to reduce exposure of loose sandy material.	Construction	Non-Structural	Contractor
	Cover stockpiles, use silt fencing, and stabilize disturbed areas using compacted fill or native groundcover vegetation. Stockpiles near the access road leading up to the community must be contained to prevent sediment dispersion by wind and vehicle movement.	Construction	Structural	Contractor, supervised by WSC

Tropical Cyclones / Storm Surge (Indirect Exposure)	Secure loose materials, piping, and machinery ahead of storms; activate contractor storm-preparedness protocol. Special staging plans will be required along the access road leading up to the community to prevent windborne debris or blocked access.	Construction	Non-Structural	Contractor, WSC
	Incorporate thrust blocks and reinforced joints at all bends and terminal points to reduce uplift or separation during extreme rainfall or flooding.	Design	Structural	WSC Design Team, Contractor
Heat Stress (Occupational)	Adjust work hours to avoid peak sun; provide shaded rest areas and hydration. Heat exposure is expected to be highest along the open sections of the access road leading up to the community with limited natural shade.	Construction	Non-Structural	Contractor
Trench Collapse / Worker Safety	Use trench boxes or shoring methods in deeper or unstable sections	Construction	Structural	Contractor, WSC
Fire Risk (Minor)	Keep work area free of dry vegetative debris and flammable materials. This applies particularly to road-edge vegetation along the access road leading up to the community.	Construction	Non-Structural	Contractor
Runoff and Canal Interaction	Maintain vegetated buffers between trenching zones and canal edges; avoid stockpiling near waterways.	Construction	Non-Structural	Contractor, WSC
System Redundancy / Supply Interruption	Allow bypass valves to isolate sections during repairs without shutting down entire network	Design	Structural	WSC Design Team
Regular Monitoring	Conduct periodic maintenance checks and walk-through inspections.	O&M	Non-Structural	WSC, Local Government

8.3 SUMMARY OF ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

This Environmental and Social Impact Assessment for the proposed water mains installation within the Port Royal community identifies overall low, short-term, and manageable impacts during construction, with long-term environmental and social benefits once operational. The principal environmental impacts anticipated include temporary dust generation, construction noise, soil disturbance, minor vegetation removal, and waste generation from trenching and material handling. Impacts along the access road leading up to the community are expected to mirror these conditions, with additional attention required to manage dust and temporary surface degradation given its unpaved, sandy substrate. These effects are localized and reversible, and will be effectively managed through measures such as dust suppression, erosion control, waste containment, and limited vegetation clearance. No protected habitats or sensitive species are present within the project direct footprint, and the operational phase will have negligible environmental impacts, as the water mains will be underground, passively operated, and non-emitting.

Socially, the project will deliver substantial positive outcomes by improving access to safe, reliable, and affordable potable water for residents and seasonal occupants of Port Royal. This enhancement will strengthen public health, household stability, and service reliability, while supporting the broader community's climate and disaster resilience. Temporary inconveniences may occur along the access road leading up to the community, including limited driveway access and short-term pedestrian disruptions, though these will be mitigated through phased works, community notification, and clear signage. Occupational health and safety risks will be controlled through worker safety training, provision of PPE, and heat stress management protocols.

The Disaster and Climate Change Risk Assessment classifies the project as moderately vulnerable, given its low-lying coastal setting and limited drainage infrastructure, with potential hazards including flooding, trench instability, tropical storms, and heat exposure. These hazards are particularly relevant along the access road leading up to the community, where unpaved surfaces and shallow depressions may increase susceptibility to localized flooding or soil instability during construction. These risks are confined primarily to the construction phase and will be mitigated through the implementation of the DRMP, which outlines measures such as drainage maintenance, slope reinforcement, storm preparedness, and occupational safety procedures.

Overall, the Port Royal water mains installation is considered environmentally sound, socially beneficial, and climate-resilient, with no significant residual impacts expected following the application of mitigation and management measures. The project will provide lasting improvements in water security, public health, and community well-being for residents and visitors to South Bimini.

9 ENVIRONMENTAL & SOCIAL MANAGEMENT PLAN (ESMP) FOR WATER MAINS WORKS

This Environmental and Social Management Plan (ESMP) provides a structured and actionable framework for implementing environmental mitigation, monitoring, and compliance activities associated with Component 3: Water Mains Works under the broader water supply and sanitation program. The works designed for Port Royal addresses distinct environmental characteristics, construction contexts, and levels of sensitivity. A key feature of the Port Royal alignment is the unpaved access road leading up to the community, which serves as the primary construction corridor and introduces additional

considerations related to dust generation, soil erosion, equipment mobility, resident access, and drainage during and after works.

The EMP supports the operationalization of the findings and recommendations from the Environmental and Social Assessment and is intended for use by the WSC, project contractors, and the supervising WSC staff. It provides a set of site-specific mitigation measures, organized into thematic environmental management programs, alongside defined institutional responsibilities, reporting protocols, and monitoring mechanisms that align with national environmental laws and the IDB's ESPF. Specific controls are included to address the unique environmental and social conditions of the access road leading up to the community, including its sandy substrate, limited drainage features, and close proximity to residential properties.

Key environmental risks addressed in this EMP include:

- Dust emissions and air quality impacts due to trenching through sandy, loose soils in a residential setting; and particularly along the access road leading up to the community where dust generation is highest due to unsealed surfaces;
- Soil instability, erosion, and surface water pooling in low-lying or poorly drained road segments; including depressions and runoff-prone areas along the access road leading up to the community;
- Noise and vibration near occupied homes and community-use buildings such as the local church; with additional intermittent exposure along the access road leading up to the community where equipment will move between work zones;
- Construction-related waste generation in an area with limited roadside containment; with elevated risk of wind dispersal along the open access road leading up to the community corridor;
- Disturbance to native and ornamental vegetation, including protected species and mangrove buffers near the canal; plus trimming or short-term disturbance to vegetation bordering the access road leading up to the community;
- General construction hazards due to extreme weather exposure, flat terrain, and lack of engineered drainage; all of which influence trench stability and access road usability during rainfall events.

Key social risks addressed in this ESMP include:

- Lack of Community access and mobility; including temporary constraints along the access road leading up to the community, which provides the sole vehicular and pedestrian route in several areas;
- Road and traffic impacts;
- Occupational and Community health and safety risks;
- Lack of community information and participation
- Lack of coordination with service providers
- Potential risk of a chance find in the project area -

This plan applies to both construction and early operational phases, with particular emphasis on:

- Site establishment and clearance;
- Trenching and pipe laying activities;
- Backfilling and restoration of road surfaces;
- Sanitary testing and final commissioning.

9.1 ROLES & RESPONSIBILITIES

9.1.1 Design

During the design phase of the interventions, WSC will prepare the bidding documents for the works, and the environmental and social specialist from WSC will incorporate the necessary environmental, social, and occupational health and safety clauses and requirements, both general and specific to the projects, which arise from this ESA and ESMP. These aspects will then be included in the Environmental and Social Technical Specifications of the bidding documents. The bidding documents must outline the minimum content of the Environmental and Social Management Plan for the Construction Stage (*Table 9*).

The proposals received during the bidding process for the works must contain a budget that includes the cost of implementation and compliance with the environmental, social, and occupational health and safety mitigation measures required by the project, to guarantee compliance with the IDB ESPF and applicable national and local regulations.

9.1.2 Construction phase

Prior to the start of the works, WSC will conduct the due diligence with, the DEPP, to obtain the national required Certificate of Environmental Clearance, and the respective nationally accepted EIA and EMP, for the works.

During the Construction Phase, the Contractor Company will be responsible for preparing and implementing the Environmental and Social Management Plan at the construction level (ESMPc) of the project, as well as obtaining the environmental and occupational health and safety qualifications and insurances required according to the national regulatory framework.

The Contractor will also need to obtain others applicable permits, as needed, which could include tree cutting permits for protected trees according to the Protected Trees Act, although not anticipated, excavation and construction permits from the Ministry of Works (MoW).

Before the start of the works, the Contractor must submit to the PEU, for its approval, an Environmental and Social Management Plan at the construction level (ESMPc). The ESMPc of the project will contain, as a minimum, the programs described in Section 9 of this ESA.

Once the ESMPc is approved, the Contractor Company will be responsible for its compliance, using the necessary means to implement the Programs that are formulated within its framework. The Contractor Company must have an environmental and social representative and a person responsible for health and safety matters, who will be responsible for conducting the implementation of the ESMPc. Likewise, the contractor must comply with and ensure that the operators comply with all the provisions contained in said Plan, national and local environmental legislation, appropriate construction codes and best practices and the IDB Environmental and Social Policy Framework, during all stages of the execution of the works.

The Contractor Company will prepare monthly reports to the PEU, detailing the actions and results of the ESMPc implementation.

The inspection, control, and monitoring activities of the ESMPc will be conducted by WSC. WSC may conduct inspection visits, prepare reports for internal use for the Project, and determine and impose corrective measures based on the stipulations of the bidding documents. The environmental and works authority may also conduct control audits of the work.

At the finalization of the works, the Contractor must submit a *Final Environmental and Social Report*, which includes the information corresponding to the implementation of ESMPc, including records of implementation of plans and programs, and a report on compliance with all environmental and social indicators considered at various stages of the project cycle.

9.1.3 Operation and Maintenance

During the operational stage, WSC will be responsible for the operation and maintenance of the infrastructure built under the Project, in accordance with its current environmental policies and environmental and social management systems, including the ESMP for the operational and maintenance stage.

9.1.4 Role of IDB

The IDB will oversee and supervise the implementation of the environmental and social management system for this water mains project. This includes the review and approval of the semi-annual environmental and social compliance reports submitted by WSC, as well as conducting environmental and social supervision missions. This is expected to last throughout project implementation.

Table 9. Roles and Responsibilities for E&S Management of the Projects

Project Cycle Phase	Activity	Responsible Party	Monitoring	Supervision
Design	Grievance Redress Mechanism (for the duration of the Program)	WSC	-	IDB
	Environmental Permits as required by The Department of Environmental Planning and Protection	WSC	-	DEPP
	Executive Project / Engineering Design	WSC	-	IDB
	Environmental and Social Assessment / ESMP	WSC	-	IDB
	Public Consultation / Public Information Campaigns	WSC	-	IDB
	Preparation of E&S Technical Specifications for Bidding Documents	WSC	-	IDB
Construction	ESMPc: Preparation and Implementation Contractors WSC IDB	Contractors	WSC	IDB

	E&S Progress Reports	Contractors to WSC (monthly)	WSC	
	E&S Progress Reports	WSC to IDB (bi-annually)	-	IDB
	Final E&S Report	Contractors	WSC	-
	Final E&S Report	WSC		IDB
Operation	Operation and maintenance of the water and sewage infrastructure	WSC	WSC	IDB (for a period of 3 years after commissioning)

9.2 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLANS

Mitigation measures for both environmental and social impacts were grouped into two different ESMPs, each one targeting different phases of the project:

Construction/installation ESMP: aimed at mitigating the impacts and risks of construction activities.

Operation/maintenance ESMP: measures to be implemented during operation and maintenance activities.

9.2.1 Construction Environmental and Social Management Plans

This ESMP presents the minimum environmental and social guidelines that must be implemented during the construction activities of the project's infrastructure.

The *Table 10*. below presents the requirements of programs included in the ESMP.

Table 10. ESMP for the construction phase of the project.

Program Number	ESMP Plan
1	Monitoring and Control of Compliance with Mitigation Measures
2	Construction Sites Management
3	Air Quality, Noise and Vibrations Management
4	Erosion Control
5	Flora and Fauna Management
6	Waste Management
7	Effluent Management

8	Chemical Substances Management
9	Occupational and Community Health and Safety
10	Traffic and Pedestrian Management
11	Pest and Vector Control
12	Socio-Environmental Training for Site Personnel
13	Disaster Management and Emergency Response
14	Community Information and Participation
15	Coordination with Service Providers
16	Environmental Liabilities Program
17	Chance Find Procedure
18	Works Closure

9.3 MONITORING AND CONTROL OF COMPLIANCE WITH MITIGATION MEASURES

Objective: To ensure that all environmental mitigation measures outlined are systematically implemented, tracked, and corrected as needed during the construction and operational phases of the Water Mains Works. The goal is to maintain compliance with national regulations, safeguard community and environmental health, and align with IDB ESPS.

Summary: This plan establishes a structured monitoring framework that outlines how environmental controls will be implemented in Bimini. Contractors will be responsible for conducting routine inspections, keeping compliance logs, and reporting on environmental mitigation actions. The WSC will oversee verification of compliance through site visits and monthly reviews. In cases where non-compliance is observed, prompt corrective actions will be triggered in accordance with the project's corrective action procedures.

9.3.1.1 Management Measures

Action Area	Management Measure	Corrective Action if Deviations Occur	Timeline
Compliance Verification	Contractors will be responsible for conducting routine site inspections using standardized checklists to verify implementation of air quality, waste, noise, erosion, and vegetation measures.	Retraining of staff; intensified site supervision; resubmission of corrected inspection reports.	Continuous during construction activities

Inspection Protocols	Contractors will document site compliance through weekly inspections, supported by dated photographs and logs. Field engineers must review compliance forms before payment milestones.	Follow-up inspections within 5–7 days; documentation of deficiencies; escalate to WSC if unresolved.	Weekly during active trenching periods
Reporting	Contractors will submit monthly compliance reports (with summaries of mitigation performance, non-compliance issues, and corrective actions) to WSC.	Issue formal non-compliance notice; suspend payment or works for persistent failures.	Monthly, throughout construction phase
WSC Oversight	WSC will assign a site supervisor to monitor the works daily and the WSC PEU or Project Management Team will conduct monthly verification visits and random spot checks across all sites, including Abaco and Bimini.	Request immediate corrective actions; coordinate with IDB for high-risk violations or environmental harm.	Daily/Monthly (random checks in Family Islands)
Non-Compliance Protocol	In cases of significant deviation, Works Inspector or WSC may issue stop-work orders.	Written corrective action plan required within 5 days. Re-inspection required before resumption of work.	As needed, within 5–7 days of infraction
Grievance-linked Monitoring	All community feedback submitted through the project grievance mechanism must be reviewed weekly for any flagged environmental concerns.	Immediate site inspection; issue warning or correction order if claim verified.	Weekly review of grievance logs

9.3.1.2 Monitoring, Indicators, and Responsibilities

Monitoring Parameter	Indicator	Method/Frequency	Responsible Entity
Compliance with mitigation measures	Percentage of measures implemented at each work front	Weekly field inspections using standardized checklist	WSC; Contractor (HSE Officer)
Field supervision reports	Number of non-conformities recorded; trends in observations	Weekly summary reports from contractor and WSC	Contractor; WSC Field Supervisor
Corrective action implementation	Timeliness and completeness of corrective actions	Verified within 7 days of deviation occurrence	Contractor; verified by WSC
Safety and environmental signage	Proper placement, visibility, and maintenance of signage	Checked during each weekly inspection	Contractor
Documentation and reporting	Up-to-date reports, logs, photos, and compliance documentation	Reviewed monthly as part of compliance submissions	Contractor; submitted to WSC

9.4 CONSTRUCTION SITES MANAGEMENT

Objective: To ensure that all construction sites are maintained in a clean, safe, and environmentally responsible manner across all work fronts in Bimini. This plan minimizes environmental degradation, safeguards worker health and safety, and ensures preparedness for potential emergencies throughout the construction phase.

Summary: This management plan outlines site-level protocols that contractors must implement to maintain orderly and environmentally compliant work areas. The plan emphasizes sanitation, materials handling, fire safety, erosion control, and post-construction demobilization. Site-specific measures must be adapted based on conditions such as road layout and vegetation. Contractors are fully responsible for implementing all required protocols, while WSC and its supervising engineer will monitor compliance through scheduled inspections and escalate corrective actions as needed.

9.4.1.1 Management Measures

Action Area	Management Measure	Corrective Action if Deviations Occur	Timeline	Responsible Entity
Site layout and setup	Contractors will designate and mark secure areas for material storage and staging, ensuring safety and containment.	Reorganize storage layout; implement secondary containment; suspend deliveries until corrected.	Prior to mobilization; weekly reviews	Contractor Site Manager; WSC oversight
Waste management area	Contractors will set up labelled bins and maintain a collection schedule; hazardous and non-hazardous waste must be separated.	Immediate cleanup and sorting; reinforce worker training.	Daily checks; weekly disposal log	Contractor
Sanitation and hygiene	Contractors will provide and maintain clean toilets and handwashing facilities with adequate water.	Halt construction if hygiene is compromised; install temporary services.	Daily	Contractor
Safety signage and fencing	Contractors will install and maintain warning and informational signs, reflectors, and secure fencing around active work zones.	Replace missing/damaged signs and fences within 24 hours.	Initial setup; checked weekly	Contractor; verified by WSC
Emergency response readiness	Contractors will equip each site with a stocked first aid kit, fire extinguishers, and reliable communication tools (radio or phone).	Restock kits; replace expired or missing equipment; retrain crew.	Weekly kit check; comms checked daily	Contractor

Fire safety preparedness	Fire extinguishers must be fully functional, accessible, and inspected regularly.	Install before works begin; inspect monthly.	Prior to works and monthly thereafter	Contractor
Drainage and runoff control	Contractors will use berms, silt fences, or other erosion controls to protect nearby drainage paths.	Reinforce barriers; halt trenching during heavy rainfall.	Continuous during trenching	Contractor; monitored by WSC
Emergency training and awareness	Contractors will train all personnel in hygiene, emergency response, fire safety, and site protocols.	Retrain affected workers; require refresher sessions and induction training logs.	Pre-mobilization and quarterly	Contractor HSE Officer
Site demobilization and cleanup	Contractors will remove waste, signage, and temporary structures at the end of each work phase, restoring the area to pre-existing condition.	Delay handover sign-off; require photographic proof of cleanup.	End of construction at each site	Contractor; signed off by WSC

9.4.1.2 Monitoring, Indicators, and Responsibilities

Monitoring Parameter	Indicator	Method/Frequency	Responsible Entity
Site setup and storage layout	Presence of clearly demarcated organized storage and staging areas	Weekly visual inspections; photo documentation	WSC; Contractor
Waste bin availability and use	Labelled bins present; waste is separated and not overflowing	Daily site checks; weekly waste disposal log	Contractor Site Manager
Sanitation facilities functionality	Toilets and handwashing stations present and hygienic	Daily inspections; restocking logs	Contractor
Safety signage and fencing	Signs posted, reflectors visible, fencing intact around all active sites	Weekly checklist inspections	Contractor; verified by WSC
Emergency readiness	Accessible first aid kits, fire extinguishers, and communication devices	Weekly inspections; emergency equipment inventory checklist	Contractor HSE Officer
Drainage and runoff control	Absence of standing water; berms/silt fences functioning	Observations during rainfall; weekly walkthroughs	Contractor; monitored by WSC
Staff emergency preparedness	Number of trained workers; records of induction sessions	Pre-mobilization and quarterly refresher training logs	Contractor (HSE Officer)
Site demobilization compliance	Complete removal of equipment, signage, waste, and restoration performed	Final site walkthrough with photographic evidence	Contractor; signed off by WSC Site Inspector

9.5 AIR QUALITY, NOISE AND VIBRATIONS MANAGEMENT

Objective: To minimize the environmental and community-level impacts associated with dust emissions, vehicle exhaust, and construction-related noise and vibrations during the installation of potable water mains in Port Royal. These impacts are particularly relevant due to the proximity of occupied residences, canal-side homes, and a community church, as well as the unpaved and sandy character of local roadways which increases dust generation.

Summary: Construction activities such as trenching, earthmoving, hauling, and the operation of heavy machinery pose risks to air quality and ambient noise levels. This plan outlines emission controls, dust suppression measures, noise mitigation protocols, and contractor responsibilities. WSC and the supervising engineer will verify field compliance through inspections, community feedback tracking, and review of contractor reports.

9.5.1.1 Management Measures

Action Area	Management Measure	Corrective Action if Deviations Occur	Timeline	Responsible Entity
Equipment emissions	Maintain equipment per manufacturer specs to reduce emissions	Remove or repair malfunctioning machinery	Weekly maintenance log review	Contractor Site Manager
Dust control	Water dusty roads and trenches; limit material drop heights	Apply additional suppression; retrain workers	Daily during dry conditions	Contractor
Haul truck loading	Cover loads with tarpaulin; avoid overfilling	Stop transport until load secured	Continuous	Contractor
Construction timing	Schedule noisy works during business hours	Reschedule non-compliant activities	BiWeekly planning meetings	Contractor; approved by WSC
Stakeholder communication	Implement Construction Communications Plan	Distribute notices; meet with affected stakeholders	Before noisy activities	WSC
Grievance response	Track and resolve dust/noise complaints through(GRM)	Investigate and respond in 3 business days; update log	Within 48–72 hrs of complaint	Contractor/WSC
Noise Levels	High-noise activities will be limited to standard working hours, and advance notice will be provided to adjacent users.	Reschedule noisy activities; notify affected parties; log deviation	Daily during construction	Contractor; approved by WSC
Noise Levels/ Equipment Maintenance	Ensure maintenance of all construction equipment in accordance with manufacturer's specifications to minimize noise emissions	Review equipment logs; repair or replace noisy machinery	Weekly maintenance reviews	Contractor Site Manager
Noise Levels	Discourage unnecessary idling of construction equipment and trucks to	Brief site staff; monitor and issue reminders;	Continuous monitoring	Contractor Site

	minimize noise emissions and environmental impact.	document repeated non-compliance		Manager/Supervisor

9.5.1.2 Monitoring, Indicators, and Responsibilities

Monitoring Parameter	Indicator	Method/Frequency	Responsible Entity
Dust suppression	Work areas are visibly damp; no visible airborne dust during activities.	Daily visual inspections with photo logs.	Contractor; verified by WSC
Equipment emissions	Low or no visible exhaust; up-to-date equipment servicing logs.	Weekly log review and spot checks.	Contractor Site Manager
Noise near receptors	Noise during construction	Ensure works are done during normal working hours and provide advance notice of works commencement to stakeholders in the direct area of influence,	WSC Site Manager
Stakeholder engagement	Notices distributed that specify construction schedule; communication records maintained Consideration will also be given to vulnerable groups and methods of engagement	Reviewed before each new work phase; maintain records of outreach.	WSC
Complaint resolution	Timely resolution of complaints with log updates and feedback to complainants.	Weekly grievance log review and summary of monthly site reports.	WSC

9.6 EROSION CONTROL PLAN

Objective: To prevent soil erosion, sediment displacement, and runoff-related environmental impacts during water mains installation in Port Royal. The plan ensures that soil stability is maintained in an environment characterized by loosely compacted sandy soils, uneven terrain, and localized pooling after rainfall. Given the residential setting and proximity to canals, effective erosion control is critical to prevent sediment dispersion into private yards, roadways, and vegetated areas, while maintaining safe and orderly construction conditions.

Summary: Excavation and trenching along Port Royal's compacted sand and rock roads present short-term risks of erosion and sediment movement, especially following heavy rainfall. Although widespread runoff is unlikely due to limited surface gradients and yard-level vegetation that absorbs excess water, exposed trenches and spoil piles may become unstable or spread fine sediment if not properly managed.

This plan establishes proactive measures to stabilize exposed soils, cover stockpiles, and maintain erosion control features during and after construction. These measures will minimize soil loss, protect nearby properties and vegetation, and prevent sedimentation within the canal margins or roadside drainage depressions.

9.6.1.1 Management Measures

Action Area	Management Measure	Corrective Action if Deviations Occur	Timeline	Responsible Entity
Phasing of works	Schedule trenching in short, phased sections to limit the area of open excavation.	Adjust sequencing; close or backfill exposed sections sooner.	Weekly planning and review	Contractor; verified by WSC
Work zone delineation	Clearly mark trenching zones with cones or temporary fencing to confine equipment and vehicles.	Re-mark boundaries; relocate materials placed outside limits.	Before mobilization and weekly	Contractor Site Supervisor
Excavation limits	Restrict excavation and material stockpiling within designated work zones.	Halt works; retrain personnel on excavation boundaries.	Continuous during trenching	Contractor
Erosion controls	Use small berms or sandbags around excavation points to divert runoff and stabilize slopes.	Repair or replace controls immediately after rain.	During excavation and post-rainfall	Contractor; verified by WSC
Stockpile protection	Cover soil or sand piles with tarpaulin and avoid placing stockpiles near canal edges or residential boundaries.	Replace covers or relocate stockpiles to stable ground.	Daily during excavation	Contractor
Drainage management	Keep roadways and canal-side verges free from sediment; ensure no runoff enters canals.	Sweep and remove sediment; document action in logbook.	After ≥10 mm rainfall or weekly	Contractor
Vegetation preservation	Retain existing lawn, ornamental vegetation where possible.	Replant with native species	Immediately post-construction	Contractor; verified by WSC
Documentation	Maintain a logbook with records, photos, and corrective actions for erosion control activities.	Update logbooks and submit a summary to WSC.	Weekly updates and monthly reporting	Contractor; reviewed by WSC

9.6.1.2 Monitoring, Indicators, and Responsibilities

Monitoring Parameter	Indicator	Method/ Frequency	Responsible Entity
Erosion control structures	Berms, sandbags, and covers in place and intact post-rainfall.	Weekly inspections and after ≥10 mm rainfall.	Contractor; oversight by WSC
Trench exposure	No prolonged open trenches; backfilled sections stabilized promptly.	Weekly inspection with photos in logbook.	Contractor; verified by WSC
Sediment containment	No sediment runoff beyond work area or into canal-side vegetation.	Daily visual checks during works; post-rain inspection.	Contractor
Documentation compliance	Logbook includes inspection records, photos, and corrective actions.	Weekly review and monthly submission to WSC.	Contractor; reviewed by WSC
Vegetation protection	No unnecessary vegetation removal or damage to lawns/ornamentals.	During layout and weekly verification.	Contractor; verified by WSC
Post-rain cleanup	Roads and access paths cleared of sediment within 24 hours of rainfall.	Post-rain inspection and log entry.	Contractor; verified by WSC

9.7 Flora and Fauna Management Plan

Objective: The objective of this plan is to avoid, minimize, and mitigate impacts on native coastal vegetation and any incidental fauna within Port Royal community and internal roadways, that may be affected by trenching and installation of water mains infrastructure. The program emphasizes both preventative actions and restoration commitments in line with good international practices and national requirements.

Summary: Port Royal is a low-density residential community with a mix of manicured yards, scattered ornamental landscaping, native vegetation along verges, and healthy patches of mangroves along the canal. The project area does not intersect with protected areas or mapped critical habitats, and no protected species were observed within the direct footprint. Vegetation along the access road leading up to the community consists of roadside shrubs, grasses, and small trees that may require limited trimming during construction. Contractors must respect flagged boundaries, avoid vegetation removal beyond the trench line, and allow incidental fauna to vacate naturally. Good housekeeping practices must be enforced to avoid unnecessary disturbance to vegetation near docks, driveways, or canal access points.

9.7.1.1 Management Measures

Action Area	Management Measure	Corrective Action if Deviations Occur	Timeline	Responsible Entity

Vegetation boundary marking	Flag trench line clearly and limit any clearing to the immediate work zone.	Reflag zones; retrain workers on vegetation limits.	Prior to site mobilization	Contractor; verified by WSC
Vegetation protection	Avoid clearing ornamental trees, palms, and vegetation near yards, canal edges or roadways.	Pause works; issue non-conformance notice and rebrief site crew.	During site prep and trenching	Contractor
Minimize habitat disturbance	Allow birds, reptiles, or small fauna to vacate naturally; avoid trapping or handling.	Record in fauna log; notify WSC and DEPP if protected species encountered.	Continuous during works	Contractor
Buffer and verge protection	Do not store equipment, fuel, or spoil in vegetated canal buffers, lawns, or soft verges.	Remove material immediately; clean area; log and report deviation.	Ongoing during construction	Contractor Site Manager; verified by WSC
Revegetation and restoration	Backfill and regrade disturbed areas; allow natural regrowth or reseed if needed.	Inspect site 4–6 weeks post-construction; stabilize areas as needed.	Post-construction	Contractor; reviewed by WSC

9.7.1.2 Monitoring, Indicators and Responsibilities

Monitoring Parameter	Indicator	Method/ Frequency	Responsible Entity
Vegetation clearance limits	No excessive clearing beyond flagged trench alignment.	Weekly visual inspections; geo-tagged photo documentation.	Contractor; verified by WSC
Canal-side buffer protection	No materials or vehicles placed within 3–5 ft of mangrove or waterway edge or property entrances along the	Spot checks during construction; log any buffer encroachment.	Contractor Site Supervisor; WSC

	access road leading up to the community.		
Fauna encounters	No evidence of trapped or handled wildlife; fauna vacate site freely.	Continuous observation; log if nests, burrows, or unusual species found.	Contractor
Revegetation progress	Natural regrowth observed or erosion-controlled surfaces maintained.	Visual checks 2–4 months post-works.	Contractor; verified by WSC
Verge and yard integrity	Yards, driveways, and vegetated setbacks restored to pre-construction condition.	Final walkover with homeowner (where relevant); photographic comparison.	End of construction

9.8 AQUATIC HABITAT MANAGEMENT

Objective: To prevent sedimentation, water quality degradation, and physical disturbance to canal-side aquatic habitats, including healthy patches of mangroves, resulting from trenching, spoil stockpiling, altered overland drainage, and equipment movement near waterfront areas.

Summary: Port Royal lies adjacent to a residential canal that supports patches of mangroves, which provide important shoreline stabilization and ecological functions. While the trench alignment avoids direct entry into canal areas, driveway connections, canal paths, and stormwater runoff from unpaved roads pose a risk of indirect sedimentation and debris wash-off into the canal system, especially during rainfall events.

No trenching or excavation is planned within mangrove patches or directly at the water's edge, but site-level erosion controls, buffer zone protection, and equipment restrictions are required to prevent unintended encroachment or runoff-related degradation of water quality. These measures are consistent with the Environmental Planning and Protection Act (2019), Forestry Act (2010), and IDB's ESPS 6 on Biodiversity Conservation.

9.8.1.1 Management Measures

Action Area	Management Measure	Corrective Action if Deviations Occur	Timeline	Responsible Entity
Canal buffer protection	Maintain a minimum 20 ft buffer from mangroves and water's edge; no stockpiling or staging in buffer zone.	Remove material or machinery immediately; re-flag buffer zone and retrain crew.	Continuous during works	Contractor Site Manager; verified by WSC

Mangrove root zone avoidance	Prohibit vehicle or worker movement within root zones of canal-side mangroves.	Restrict access; record incident; report to DEPP if damage occurs.	Ongoing	Contractor
Sediment control near drainage paths	Install silt barriers, sandbags, or berms near known runoff channels leading to the canal.	Replace damaged controls; reinforce with additional sediment traps.	Pre-rainfall and weekly checks	Contractor; verified by WSC
Material storage restrictions	Store aggregates and spoil piles at least 20 ft from any surface drainage or canal pathway.	Relocate material; apply tarpaulin cover and diversion berms.	Daily during construction	Contractor
Response to water quality risk	Cease work and implement spill containment or erosion repairs if sediment or debris enters canal.	Notify WSC and DEPP; document and implement cleanup protocol.	Immediate response required	Contractor; reviewed by WSC
Worker briefings on aquatic buffers	Conduct staff briefings to talk about canal protection and prohibited activities near mangroves.	Reinforce protocols; document attendance.	Weekly or before work near buffer zones	Contractor

9.8.1.2 Monitoring, Indicators and Responsibilities

Monitoring Parameter	Indicator	Method/ Frequency	Responsible Entity
Buffer zone compliance	No disturbance or entry within 20 ft of mangrove or water's edge.	Daily inspections; photos logged if work occurs near canal.	Contractor; verified by WSC
Sediment containment near canal paths	No visible sediment runoff into canal areas or driveways leading to canal.	After rainfall and during trenching near slope edges.	Contractor; WSC spot checks
Mangrove root zone protection	No trampling, cutting, or equipment in	Weekly inspections; incident log if damage observed.	Contractor

	mangrove root zones.		
Material placement compliance	All materials >20 ft from waterfront areas.	Field checks during site visits; marked storage zones.	Contractor Site Manager
Worker awareness	Toolbox talks held weekly; attendance logs maintained.	Review records weekly; verify pre-work briefings.	Contractor; monitored by WSC

9.9 WASTE MANAGEMENT PLAN

Objective: To ensure the safe and environmentally responsible handling, segregation, storage, and disposal of all waste types generated during the construction of water mains infrastructure. The objective is to prevent pollution of land, water, or air and minimize risks to human health, wildlife, and surrounding communities. This program addresses both non-hazardous and hazardous waste streams.

Summary: This section outlines the minimum waste management standards required during construction activities under the water mains infrastructure program in Bimini. It provides clear guidance on the segregation, storage, and disposal of both hazardous and non-hazardous waste. All contractors are required to prepare site-specific Waste Management Plans (WMPs) as part of their ESMPc, aligned with the baseline requirements in this ESMP. The Waste Management component emphasizes pollution prevention, proper waste tracking, spill response, and worker training. WSC will be responsible for oversight, including monitoring contractor compliance through regular inspections and documentation review.

Types of Waste Expected:
Construction activities will generate a variety of waste types, including:

- **Non-hazardous waste:** excavated soils, vegetation debris, plastic pipe packaging, and general domestic waste;
- **Hazardous or regulated waste:** used oils and filters, spill-contaminated soils, and PPE contaminated with fuel or lubricants.

Contractors must plan for the safe handling, segregation, containment, and disposal of both hazardous and non-hazardous materials, using licensed haulers and designated disposal sites approved by the Department of Environmental Planning and Protection (DEPP).

Minimum Requirements for Contractor WMPs:
Contractor-developed Waste Management Plans (WMPs), as part of their ESMPc, must:

- Clearly describe waste types expected at their site;
- Identify waste collection points, labeled containers, and impermeable storage areas;
- Outline collection frequency, disposal methods, and final disposal locations;
- Include spill prevention protocols and response procedures for accidental release;
- Include training and supervision plans to ensure proper waste segregation and handling;
- Provide reporting templates for waste volumes, incidents, and disposal logs.

WSC will review and approve all Contractor WMPs prior to mobilization. Non-compliance will result in corrective actions, withheld payments, or suspension of works.

9.9.1.1 Management Measures

Action Area	Management Measure	Corrective Action if Deviations Occur	Timeline	Responsible Entity
Waste identification and categorization	Classify all waste generated by type and characteristics (e.g., solid, liquid, hazardous) using a site-specific system	Update WMP; retrain team; update signage	Weekly	Contractor; verified by WSC
Waste Documentation	A comprehensive record of the waste generated at each construction site must be diligently maintained, documenting the type, volume, and detailed characterization of the waste produced.	Update WMP; launch investigation on reason for non compliance retrain team;	Daily	Contractor; verified by WSC
Waste segregation and storage	Set up labeled containers for hazardous, recyclable, organic, and general waste; store on impermeable surfaces	Reorganize storage area; retrain crew; notify WSC	Daily checks	Contractor
Personnel training	Train workers to recognize, handle, and segregate different waste streams	Repeat training; maintain attendance logs	Pre-mobilization and quarterly	Contractor
Effluent and liquid waste	Collect any effluent from tools, machinery, or material washing in designated tanks; remove to approved facility	Suspend works if leaking observed; install containment systems	Continuous during works	Contractor
Disposal of hazardous waste	Store hazardous waste in secure containers; remove via licensed waste transporters	Immediate removal; escalate to WSC and DEPP if delays occur	Weekly or as needed	Contractor; verified by WSC
Domestic and C&D waste	Ensure regular pickup and transport to authorized disposal facilities	Remove accumulated waste within 48	Daily to weekly	Contractor

		hours; report to WSC		
Special/hydrocarbon waste	Use spill kits and other tools as directed by DEPP; isolate contaminated soils; record incidents and disposal method	Initiate cleanup and notify WSC within 12 hours	Immediately upon incident	Contractor; WSC oversight
Equipment decontamination	Restrict washing of machinery to designated impermeable areas with drainage controls	Cease activities; relocate washing stations	Prior to works	Contractor
Final site cleanup	Remove all containers, leftover material, and debris at demobilization; restore site	Delay project sign-off until verified by WSC	End of works at each site	Contractor; certified by WSC
Waste Disposal	No form of waste generated during the construction phase, whether it is of household or other type of waste, solid or liquid, may be incinerated, buried, or discharged into water bodies or the soil. Strict adherence to these prohibitions is mandatory.	Update WMP; launch investigation on reason for non compliance retrain team;	Daily	Contractor; verified by WSC

9.9.1.2 Monitoring, Indicators, and Responsibilities

Monitoring Parameter	Indicator	Method/Frequency	Responsible Entity
Waste segregation and container setup	Clearly labeled containers for general, recyclable, and hazardous waste	Daily visual inspection	Contractor; reviewed by WSC
Waste collection frequency	Regular removal of on-site waste to avoid buildup or overflow	Weekly checklists; daily log for active work fronts	Contractor
Hazardous waste disposal	Presence of secure storage and licensed disposal (if applicable)	Waste manifest (if generated); visual check weekly	Contractor; verified by WSC
Worker training on waste handling	Number of workers trained; records of refresher sessions	Training logbook updated quarterly	Contractor HSE Officer

Incident and spill response	Number of spill incidents and actions taken	Incident log; immediate follow-up within 24 hrs	Contractor; monitored by WSC
Site condition post-demobilization	Evidence of final cleanup; absence of residual waste	Photographic evidence and WSC inspection before sign-off	Contractor; approved by WSC

9.10 EFFLUENT MANAGEMENT

Objective: To ensure that effluent generation and disposal during construction are properly managed, avoiding contamination of soils, groundwater, or surrounding areas.

Summary: This section is not applicable to the Port Royal site, as no sanitation or equipment washing facilities will be established within the work zone. Site personnel will access designated restroom facilities located at the laydown yard. No effluent will be generated, stored, or discharged on-site. The project area's flat terrain and lack of drainage infrastructure reinforce the importance of avoiding localized wastewater accumulation.

This plan therefore applies only as a procedural safeguard to confirm that workers are informed of proper sanitation arrangements and that no greywater or blackwater discharge occurs at the construction corridor.

9.10.1.1 Management Measures

Action Area	Management Measure	Corrective Action if Deviations Occur	Timeline	Responsible Entity
Worker sanitation access	Workers will use existing restroom facilities at the laydown yard.	Remind workers of designated sanitation site; implement enforcement through daily briefings.	Continuous during construction	Contractor; verified by WSC
On-site effluent control	No portable toilets, washing, or effluent storage will be permitted at the worksite.	Stop noncompliant activity; report to WSC.	Ongoing	Contractor Site Supervisor
Equipment washing	All machinery washing will be prohibited on-site; maintenance must occur at approved off-site facilities.	Suspend activity; relocate equipment.	Ongoing	Contractor; monitored by WSC
Site inspections	Confirm no wastewater, greywater, or effluent release in active or staging areas.	Issue corrective order; re-inspect.	Weekly	WSC Field Supervisor
Chemical Toilet Placement and Installation	Install toilets on level, stable ground away from drainage lines, watercourses, stormwater inlets, and high-traffic areas.	Relocate units if placed too close to drainage or unstable areas. Re-secure or stabilize if units become unstable.	At installation; monitor weekly	Contractor; monitored by WSC

	Ensure toilets are secured to prevent tipping.			
Servicing and Waste Removal	Contract licensed waste service provider for regular pumping and cleaning. Maintain servicing logs.	Increase servicing frequency if overflows or odor issues occur. Investigate cause of inadequate servicing.	Weekly	Contractor; monitored by WSC

9.10.1.2 Monitoring, Indicators, and Responsibilities

Monitoring Parameter	Indicator	Method/Frequency	Responsible Entity
Sanitation compliance	Workers using designated restroom facilities; no unauthorized on-site use	Weekly inspections; worker briefings	Contractor; verified by WSC
Effluent absence	No pooling, runoff, or discharge observed in active or staging areas	Visual inspections after rainfall	Contractor; monitored by WSC
Equipment washing compliance	No evidence of on-site machinery washing or fluid disposal	Weekly inspections	Contractor; verified by WSC

9.11 CHEMICAL SUBSTANCES MANAGEMENT

Objective: To prevent pollution, spills and proper storage of machine fuel in compliance with national chemical safety regulations.

Summary: Contractors are required to follow strict protocols for the use and storage of chemicals on-site, particularly petroleum-based products used during equipment fueling and maintenance. Priority will be placed on safe storage, proper storage containment clear labeling, emergency preparedness, and compliance with occupational health and environmental protection standards. Training, safety data sheets, and appropriate signage must be provided and maintained throughout the construction period.

Spill procedure: This procedure outlines the steps to be taken in the event of a diesel or fuel spill to minimize risks to human health, safety, and the environment during construction activities in Port Royal. It applies to all project personnel responsible for handling, storing, or using fuel for vehicles, or construction equipment.

In the event of a spill, the first priority is to stop the source of the leak, provided it is safe to do so. This may involve shutting off valves, pumps, or engines and isolating the damaged hose, tank, or container. Personnel must immediately alert the Site Supervisor or HSE Officer and ensure that no ignition sources, such as smoking or open flames, are present within at least 100 feet of the spill area.

Once safety has been ensured, the spill must be contained to prevent fuel from entering nearby soils. Sand should be placed around the spill to create a barrier. For spills occurring on bare soil, small berms of sand or soil should be formed to limit spreading. All soil should be collected utilizing gloves and placed in sealed, labeled containers for safe disposal at the waste facilities on island. The affected area should then be cleaned and inspected to ensure no residual contamination remains before normal operations resume.

Refueling should take place only in designated, well-ventilated areas equipped with spill kits. Hoses, fittings, and tanks should be inspected regularly for leaks or wear, and any damaged equipment replaced promptly. Sand and waste bags maintained at each fuel storage and refueling location. Routine toolbox talks and EHS briefings will reinforce staff awareness and preparedness for spill response.

9.11.1.1 Management Measures

Action Area	Management Measure	Corrective Action if Deviations Occur	Timeline	Responsible Entity
Refueling protocols	Follow proper procedures for vehicle/machinery fueling (turn off engine, fire extinguisher nearby, no ignition sources, use spill trays)	Stop refueling immediately; retrain staff; report incident	Ongoing during fuel activities	Contractor Site Supervisor
Storage of fuels and chemicals	Store flammables >6m away from structures; use ventilated and labeled containers; place storage on impermeable surfaces	Relocate substances; label appropriately; conduct compliance inspection	Weekly inspections	Contractor; verified by WSC
Emergency response	Maintain emergency spill kits, fire extinguishers, and first responder training on all sites where fuel/chemicals are stored or used	Replenish kits; retrain staff; submit incident reports	Monthly review and post-incident	Contractor
Documentation and labelling	Maintain inventory of all stored chemical substances with labels and Safety Data Sheets (SDS) visible and accessible	Update logs; re-label containers; hold refresher training	Prior to mobilization and monthly	Contractor HSE Officer
Disposal of contaminated materials	Treat contaminated soil as hazardous waste and remove in coordination with DEPP per Environmental Liabilities protocols	Isolate area; conduct lab testing if required; dispose via licensed provider	Within 48–72 hours of detection	Contractor with DEPP coordination
Fuel transfer authorization	All refueling events must be logged and approved in advance by authorized personnel	Investigate any unauthorized activity; apply disciplinary action	As needed per fuel delivery	Contractor
Training and awareness	Provide training on chemical handling, PPE, emergency procedures, and incident reporting	Retrain personnel; document participation logs	Pre-mobilization and semi-annually	Contractor; monitored by WSC

9.11.1.2 Monitoring, Indicators, and Responsibilities

Monitoring Parameter	Indicator	Method/Frequency	Responsible Entity
Chemical substance compliance	% of compliance in inspections conducted on chemical substance management	Bi-weekly inspections of storage areas and chemical use logs	WSC
Training documentation	Registration forms for key personnel in chemical substance management	Prior to works and updated quarterly	Contractor HSE Officer
Chemical substance inventory and storage	Registration forms for all chemical substances stored on site	Initial inventory + monthly updates	Contractor

Transportation of Hazardous Materials Subprogram

- The Contractor shall adopt strict protocols for the safe transport and handling of hazardous materials used during construction, such as fuels, lubricants, and chemicals:
- Ensure all hazardous materials are labeled, packaged, and transported in compliance with international best practice and national regulations.
- Maintain updated Safety Data Sheets (SDS) on-site and during transport for immediate reference.
- Train personnel in spill prevention, containment, and cleanup procedures.
- Designate specific routes for the movement of hazardous materials to minimize risks to the community.
- Develop a spill response plan and ensure spill kits are available in all vehicles transporting hazardous materials.

9.12 Occupational and Community Health and Safety

- The contractor shall regularly ensure compliance with relevant standards and regulations, including international best practices.
- All personnel are required to receive training on equipment operation, machinery use, and vehicle operation in accordance with prevailing regulations within protected areas.
- Clear and permanent identification of all available elements must be conducted, alongside the use of signage and instructional materials for educational purposes.
- The contractor must supply Personal Protective Equipment (PPE) and provide comprehensive induction training to workers, covering PPE types, proper usage, characteristics, and limitations.

Occupational Health and Safety Subprogram

A comprehensive assessment of risk factors associated with each job role, including an enumeration of the workforce exposed to these risks, must be conducted. The following measures are recommended to enhance workplace safety:

- The Contractor is responsible for conducting daily 5-Minute Safety Talks before commencing work. Topics should be tailored to the specific risks associated with ongoing activities.

- The Contractor is responsible for developing and implementing Safe Work Procedures for the safe execution of activities. Emphasize adherence to established safety protocols.
- The Contractor should regularly inspect and ensure the proper functioning of equipment, machinery, and essential safety apparatus such as fire extinguishers.
- The Contractor is responsible for applying Safety Data Sheets for hazardous products, ensuring that relevant information is readily accessible to workers.
- The Contractor must provide necessary Personal Protective Equipment (PPE) to all workers on the construction site in accordance with the specific requirements of their tasks.
- The contractor shall be responsible for providing adequate portable sanitation and handwashing facilities at all active work sites to ensure proper hygiene and safeguard worker health in accordance with occupational health and safety standards.
- Workers must demarcate work areas using appropriate signalling to promote awareness and help prevent accidents.
- The Contractor and WSC must conduct proper Waste Management by exercising control over the collection, treatment, and disposal of residues and waste, while adhering to basic sanitation standards.
- The Contractor is responsible for verifying that personnel operating equipment possess the necessary licenses and certifications.
- The Contractor is responsible for training in Environmental, Health, Hygiene, and Occupational Safety.
- The Contractor is responsible for understanding the Grievance Redress Mechanism that WSC is responsible for deploying and have cards/flyers which will specify how complaints should be submitted.
- The Contractor must implement the emergency preparedness and response plan outlined in this ESMP. Maintain first aid kits and fire extinguishers at all work sites.

The WSC site supervisor and contractors must implement an emergency preparedness and response plan and WSC's hurricane preparedness plan.. Maintain first aid kits and firefighting equipment such as extinguishers at all work sites. Machinery maintenance has the potential to introduce hazards like electrical hazards (maintenance of electrical components, such as pumps, generators, or control panels, may expose workers to live circuits), and fuel hazards (spill and leaks can lead to environmental contamination, and fire/explosion risks if ignited). It is therefore classified as high-risk within the occupational context of Component 3, and require a high level of commitment to safety protocols, continuous training, and strict adherence to established guidelines to mitigate potential hazards and ensure the well-being of personnel involved.

9.12.1.1 Monitoring, Indicators, and Responsibilities

Monitoring Parameter	Indicator	Method/Frequency	Responsible Entity
PPE usage and compliance	100 % of workers properly equipped with PPE	Weekly spot checks, photo documentation	WSC Site Supervisors/Contractor
Safety talks and training	Number of daily safety talks conducted; training attendance logs	Daily toolbox talks; training logs	WSC Site Supervisors/Contractor

Emergency preparedness	Presence of functional first aid kits and emergency equipment Presence of climate and weather protocols	Monthly checks	WSC Site Supervisors/Contractor
Accidents and incidents	Number of Work accident and incident registration forms received.	Monthly	WSC Site Supervisors/Contractor
Fire Prevention Readiness	Availability and functionality of extinguishers at every active staging zone, #1 drill per month	Equipment checklists; Monthly audits, Monthly drills	Contractor HSE Officer;

Community Health and Safety Subprogram

This subprogram is designed to address potential risks and impacts on the health and safety of communities affected by the project. The key aspects to consider are:

- All workers must implement clear and effective signalling and delineation measures at work sites to enhance safety and minimize potential hazards.
- If hazardous materials are to be used during activities, rigorous management and safety protocols should be in place to prevent any harm to the health and safety of the communities.
- The Contractor is responsible for the development and implementation of a comprehensive emergency preparedness and response plan, ensuring swift and effective actions in the event of unforeseen circumstances.

The Contractor is expected to integrate these measures into the project's execution, reflecting a commitment to responsible and conscientious project management.

Labor Management Procedure (LMP) Subprogram

The primary objective of the LMP is to establish and maintain employment relationships grounded in the principles of equal opportunities and equitable treatment. The employment of child or forced labor is strictly prohibited. The WSC, contractor, along with its subcontractors, are expressly prohibited from engaging individuals below the minimum age of employment as prescribed by relevant legal statutes, with a minimum threshold of no less than 15 years of age.

The LMP will include the creation of a grievance redress mechanism. This mechanism is designed to provide a channel through which workers, and where applicable, their affiliated organizations, can voice concerns related to the workplace. Additionally, it serves as a platform for the lodging of complaints pertaining to instances of sexual and gender-based violence. The contractor is tasked with ensuring the effectiveness and accessibility of this grievance redress mechanism to facilitate a transparent and responsive resolution process.

The WSC and contractors shall develop and implement the code of conduct and provide training for its knowledge and understanding. See Appendix A for the proposed content of the code of conduct. This Code is aimed at ensuring respectful and harmonious ties in the workplace in which the Program and its

projects are developed in such a way as to ensure a work environment free of discrimination and/or violence based on gender, gender identity, sexual orientation, cultural identity, religion, ethnic or national origin, trade union membership, disability or any other discrimination typified in current legislation.

9.12.1.2 Monitoring and Compliance

Indicators	Description	Responsibility
Number of workers with Medical and Labor Insurance	Total number of workers in the project	WSC Social Specialist/Contractor
Grievances received	Monthly report on number of grievances received and attended	WSC Social Specialist
Code of Conduct signed	Code of conduct signed by all workers	WSC Site Supervisor/Project Manager/Social Specialist/Contractor

Protection of Community Critical Infrastructure Subprogram

For all works under the Program, the following measures will be implemented to protect sensitive receptors in the area of works (such as hospitals, schools or residents):

- **Identification and Mapping**: Clearly identify and map all sensitive receptors in the project area, including hospitals, schools, and residences.
- **Communication and Notification:** Inform affected communities and institutions about the project timeline, potential impacts, and planned mitigation measures. Provide regular updates through community meetings, flyers, and digital platforms.
- **Noise and Vibration Control:** When applicable, implement noise barriers and schedule noisy activities during less sensitive times (e.g., avoiding school hours and hospital visiting hours). Use low-vibration equipment and techniques to minimize disturbances.

Protection Measures for Historical Sites Subprogram

For all works under the Program, the following measures will be implemented to protect historical sites:

- **Identification and Documentation:** Conduct thorough surveys to document all historical sites within the project area.
- **Physical Protection Measures:** Install protective barriers around historical sites to prevent accidental damage during construction. Restrict construction activities within a defined buffer zone around each site.
- **Monitoring and Reporting:** Regularly monitor the condition of historical sites throughout the construction process. Document any changes or damages and report them to relevant authorities.
- **Stakeholder Engagement:** Involve local heritage organizations and community groups in the planning and monitoring process. Provide opportunities for stakeholders to give input on protection measures.
- **Training and Awareness:** Train construction personnel on the importance of preserving historical sites and the specific measures in place. Raise awareness among workers about the cultural significance of these sites.

To minimize risks related to the spread of communicable diseases, particularly influenza and other respiratory illnesses, the Contractor shall enforce preventive health and hygiene measures for all workers:

- Ensure all workers' hygiene practices are compliant with national regulations.
- Provide handwashing stations with soap and clean water at worksites and ensure their regular maintenance.
- Encourage and enforce the use of facemasks in situations where close contact is unavoidable.
- Conduct awareness sessions for workers on respiratory hygiene, handwashing practices, and reporting symptoms early.
- Implement policies to ensure that sick workers are not required to report to work, thereby reducing the risk of workplace transmission.
- Regularly clean and disinfect high-contact surfaces and shared tools or equipment.

9.13 TRAFFIC AND PEDESTRIAN MANAGEMENT

An assessment of the vehicular and pedestrian traffic needs to be first completed. Then the Contractors will prepare the Traffic and Pedestrian Management Program. Consultation with key stakeholders will be conducted in accordance with ESPS#10. The Contractors will ensure implementation of this Program.

The Traffic and Pedestrian Management Program shall:

- Notify communities about upcoming works
- Identify the sensitive location (religious facility, educational facility, heath facility, commercial areas) along the site access roads.
- Identify the road condition, traffic congestion areas and peak traffic load period.
- Identify the traffic hotspots like road junctions, market areas, school areas.
- Provision of traffic marshal (signal person) in identified traffic sensitive locations.
- Identify any major road repairing requirement along the site access road.
- Prepare the Traffic and Pedestrian Management Program based on local sensitivity (religious gathering, school timing, market timing and peak traffic timings);
- Implement procedure to follow road safety requirements by the drivers & helpers.
- Implement procedure to check fit certificates of the vehicles to minimize the emission of air and noise.
- Monitor road conditions to identify any damage of road or structures and remedy immediately to reduce the potential for significant impacts to the local communities.

Contractors will provide instructions to drivers to maintain the speed as per Traffic and Pedestrian Management Program.

Contractors will provide induction/training to all drivers for safe driving. Contractors will require drivers to follow all legal and project related safety requirements applicable in respect of road safety.

9.13.1.1 Monitoring and Compliance

Indicators	**Monitoring Measure**	**Responsible Entity**
Number of work fronts marked with signs in accordance with the approved Traffic and Pedestrian Management Program /Number of work fronts that require signage in accordance with Traffic and Pedestrian Management Program.	Weekly inspections/Monthly inspections	Contractor; reviewed by WSC

Number of road accidents.	Road safety accident records	Contractor; reviewed by WSC

9.14 PEST AND VECTOR CONTROL

Objective: To prevent the spread of disease, minimize environmental health risks, and ensure clean and sanitary construction sites by managing pests and vectors such as rodents, insects, and snakes. This program outlines responsibilities and required actions to reduce infestations, particularly those caused by poor waste management and stagnant water.

Summary: Port Royal's canal-side location and presence of manicured vegetation increase the risk of pest issues such as mosquitoes, rodents, and insects, particularly after rainfall or improper waste handling. Construction activities must actively manage stagnant water, food waste, and green debris to reduce vector attraction. Contractors are required to implement basic pest prevention measures and coordinate with certified pest control providers if infestations occur. These actions are essential to protect worker and community health during trenching and installation works.

9.14.1.1 Management Measures

Action Area	Management Measure	Corrective Action if Deviations Occur	Timeline	Responsible Entity
Waste management	Prompt removal of waste containers and green debris; monitor for rodent activity and signs of infestation	Increase collection frequency; apply additional control measures	Daily waste check	Contractor
Municipal coordination	Collaborate with municipal or local sanitation teams to prevent vector migration from adjacent neighbourhoods	Document communication; implement joint actions if needed	Weekly during construction	Contractor; reviewed by WSC
Food handling protocols	Ensure food waste is securely disposed of; avoid open food or ash that may attract rodents, snakes, or pests	Enforce crew training and penalties for non-compliance; secure food storage areas	Daily inspections	Contractor Site Supervisor

9.14.1.2 Monitoring, Indicators, and Responsibilities

Action Area	Management Measure	Corrective Action if Deviations Occur	Timeline	Responsible Entity
Waste management	Prompt removal of waste containers and green debris; monitor for rodent	Increase collection frequency; apply additional control measures	Daily waste check	Contractor

	activity and signs of infestation			
Municipal coordination	Collaborate with municipal or local sanitation teams to prevent vector migration from adjacent neighborhoods	Document communication; implement joint actions if needed	Weekly during construction	Contractor; reviewed by WSC
Food handling protocols	Ensure food waste is securely disposed of; avoid open food or ash that may attract rodents, snakes, or pests	Enforce crew training and penalties for non-compliance; secure food storage areas	Daily inspections	Contractor Site Supervisor

9.15 SOCIO-ENVIRONMENTAL TRAINING FOR CONSTRUCTION PERSONNEL

Objective: To ensure that all construction personnel are equipped with the knowledge, awareness, and behavioral standards required to protect the environment, maintain occupational safety, and uphold respect for human rights, gender equality, and community safety during project implementation.

Summary: To conduct the training process, informative sessions will be conducted prior to the commencement of work and as needed throughout project duration. Trainings must cover environmental management, health and safety protocols, familiarization and adherence with the organization's Code of Conduct, the Project's General GRM and Worker's GRM and addressing gender-related issues (Sexual Exploitation and Abuse (SEA) and Prevention of Gender-Based Violence (GBV)). These activities will be monitored, logged and reported in monthly reports to the WSC for compliance verification.

9.15.1.1 Management Measures

Action Area	Management Measure	Corrective Action if Deviations Occur	Timeline	Responsible Entity
Pre-mobilization Training	Deliver environmental, health, and safety training to all site workers before mobilization.	Delay work start until training is completed.	Pre-construction	Contractor; verified by WSC
Quarterly Refreshers	Conduct training sessions on safety, environmental compliance, SEA/GBV, and emergency procedures.	Schedule make-up sessions; reinforce via toolbox talks.	Quarterly	Contractor; verified by WSC
Gender-Based Violence (GBV) Training	Provide GBV prevention sessions that include protocols for reporting, support, and zero-tolerance enforcement.	Retrain staff; address specific incidents with targeted training.	Yearly and/or post-incident	WSC
Code of Conduct Awareness	All workers must receive and sign the Code of Conduct addressing SEA,	Retrain workers and enforce disciplinary actions if breached.	Pre-mobilization and onboarding	WSC Social Specialist

	non-discrimination, safety, and behavior.			
Records and Evaluation	Maintain detailed training logs, attendance sheets, and evaluation reports after each session.	Submit missing documentation; revalidate participation.	Ongoing	Contractor

9.15.1.2 Monitoring, Indicators, and Responsibilities

Monitoring Parameter	Indicator	Method/Frequency	Responsible Entity
Training Participation	Percentage of personnel trained in accordance with the Training Program	Review of attendance logs and monthly reports	WSC Project Manager/Social Specialist
Training Coverage	Percentage of training sessions given out of total required sessions	Comparison of sessions conducted vs. sessions planned	WSC Project Manager/Social Specialist
SEA/GBV Protocol Implementation	Compliance with SEA/GBV protocols, including reporting, support, and grievance mechanisms	Review of documented SEA protocols, grievance logs, and resolution timelines	WSC Project Manager/Social Specialist/Contractor
Code of Conduct Acknowledgement	Percentage of workers who signed the Code of Conduct	Review of signed acknowledgment forms and personnel files	WSC Project Manager/Social Specialist

9.16 Disaster Risk Management and Emergency Response

Objective: To ensure that construction activities under Component 3 are resilient to natural hazards and emergencies, safeguard workers and the surrounding communities, and do not obstruct local emergency operations. This program supports hazard monitoring, preparedness, and emergency coordination in line with national disaster frameworks and local disaster committees.

Summary: Bimini's flat terrain, low elevation, unpaved roads, and lack of formal drainage infrastructure make it highly vulnerable to stormwater pooling, erosion, and access disruptions during heavy rainfall or tropical storm events. Climate-related risks such as saltwater intrusion, extreme rainfall, and heat waves also threaten workforce safety and project timelines. This Disaster Risk Management and Emergency Response Plan provides site-level operational safeguards, early warning triggers, and escalation procedures to mitigate and respond to these risks. It applies to all works in the direct and indirect area of influence of the project and emphasizes pre-storm preparedness, flood-safe staging, fire and heat response, and emergency coordination with local agencies (e.g., DEPP, DRA, Ministry of Works).

9.16.1.1 Management Measures

Action Area	Management Measure	Corrective Action if Deviations Occur	Timeline	Responsible Entity
Hazard Monitoring	Monitor Met Office, DRA, and global alert systems; activate storm protocol for any severe weather advisories.	Suspend works immediately; secure equipment and excavations; notify staff.	Daily (especially May–Nov)	Contractor Site Lead; WSC Field Supervisor
Flood Preparedness	Identify or establish elevated staging zones in advance; do not store materials in low-lying or compacted areas prone to pooling.	Relocate materials within 6 hrs of forecast; restrict access to flood-affected zones.	Pre-storm & post-rainfall	Contractor; WSC Operations Team
Fire and Heat Risk Response	Install fire extinguishers in all staging areas; post heat advisory signage; provide water stations and shaded zones.	Replace missing equipment; restrict strenuous activity during heat advisories.	Weekly checks	Contractor HSE Officer; WSC
Emergency Preparedness	Maintain updated emergency contact lists and evacuation routes; conduct safety briefings quarterly.	Retrain staff; reschedule drills; update contact logs.	Quarterly	Contractor; Verified by WSC
Asset & Equipment Protection	Secure or tie-down loose materials; cover trenches pre-storm; anchor light equipment; store fuel above-ground.	Implement emergency securing protocols; document storm losses.	Continuous	Contractor Logistics Lead; WSC
Access and Mobility Safeguards	Maintain open road shoulders and at least one accessible corridor for emergency vehicles and utilities.	Reroute traffic; implement temporary road plates or bypass detours.	Daily	Contractor Site Supervisor; WSC Field Staff
Incident Response Protocol	Report environmental, health, or safety incidents within 24 hours; maintain an incident and corrective action log.	Investigate cause; apply remedial actions; submit incident report to WSC and IDB if required.	Within 24 hrs of incident	Contractor (NP); WSC (Bimini, Abaco)

9.16.1.2 Monitoring, Indicators, and Responsibilities

Monitoring Parameter	Indicator	Method/Frequency	Responsible Entity
Emergency Readiness	Availability of updated contact list, evacuation maps, and quarterly safety briefings	Log review; Quarterly safety audit	Contractor; Verified by WSC
Hazard Suspension Compliance	% of severe weather alerts where works were suspended and sites secured	Incident logs; Site inspections post-storm	Contractor Site Lead; WSC
Flood Prevention Measures	Pre-storm relocation of materials and proper site drainage setup	Site walkovers pre- and post-rainfall	Contractor; WSC Site Supervisor
Fire Prevention Readiness	Availability and functionality of extinguishers at every active staging zone	Equipment checklists; Monthly audits	Contractor HSE Officer; WSC
Heat Risk Safeguards	Presence of shade, hydration stations, and heat signage in open work areas	Weekly observation report	Contractor HSE; WSC
Access Route Availability	Unobstructed travel lane or alternative access maintained along Port Royal residential roads to ensure continuous movement for residents, service vehicles, and emergency access during construction.	Daily field checks and construction layout logs	Contractor; WSC Field Operations
Incident Reporting & Logging	All safety/environmental incidents logged, investigated, and closed within 48 hours	Review of logbook; Corrective action report	Contractor; Verified by WSC and IDB

Life and Fire Safety Subprogram

- The Contractor shall assess the risk of fire hazard within the project activities
- A plan should be then developed and enforced on protocols to prevent and respond to fire hazards, particularly those associated with the storage and handling of flammable materials such as oily rags, solvents, or fuels. The following measures shall be implemented:
- Collect and dispose of oily rags and similar waste in sealed, fire-resistant containers at the end of each work shift.
- Prohibit the accumulation of flammable waste in work areas and storage zones.
- Ensure fire extinguishers and firefighting equipment are strategically placed, clearly marked, and inspected regularly.
- Provide training to workers on fire prevention, emergency response, and safe handling of flammable materials.
- Incorporate fire hazard awareness into daily toolbox talks and emergency drills.

9.17 COMMUNITY INFORMATION AND PARTICIPATION

Objective: To ensure timely, transparent, and inclusive communication between the WSC, project contractors, and all affected communities.

Socio-environmental effects to be prevented or corrected: Misinformation of the public regarding the progress and tasks of the project.

The identified stakeholders for Component 3 include but are not limited to:

- Residential property owners and tenants in project areas
- Businesses, especially water-intensive operations (hospitality, laundromats, restaurants)
- Community institutions (churches, schools, clinics)
- Local government and district councils
- Tourism operators and industry associations
- Civil society organizations and non-governmental organizations (NGOs)
- Vulnerable or marginalized groups, including elderly residents, persons with disabilities, and low-income households

9.17.1.1 Management measures

WSC's Responsibilities:

Project Reporting: Collect and maintain timely and updated records on the project's implementation and progress in New Providence and Family Islands.
Community Information and Participation: Implement the Community Information and Participation Program consistently throughout the project's lifecycle. Give special attention to ensuring clear, transparent, and timely communication with all individuals benefiting from the program.
Communication Channels: Provide the public with a transparent and accessible means of communication. Establish and implement a Grievance Redress Mechanism. Make available a 24-hour contact telephone number, an email address for the community to submit their claims, complaints, and suggestions. Ensure that all submitted comments are promptly analyzed and receive a swift response.
Access to Information: Facilitate equal access to information, with a commitment to promoting gender equity among all interested social sectors. These responsibilities underscore the contractor's commitment to effective communication, community engagement, and transparency throughout the project.
Community Engagement: Establish a mode of engagement with the community affected by the project's development. Inform the community about the project's schedule and progress to foster transparency.

Key Information to be shared with stakeholders through the Programs Communication Management Consultancy:

- Project purpose, benefits and scope of works
- Locations and schedules for installation activities
- Potential short-term social and environmental impacts (ex. Temporary water disruptions, property access, noise)
- Social and environmental mitigation measures
- Waste management
- Procedures for lodging complaints or feedback via the **Grievance Redress Mechanism (GRM)** and general modes of communication should also be covered

Contractor's Responsibilities:

Project Reporting: Maintain timely and updated records on the project's implementation and progress.
Communication Channels: Provide information to users, if needed, regarding contact information (telephone number, an email address) for submitting their claims, complaints, and suggestions.

9.17.1.2 Monitoring and Compliance

Indicators	Description	Responsibility
Community meetings/town halls	List of attendees from meetings/town halls, records of communication channels used for project information Before work starts in each community; mid-project updates	WSC
Flyers and door-to-door notices	Provide advance notice of installation or disruptions At least 48 hours before activity	WSC
Grievance Redress Mechanism	Percentage of complaints managed properly during the month according to the defined mechanism over the total number of complaints generated.	WSC
Social media posts (WSC accounts)	Real-time updates, photos, schedule changes, Central reference point for all information Continuous, updated weekly	WSC

9.18 COORDINATION WITH SERVICE PROVIDERS

9.18.1.1 Management Measures

The Contractor will establish coordination with utility service providers to address the interferences that the execution of the Work will cause with existing infrastructure. To comply with this, and with the agreement of the Site Inspection, they will plan and propose the most appropriate solution and reach consensus with the respective company responsible for executing it, minimizing inconvenience to users. Additionally, actions will be scheduled so that the Contractor promptly resolves any unforeseen interference that may jeopardize service provision.

From the start of the project, the Contractor will manage the appropriate permits, coordinating with the technical teams of the service providers. The Contractor shall inventory existing public utility networks in accordance with the contract specifications and plans to identify and locate lines that may be affected.

Each utility company shall appoint a coordinator to attend project oversight committees, ensuring cordial management of all expansion, repair, or replacement work within the project intervention area. If removal or relocation of structures is required, the Contractor shall first locate public utility lines within the construction area, as indicated by the project design plans and information provided by the utility companies. Simultaneously, approval of the plans by the respective utility companies shall be obtained.

9.18.1.2 Monitoring and Compliance

Indicators	Monitoring Measure	Responsible Entity
Number of network service interruptions caused by construction activities with interferences / Number of network service interruptions caused by construction activities with interferences coordinated with network service providers.	Daily inspections and logs	WSC Site Supervisor/Contractor

9.19 ENVIRONMENTAL LIABILITIES PROGRAM

Objective: To ensure that any pre-existing environmental or social liabilities within the project's direct work zone are identified, documented, and appropriately addressed prior to excavation, trenching, or material staging. This includes the detection and management of contaminated soils, hydrocarbons, legacy construction waste, and informal waste deposits that may pose risks to human health, groundwater, or surrounding vegetation. The program also considers environmental vulnerabilities such as flood-prone depressions and erosion-prone soils that could worsen if unaddressed.

Summary: Preliminary site observations in the Port Royal community, including the access road leading up to the community, identified compacted sandy soils, localized water pooling in depressions, and minor informal waste accumulation near roadside verges and private driveways. While no known contamination was identified, these conditions may pose environmental risks during trenching. Prior to mobilization, contractors must conduct a site walkthrough to identify and document any legacy waste, hydrocarbon stains, or drainage issues. All findings must be logged and addressed through safe removal, stabilization, or reporting to WSC and DEPP if necessary. Site clearance must be confirmed before excavation begins to ensure a clean, hazard-free work zone.

9.19.1.1 Management Measures

Action Area	Management Measure	Corrective Action if Deviations Occur	Timeline	Responsible Entity
Site Condition Screening	Conduct a visual inspection with photographic documentation to confirm absence of contamination, legacy waste, or informal encroachments.	Escalate to WSC Environmental Officer if unanticipated concerns are identified.	Prior to mobilization	Contractor; verified by WSC
Risk Flagging and Documentation	Use a standardized checklist to flag and document any unanticipated issues (e.g., buried debris, stained soils, or dumped materials).	Pause site activity in affected zone; initiate internal review process.	Ongoing during mobilization	Contractor
Contingency Action (if needed)	If risks are flagged, engage third-party specialist for sampling, classification, and safe removal/disposal per Waste and OHS protocols.	Implement site-specific Remediation Action Plan (RAP) if required.	Before excavation in flagged areas	Contractor; WSC Environmental Unit
Site Clearance Confirmation	Maintain site logbook confirming cleared status of each zone prior to excavation. Use photo evidence and signed forms.	Site cannot proceed to trenching until zone is verified "clear".	Pre-excavation per zone	Contractor; approved by WSC

9.19.1.2 Monitoring, Indicators, and Responsibilities

Monitoring Parameter	Indicator	Method/Frequency	Responsible Entity
Environmental Liability Status	% of work areas verified as free of legacy risks or liabilities	Pre-mobilization screening and visual inspection	Contractor; verified by WSC
Risk Documentation and Reporting	Number of unexpected issues identified and documented	Incident log, photo record, and weekly report	Contractor
Response to Unexpected Liabilities	Response time to investigate and manage flagged environmental risks	Within 48 hours of identification	Contractor; escalated to WSC
Site Clearance Validation	Signed logbooks and pre-excavation photo evidence submitted per site	Weekly validation prior to trenching activities	Contractor; reviewed by WSC

9.20 CHANCE FIND PROCEDURE

9.20.1.1 Management measures

This program will be systematically implemented throughout the duration of the project, with the following key provisions:

Continuous Monitoring: A permanent monitoring initiative will be conducted across the entire area directly impacted by the project to identify any archaeological elements.

Immediate Action on Discovery: Should any property of potential archaeological significance be discovered; the construction team is obligated to promptly cease activities that may impact the identified area. Adequate surveillance measures will be implemented to prevent unauthorized access and looting.

Alternative Worksite Consideration: If necessary, the project team will explore alternative locations for project activities to mitigate any potential impact on archaeological finds.

Notification of Competent Authority: The relevant national authority will be promptly notified, and the project will adhere to their instructions for further action in response to the archaeological discoveries.

Salvage Operations: In the event of cultural remains emerging during activities such as ditching, earth removal, or excavations, salvage operations will be promptly initiated. Recognized archaeologists, under supervision, will conduct these operations with the utmost consideration for preserving the contextual integrity of the archaeological remains. Work will resume only upon the archaeologist's determination of an appropriate timeframe and location.

Comprehensive Reporting: Upon completion of the project, a comprehensive final report will be prepared. This report will detail the quantity and nature of the recovered materials and will be submitted to the competent authority.

Consultation with Competent Authority: The competent authority will be consulted regarding the proper procedures for delivering archaeological materials as part of the project's commitment to compliance and transparency.

9.20.1.2 Monitoring and Compliance

Indicators	Monitoring Measure	Responsible Entity
Number of archaeological and cultural resources found in the project and managed according to the defined procedures / Number of archaeological and cultural resources found in the project.	Daily inspections and logs	WSC Site Supervisor/Contractor

9.21 WORKS CLOSURE

Objective: To ensure that all construction sites under Component 3 are systematically decommissioned in a manner that eliminates environmental liabilities, restores ecological and community conditions, and leaves no residual impact upon completion of works.

Summary: Closure of construction sites in Bimini must be executed with care to avoid leaving behind physical waste, safety risks, or unresolved environmental and social liabilities. Contractors must follow proper dismantling, waste removal, and site restoration protocols. Sites must be returned to a stable and aesthetically acceptable condition, with all cleared vegetation replaced and no legacy issues left unresolved. Photographic documentation before and after works is mandatory to support closure verification.

9.21.1.1 Management Measures

Action Area	Management Measure	Corrective Action if Deviations Occur	Timeline	Responsible Entity
Site Systematic Removal	All project installations must be removed systematically and completely post-works.	Notify contractor; delay closure sign-off until resolved.	At demobilization	Contractor; verified by WSC
Final Environmental & Social Review	Conduct a final review to identify and remediate unresolved liabilities.	Correct issues identified; submit updated closure plan.	End of works per site	Contractor with WSC oversight
Waste Disposal	Dispose of waste per SESMP guidelines using approved disposal facilities.	Submit disposal manifests; withhold final payment if violations occur.	Continuous during dismantling	Contractor
Vegetation Restoration	Replant with original/native species	Require replanting and	Within 2 weeks of site closure	Contractor; monitored by WSC

	in cleared or disturbed zones.	photo evidence of survival.		Environmental Officer
Site Appearance and Integration	Restore site to a clean, safe, and natural condition. No visible waste or infrastructure remnants.	Delay closure approval until standard met; require cleanup.	Final site inspection	Contractor; validated by WSC Inspector

9.21.1.2 Monitoring, Indicators, and Responsibilities

Monitoring Parameter	Indicator	Method/Frequency	Responsible Entity
Final Site Restoration	Absence of claims or complaints from community, local government, or regulators	Post-closure inspections; stakeholder confirmation	Works Director
Visual Closure Evidence	Photographic records of sites before and after dismantling	Site-by-site review at end of works	Works Inspector

9.22 Operational Environmental and Social Management Plan

This plan outlines the mitigation measures designed to address potential adverse impacts and risks during the operational and maintenance phase of the projects' implementation.

Throughout the operational phase, the WSC will assume responsibility for the operation and maintenance of the infrastructure, following the prescribed guidelines provided herein.

Table 11. Operational SESMP requirement for the Bimini Port Royal Water Mains Project.

ESMP Programs	Access to Piped Water Supply
Waste Management Program	x
Occupational Health and Safety Program	x
Grievance Redress Mechanism	x
Capacity Building Program for WSC Personnel	x
Contingency Plan	x
Socio-Environmental Training Program	x
Road Safety and Traffic Management Program	x

Plan/Program	Impact to Avoid	Minimum Mitigation Measures	Responsible Party	Indicators and Compliance Records	Supervision
Waste Management Program	Contamination due to inadequate management of waste.	Development and implementation of a Waste Management Program	WSC	Environmental Audit of the Site	DEPP
Occupational Health and Safety Program	Occupational risks due to the operation and maintenance of infrastructure	Compliance with current national regulations and international best practices	WSC	-Frequency Index (number of accidents x 200,000/person-hours worked in the period). -Severity Index (number of serious accidents x 200,000/person-hours worked in the period). -Fatal Accident Incidence Rate (Number of fatal accidents x 200,000/Number of exposed workers).	WSC/ DEPP
Grievance Redress Mechanism	Impacts on local community and workers of the work for the non-attention to the claims and complaints.	There must be an efficient tool for receiving, registering, monitoring, and resolving claims.	WSC	Registration of claims and complaints	DEPP
Capacity Building Program for WSC Personnel	Lack of knowledge on new equipment and systems to be in place.	Minimum training: - Introduction to SCADA Systems and AMI - Operation of SCADA, DMAs and AMI - SCADA and AMI Data Management and Reporting	WSC	Percentage of operators trained according to Training Program Training Registration Sheets	WSC

Contingency Plan	Poor management of environmental/occupational contingencies	**Strategic Plan** Define the structure and organization for emergency response, the roles and responsibilities of the people in charge of executing the plan, the necessary resources, and the preventive and operational strategies to be applied in each of the possible scenarios, defined from the evaluation of the risks associated with construction. **Action Plan** Establish the procedures to be followed in case of emergency.	WSC	Number of environmental and safety accidents managed according to the defined procedure / Total number of environmental and health accidents occurring in the project.	WSC/DEPP
Socio-Environmental Training Program	Lack of knowledge regarding the personnel's role in preserving, protecting, and conserving the environment, as well as ensuring occupational safety in the performance	Training on waste management, contingency plans, use of PPE, spill prevention and management, effective sludge handling, fire safety protocols, and environmental regulations and compliance.	WSC	Percentage of personnel trained in accordance with the Training Program.	WSC/DEEP
Road Safety and Traffic Management Program	Accidents and incidents that affect occupational and community health and safety	Identify sensitive locations, implement road safety requirements, implement procedures of marking work fronts	WSC	-Number of road accidents -Number of work fronts with signs/Number of work fronts that require signs	DEPP

9.23 BUDGET FOR IMPLEMENTATION OF THE ESMP

The table below includes the estimated costs, schedules, and responsible entities for the implementations of the ESMP.

Measure	Description	Estimated Cost	Schedule	Responsible
Implementation of Mitigation Measures and Programs of Construction ESMP	Preparation of the ESMP at the construction level and implementation during the construction of the project; socio-environmental monitoring of the works.	1.5% of the total cost of the Project	From the beginning of the works, until their finalization	Contractor

The cost for the implementation of the ESMP mitigation measures and programs is indicative and does not constitute a prescriptive element of contractual obligation. The implementation of the ESMP is monitored exclusively in terms of its performance (results) and not based on the inputs used (resources expended by the contractor).

10 CONCLUSIONS

Throughout the works of these characteristics, there are potential impacts and risks, mainly in the construction phase, such as negative impacts due to the risk of occupational accidents during the works, air pollution due to emissions from vehicles and machinery affected by the work, noise and vibrations, risk of soil and water contamination due to accidental spills, risk of soil erosion and sediment runoff, and risk of contamination due to poor management of the solid waste generated.

These negative impacts of the construction phase are limited in time, occur during the work period, and affect only the direct area of influence of the projects. The application of adequate mitigation measures previously detailed along with the application of good construction practices that guarantee compliance with national regulations, and the IDB Environmental and Social Performance Standards, ensures that these measures objectively will mitigate all the identified impacts and risks.

In the operational phases, the project is expected to yield long-term positive impacts on communities by providing enhanced access to potable water. This will contribute to an improved quality of life for residents and visitors alike. Therefore, the operation is considered feasible, without significant negative socio-environmental risks or impacts that cannot be mitigated.

11 ANNEX 1: LABOUR MANAGEMENT PROCEDURE (LMP)

Introduction

The purpose of this Labor Management Procedure (LMP) is to establish the scope and application of ESPS 2 "Labor and Working Conditions" for the BH-L1061 Program.

The Labor Management Procedure will be managed as part of the Environmental and Social Management Plan (ESMP). The requirements included in the LMP will be systematically integrated into the legal requirements of the Program, the tender documents and the contracts of the contracting companies and suppliers.

The LMP is a dynamic document and should therefore be revised and updated as necessary during the life cycle of the Program.

The LMP presents the guidelines, guidelines and minimum contents for the labor management and working conditions of the works of the Program to be fulfilled by the main contractor, the companies involved and the executing agency. The responsibility for ensuring compliance with this procedure shall be the responsibility of EA.

The LMP is governed by the principles of equality, opportunity and fair treatment ensuring that no employment decisions will be made based on personal characteristics outside the requirements inherent to the job, refraining from discrimination in any aspect of the employment relationship, such as recruitment and hiring, remuneration (wages and benefits), working conditions and terms of employment, access to training, job assignment, promotion, dismissal or retirement and disciplinary practices. Measures shall be taken to prevent and address violence, harassment, intimidation, or exploitation, especially regarding women, persons of diverse sexual orientations and gender identities, persons with disabilities, and migrant workers. Under no conditions shall child or forced labour be permitted.

A safe and healthy work environment shall be ensured, considering the risks inherent in the Program and specific hazards for women, persons of diverse sexual orientations and gender identities, elderly persons, persons with disabilities, children (of working age, in accordance with this Performance Standard), and migrant workers. Measures shall also be taken to prevent accidents, injuries and illnesses that may arise from, be associated with, or occur during work, minimizing, to a reasonable extent practicable, the causes of hazard factors.

Scope of the Labor Management Procedure (LMP)

Environmental and Social Performance Standard 2 "Labor and Working Conditions" of the IDB's Environmental and Social Policy Framework pursues the following objectives:

Respect and protect the fundamental principles and rights of workers.

Promote fair treatment, non-discrimination, and equal opportunities for workers.

Establish, maintain, and improve relations between workers and the employer.

Ensure compliance with national legislation on employment and labor.

Protect workers, including those in vulnerable situations, such as women, persons of diverse sexual orientations and gender identities, persons with disabilities, children (of working age, in accordance with this Performance Standard) and migrant workers, workers hired by third parties and workers in the main supply chain.

Promote safe and healthy working conditions and promote workers' health and prevent the use of child labour and forced labour (as defined by the ILO).

This standard applies to:

- **Direct workers**: are persons employed or hired directly by the borrower to work specifically in relation to the Program. The direct worker is employed or hired by the borrower, is paid directly by the borrower, and is subject to the borrower's instructions and day-to-day control.
- **Contract workers**: Persons engaged through third parties to perform work related to core functions of the Program for a considerable period of time where that third party exercises continuous control over the work, working conditions and treatment of the worker in relation to the project.
- **Main supply chain workers**: Workers in the main supply chain, provides goods and materials to the project, where the supplier exercises control over this worker for the work, working conditions and treatment of the worker.

Where public employees are working in connection with the Project on either full-time or part-time basis, they will be subject to the terms and conditions of their existing public sector employment agreement or arrangement, unless their employment or hiring has been effectively legally transferred to the Project.

Requirements relating to gender equality and stakeholder participation (including a grievance mechanism) should also be considered in the implementation of this Performance Standard in accordance with ESPS 9 and 10. In no case and under no circumstances shall child and forced labor be permitted.

Description of the Project's Workforce.

Identification and characterization of workers involved in the project:

Depending on the activities foreseen in the project, it is estimated that the organization of the workforce involved will be as follows:

1. **Direct workers**: In accordance with the organizational structure foreseen for this Program, it is considered that the direct hiring of personnel under the modality of contracting services will be coordinated by WSC and are mostly linked to the hiring of personnel to carry out the supervision and technical inspections (environmental and social) of works.
2. **Project workers**: It is expected that the largest number of staff will be employed under this category. The contracting companies will conduct the construction works foreseen for each project.
3. **Workers in the main supply chain**: Personnel employed by the companies supplying inputs and infrastructure linked to the works foreseen by the Program. The Program must conduct due diligence to ensure that inputs produced under conditions of forced labor are not procured and that the working conditions of suppliers comply with current regulations with their personnel.

Table 45. Summary Table of Type of Workers Linked to the Project

Type of Worker	Characteristics
Direct Workers	Individual Consultants directly hired by the Program
Contract workers	Workers hired by the contracting firms hired by the project. It is expected by the type of works that the largest number of people involved in the Program be incorporated under this modality of contracting.
Primary Supplier Workers	The number of workers to be hired under this modality and the specific characteristics will be information provided by the contractor awarded the work.

Assessment of possible occupational hazards

Depending on the activities to be conducted by the staff in the project, the main risks for each of the most relevant jobs must be identified.

The existing risks involve adopting measures for the prevention of accidents and incidents with the development of safe working methods, with a correct choice and training of personnel to perform such work, in addition to using the appropriate tools and personal protection elements (PPE).

The following table provides a summary of the main activities, with the possible risks identified and those responsible.

Table 46. Example of activities and risks identified in the project

Activity	**Location**	**Risks Identified**	**Responsible**
Planning, design, execution and implementation, evaluation, and monitoring of Projects	Office: WSC	No specific and significant risks are identified. Risks related to occupational health and safety in internal environments (ergonomic risks, accidents, stress, mental load, psychophysical factors)	WSC
Train, inform and raise awareness especially among construction personnel both orally and in writing about the expected environmental and social problems, the implementation and control of environmental and social protection measures and the specific and relevant aspects applicable to the execution of projects in accordance with current	Workshops/Office	No specific and considerable risks are identified if the facilities of the workshops comply with current regulations. Possible risks linked to occupational health and safety in internal environments (accidents, stress, mental load, psychophysical factors).	Contractor (Environmental and Social Manager)

environmental and social regulations and regulations. Conduct gender-sensitive training and code of conduct for all contracted personnel, including the management staff of the contractor company. Have updated the technical file of the personnel with the training conducted and the elements of security and personal protection delivered			
Conducting interventions for improvement of water and sewage systems	[Project Locations]	Specific risks are identified that can be avoided with the corresponding security measures and protocols. **In workshops and place of work**: • Risks of gender-based violence • Occupational and community accident risks **In the recruitment processes**: • Risk of exclusion of vulnerable groups • Exclusion of local labor and discrimination • Influx of labor from outside the place. **In the execution of the planned works:** **Occupational hazards**: • Accidents and falls of different levels • Falling objects • Road accidents (circulation of trucks and machinery) • Temporary hearing loss due to operation of equipment and machinery. **Ergonomic risks**: • Forced posture; Repetitive motion; Cargo handling; Application of forces: Overexertion	Contractor Company

Construction supervision	Supervise the strategic environmental and social management plan, occupational safety and health; monitor environmental, social, health and safety risks, their impacts and actions taken (including in the field, if necessary).	Office / Field activities at the site of implementation of the works	**In Office:** No specific and considerable risks are identified. Possible risks linked to occupational health and safety in internal environments (accidents, stress, mental load, psychophysical factors). **In the field:** Risks linked to accidents in the work area. They can be minimized if PPE is properly used.	WSC / Construction Inspection

Description of prevention and mitigation measures to address possible risks in the workplace

Based on the identification of the main risks by activity group, the priority measures to prevent and minimize the risks identified are detailed below, by way of example:

- Prevention and mitigation measures in the workshops:
- Implement hygiene, safety and health standards and conditions.
- Install workshops of size according to the number of people employed and as required by Laws and Decrees.
- Training and awareness on health and safety, non-discrimination, and prevention of gender-based violence, prevention of child exploitation, forced labor, prevention of discrimination and / or violence against people from indigenous communities or vulnerable groups in compliance with the code of conduct.

Prevention and mitigation measures in staff recruitment processes:

- The contractor will seek to approach its recruitment process with a gender perspective, seeking to make equal opportunities for men and women effective.
- Personnel with criminal records related to sexual crimes, sexual harassment, prostitution, and trafficking in persons will not be hired in order to protect the integrity of the population linked to the work.
- The contractor will try to prioritize the local skilled and unskilled local labor, especially of the beneficiary parties of the works and surrounding localities.
- Non discrimination requires that the contractor/ WSC not make employment-related decisions based on personal characteristics, such as gender, race, ethnic, social and indigenous origin, religion, political opinion, nationality, disability and sexual orientation that are not related to job requirements. They cannot affect equality of opportunity or treatment in employment.

- The contractor shall develop and implement the code of conduct and provide training for its knowledge and understanding. See Appendix A for the proposed content of the code of conduct. This Code is aimed at ensuring respectful and harmonious ties in the workplace in which the Program and its projects are developed in such a way as to ensure a work environment free of discrimination and/or violence based on gender, gender identity, sexual orientation, cultural identity, religion, ethnic or national origin, trade union membership, disability or any other discrimination typified in current legislation.

Prevention and mitigation measures in the execution of civil works of infrastructure and equipment of the project:

Review the environment in which the tasks will be developed. If power poles, hazardous materials tanks or other items are present in adjacent areas, they could catch fire or fall on workers in the event of evacuation.

- Provision of personal protection elements (PPE) and tools and machinery in perfect working order.
- Training and advisory programs for the people employed by the contractor on the inherent risks of their tasks and the mitigation measures, actions and good practices to be implemented to ensure the health, safety and hygiene of the employees, the population, and the protection of the environment
- Code of conduct.
- Evaluate the state of gas, electricity, and water facilities near the intervention area.
- Examine the distribution of workspaces verifying that there are no elements that could interfere with a rapid evacuation.
- Identify safe areas.
- Determine accessibility to fire protection equipment, emergency lights, first aid equipment, etc. (they should always be in place of easy access).
- Define the resources available to avoid and respond to an emergency.
- Make an inventory of those security elements that the organization has (fire extinguishers, first aid kit, etc.).
- In the case of works conducted in the vicinity of routes, traffic management measures, signaling and communication program to the community must be extreme.

Protocols and procedures to address cases of gender-based violence during the life cycle of the project.

The Contractor will establish reporting procedures, protocol for responses to unacceptable conduct and internal accountability measures in situations of gender-based violence within the framework of the operation.

In terms of prevention, in addition to urging the development of actions aimed at dismantling all types of situations of inequality, discrimination and exclusion in the workplace, actions can be implemented to raise awareness and train on gender issues. The training program will be defined according to the demands of the different work teams.

To address cases of gender violence, immediate and confidential contact should be made with local authorities who are experts in the field if the victim gives clear and enthusiastic consent to do so, to ensure adequate treatment of the victim of violence, providing specific advice and accompaniment. The

identity of the complainant should be kept confidential in order to protect against retaliation, stigmatization, revictimization or other consequences that frequently can happen.

Grievance Redress Mechanism (GRM) for Project Labor Management

The Program has a Grievance Redress Mechanism (GRM), and at the same time the LMP has a simultaneous mechanism that aims to arbitrate the means and mechanisms to facilitate the reception of concerns exclusively (queries, claims, complaints, suggestions) of workers linked to the Projects of the Program, and respond to them to solve them, and to anticipate potential conflicts.

Likewise, workers may appeal directly to the courts, applying the general system in force in the country.

Principles of the GRM for the Labor Management Procedure

Each project will have a feedback/claims management system that includes input/reception, analysis, monitoring, resolution and return to the people who are working linked to the projects.

The principles that the system will observe are the same as those that govern the general GRM of the Program:

- The interaction/claims management system will have mechanisms in accordance with the local context and the sociocultural characteristics of the people involved in each project, with special consideration and respect for the most vulnerable groups (young people, women, people with disabilities, migrants, among others).
- The complaint procedures, the process that will follow, the deadline and the resolution mechanisms will be widely disseminated for your knowledge by the interested parties, that is, by direct workers, contractors, and primary suppliers.
- In all cases, a record will be kept of the reception, analysis and resolution of claims and conflicts.

GRM Guidelines

In general, the mechanism will follow the following guidelines:

- **Proportional**: The Mechanism will proportionally consider the level of risk and possible negative impacts on the affected areas.
- **Culturally appropriate**: The Mechanism will be designed to consider the local customs of the area.
- **Accessible**: The Mechanism will be designed in a clear and simple way so that it is understandable to all people. There will be no cost related to it.
- **Anonymous**: The complainant may remain anonymous, as long as it does not interfere with the possible solution to the complaint or problem. Anonymity is distinguished from confidentiality in that it is an anonymous complaint, the personal data (name, address) of the complainant are not recorded.
- **Confidential**: The Program will respect the confidentiality of the complainant. Information and details about a confidential report will only be shared internally, and only when it is necessary to report or coordinate with the authorities.
- **Transparent**: The process and operation of the Mechanism will be transparent, predictable, and readily available for use by the population.

Management of the specific GRM for the Labor Management of the projects of the Program

The procedure begins with the presentation of the consultation, claim, complaint and / or suggestions (orally or written) by any worker linked to the works. The process ends with the closure and agreement in the resolution of both parties (the claimant and the contractor). The process will be documented by means of a record (in a physical and/or digitized file).

Complaints received by all means of receipt enabled during the implementation of the Project must be attended and classified.

The claims received via the contractors of each work, or agencies of the municipal authority (if applicable) must be redirected to WSC for management.

Reception and registration of claims for the labor management of the project

- Office of contractors (specific modality for operators and employees)
- Suggestion box / complaints book available in the workshops (Specific for operators and employees).

Claims Evaluation

All claims that enter through the various channels must be registered and managed considering the criterion of proportionality (level of risk and possible negative impacts).

In the case of a claim related to employees of the contractor, it will be considered and responded to by the Contractor Company with supervision of WSC.

The file must include, together with the complaint, a summary of the procedures and steps taken. Registration information will be updated periodically to reflect the status of the case until the complaint has been finalized.

Conflict resolution

In all cases, the contractor company must ensure that the attention of claims and the resolution of conflicts are conducted in an adequate and timely manner, and that all workers linked to the project of the Program have a satisfactory management of their claim.

Responding to Complaints

Low-importance claims will be dealt with within a maximum of 30 calendar days, medium importance claims will be dealt with within 15 calendar days and high-importance claims will be dealt with within a maximum of 7 calendar days. The established deadlines can be adjusted by the contractor company.

Monitoring and documentation

The contractor company will be responsible for maintaining an up-to-date database with all documentation and information related to complaints that are submitted as part of labor management. This team is also responsible for following up on the complaint processing process, in coordination with the areas involved, and for facilitating the participation of the worker in the process.

The complaint registry must demonstrate that all of these actions and processes were conducted in accordance with this document.

It will include:

- Date on which the complaint was registered;
- Person responsible for the complaint;
- Information on the corrective measures proposed/communicated by the complainant (if applicable);
- Date on which the complaint was closed; and
- The date of the reply was sent to the complainant.

Deadlines

All complaints must be registered, and the proposed solution must be communicated to the interested party within a stipulated period. The deadlines set can be adjusted.

Monitoring

Any complaint closed with compliance by the complainant must be monitored for a reasonable period in order to verify that the reasons for the complaint or claim were effectively resolved. The estimated period for this purpose is 6 (six) months from the response and / or solution to the claim.

As initially indicated, this document is dynamic in nature, therefore the specific procedures for the implementation of the Grievance Mechanism for Labor Management will be strengthened with the implementation of each project.

12 ANNEX 2: STAKEHOLDER ENGAGEMENT PLAN

Introduction

This Stakeholder Engagement Plan was developed to describe the socialization process of the Bahamas Water Supply and Sanitation Systems Upgrade Program (BH-L1061) Program.

This Plan sets out the general principles of participation and a collaborative strategy to identify stakeholders and plan a participatory process in line with Environmental and Social Performance Standard 10: "Stakeholder Engagement and Information Disclosure" along with ESPS 1 "Assessment and Management of Environmental and Social Risks and Impacts" and ESPS 9 "Gender Equality".

Stakeholder engagement is an inclusive, continuous, and iterative process that takes place throughout the project lifecycle (preparation, implementation, and closure). The process must be properly designed and conducted, sustained by the establishment of solid, constructive, and responsive relationships that are important for the satisfactory management of the environmental and social risks and impacts of the Program/Project.

The nature, scope and frequency of stakeholder engagement is commensurate with the nature and scale of each project, its development and implementation schedule, and its potential risks and impacts. WSC as the Executing Agency will be responsible for defining and evaluating the necessary instances of participation and dissemination of the works.

The entire participation process must be properly documented. WSC shall take steps to maintain confidentiality where required and where necessary to protect personal data.

It is in this context, the following Stakeholder Engagement Plant is proposed, which presents the minimum guidelines and criteria to conduct the consultation process.

Objective

The objective of the consultation process is to present to the affected population and other interested parties the description of the Project, its potential environmental and social impacts and the mitigation measures planned to ensure adequate environmental and social management during the execution of the works, and their subsequent operation.

This instance of participation aims to respond to the doubts and concerns that may arise, and to collect suggestions which will be evaluated to determine the possibility of incorporating them into the design of the Project, when appropriate.

Institutional Arrangements for Plan Implementation

WSC as the Borrower is responsible for leading and implementing the Stakeholder Engagement Plan.

Consultation Process

The programming and dissemination of the consultation should be conducted in such a way as to ensure the participation of stakeholders. Every effort will have to be made to involve groups likely to be affected

by the activities of the project, and those groups that have been identified as stakeholders, regardless of whether they do not belong to the affected population.

It is important to recognize the reduced accessibility to these consultation spaces by populations with greater vulnerabilities such as women, original communities, people in situations of immobility, people in street situations, LGBTIQ + populations (lesbian, gay, bisexual, trans, intersex, queer), among others. With this, it must be ensured that the call is made considering the obstacles that these populations may face for participation.

The consultation process shall consider at least the following elements:

- Stakeholder Mapping
- Documents to disclose and availability of information
- Dissemination of the consultation process through the WSC website, social media, and other means
- Development of content and documentation to be socialized
- Public consultation procedure
- Report of the public consultation process

Below is a brief description of the requirements to be considered at each stage of the consultation process.

Stakeholder Mapping

Stakeholder mapping consists of identifying the directly affected population and organizations relevant to the consultation.

From a preliminary identification, it emerges that, at a minimum, the stakeholders presented Table 44 should be included in the process.

It is important to note that the proposed stakeholder mapping is preliminary, and that the final selection of the stakeholders can be adjusted by WSC. Therefore, any other stakeholders that the authorities consider appropriate to invite to contribute to guaranteeing a broad, representative, and meaningful participatory process may then join.

Table 44 - Stakeholder

Mapping Type of Stakeholder	Stakeholder	Relationship with the Program/ Project	Stakeholder Interest in the Project (High / Medium / Low)	Stakeholder Influence on Project (High / Medium / Low)
Institutional Stakeholders	Water and Sewerage Corporation (WSC)	Executing Agency	High	High
	Department of Environmental Health Services (Family Islands Subdivisional Offices)	Interested Party	Low	Low
	Department of Environmental Planning and Protection	Interested Party	Low	Medium

	Stakeholders related to other infrastructure and services in the project areas (e.g., Bahamas Power and Light Company, Cable and Internet Companies, etc.)	Affected Party	Medium	Low
Civil Society Stakeholders	Population living in the direct area of influence of the projects	Affected Party	High	Medium
	Businesses and informal workers in the direct area of influence of the projects	Affected Party	High	Medium
	Representatives from institutions in the direct area of influence of the projects (e.g., schools, health centers, etc.)	Affected Party	Medium	Medium
	Civil Society Organizations (in particular, those working in environmental and social issues)	Interested Party	Medium	Low
Community	Population of the communities reached by the Project and community in general (indirect area of influence)	Interested Party	Medium	Low

Documents to Disclose and Availability of Information

Below are the documents to be socialized, which must be published on WSC's website and other means, and available to the public for at least 10 days prior to the consultation events.

- Strategic Environmental and Social Assessment, including the Strategic Environmental and Social Management Plan (first draft, Fit for Disclosure)
- Summary information on the Project (description of objectives, works, etc.)

Once the information is available on the website, the consultation process will be disseminated to interested parties.

Public Consultation Events

The consultation process will be conducted before the commencement of the project. It will consist of a single consultation event, conducted in in-person format, (town hall meeting), on the island of the proposed works. The final date and venue, as well as the streaming platform to be used, will be defined by WSC.

This consultation event will be complemented with community information campaigns, to be conducted prior to the start of the works, on each work location, once the engineering design details of the projects are known.

WSC will be responsible for the invitations to the consultation event. The invitation to the event will be made directly to the interested parties identified in the stakeholder mapping, 10 days in advance of the event date.

To ensure maximum stakeholder participation, the event will also be disclosed to the public starting at least 10 days prior to the event date, through publication in relevant information media, such as radio,

local TV and / or digital media, important newspapers, and on the institutional website and social network profiles of WSC. Also, personal email submissions and brochure handouts can be used, to ensure adequate dissemination of the process.

Proposed content of the invitation

The following information shall be detailed in the invitation to the consultation event:

- Project Proponent: WSC
- Project/Program
- Website with the publication of the documentation (ESA/ESMP) and as a space for sending queries or concerns about the Project.
- Procedure of the consultation process
- Duration of the consultation process
- Topics to be addressed, including: Program and main works to be conducted, benefits associated with the operation of the Project, Parties involved and institutional responsibilities, Outline of the applicable regulatory framework and relevant standards, Main environmental and social impacts identified, main environmental and social management measures, and grievance redress mechanism.
- Documentation available

Development of the Public Consultation Process

Disclosure of Documents

WSC must publish the ESA/ESMP for a minimum of 14 days prior to the event.

The consultation process announcement should explain the objective of the consultation, clarifying that, although it is not in itself legally binding, the questions and proposals arising from the persons participating will be considered, where relevant, the proposed amendments will be incorporated.

Then the context in which the consultation takes place will be explained, and the description of the Project will be made, including its objectives, main characteristics and alternatives considered.

The presentation then follows with the environmental and social impacts and risks identified, both in the construction and operation stages, as well as the mitigation measures designed for an adequate environmental and social management of the Project.

The Grievance Redress Mechanism and the available channels for filing complaints or consultations on the Project will also be disclosed. The explanation should be clear, and the language used should allow the community to understand the main aspects of the project and its impacts.

After the presentation, adequate time will be allowed for questions and suggestions from participants, including both in-person as well as virtual attendees.

WSC shall disclose the estimated date and how the consultation report will be published so that all stakeholders can read it and make their observations, if any.

The development of the event, including questions from participants, replies given, and commitments made, will be properly documented to include in the consultation report [see next Section].

Proposed Structure of the Consultation Report

A report will be prepared containing the main concerns raised (both during the consultation process and any prior or subsequent requests that may be received), indicating how they were addressed at the time or, where appropriate, what responses were subsequently prepared and how they were communicated to stakeholders and the public.

Although, as mentioned, the consultation is not legally binding, the proposals received should be evaluated and the explanation of their relevance or not included in the report. If these are relevant, the consultation report will result in proposals for changes to the Project and/or the ESMP, specifically recommendations for: (i) project design; (i) mitigation measures and (iii) mechanism for dealing with complaints and grievances.

The consultation report, to be prepared by the PEU based on information gathered at the public consultations, will also include the invitation process, the links to the web pages where the project has been published and the corresponding environmental and social documentation, the description of the call mechanism used, the list of participants, photos or screenshots of the process, informative banners, publications made in local media, and other dissemination materials used.

The following is a minimum content outline / proposed structure of the Consultation Report:

1. Participation strategy: Description of how the consultation process was developed (prior coordination with authorities, key stakeholders, methodology, selection of topics to be addressed, etc.).
2. Stakeholder mapping (groups, institutions or people who were invited) and selection criteria of the invited stakeholders, Invitation mechanism.
3. Dissemination: Invitations issued and publications of the event on institutional websites and media.
4. Website used for disclosure of information.
5. Analysis of the people who participated compared to the invitees.
6. Gender-disaggregated data of participants.
7. Materials disclosed during the consultation process.
8. Questions and answers (suggestions, claims or questions made by the different stakeholders during the process, and how they were addressed).
9. Indication of how the suggestions and/or complaints received were incorporated/or will be incorporated into the design of the project. Any formal agreement reached with the persons consulted.
10. The main conclusions on positive or negative perception of the project by the participants, including the agreements.
11. Feedback collected from the consultations and included in the final version of the ESIA and ESMP.
12. ANNEX. Copy of the presentations made (it must be ensured that the impacts and mitigation measures of the specific project have been presented).
13. ANNEX. Sample copy of invitation letters sent.
14. ANNEX. Copy of the RSVPs of the invitation letters.

15. ANNEX. List of invited people.
16. ANNEX. List of participants: interested persons/affected persons, governmental, institutional, and general population participants.
17. ANNEX. Photographs of the activity / screenshots of online event.

The consultation report must be published on the institutional website of EA, as communicated to the persons participating in the consultation meeting.

13 ANNEX 3 GRIEVANCE REDRESS MECHANISM (GRM)

The Program and its projects will have a feedback / claims management system that includes their entry / reception, analysis, monitoring, and resolution.

GRM Guidelines

In general, the Mechanism will follow the following guidelines:

- Proportional: The Mechanism will proportionally consider the level of risk and possible negative impacts on the affected areas.
- Culturally appropriate: The Mechanism will be designed to consider the local customs of the area.
- Accessible: The Mechanism will be designed in a clear and simple way so that it is understandable to all people. There will be no cost related to it.
- Anonymous: The complainant may remain anonymous, as long as it does not interfere with the possible resolution of the complaint or problem. The GRM need to ensure that complaints can be raised anonymously. Anonymity is distinguished from confidentiality in that it is an anonymous complaint, the personal data (name, address) of the complainant are not recorded.
- Confidential: The Program will respect the confidentiality of the complaint. Information and details about a confidential report will only be shared internally, and only when it is necessary to report or coordinate with the authorities.
- Transparent: The process and operation of the Mechanism will be transparent, predictable, and readily available for use by the population.

Management of the GRM

The procedure begins with the presentation of the consultation, claim, complaint and / or suggestions (orally or written) by any person linked to the actions of the Program. The process ends with the closure and agreement in the resolution of both parties. The process will be documented by means of a record (in a physical and digitized file). Complaints received by WSC must be addressed and classified. Complaints received at the level of individual projects to be financed by the Program (via the contractors of each work, or departmental or municipal agencies) must be redirected to WSC for management and follow-up.

Scope

The GRM applies and may be used by any person (general population) who expresses any type of claim, complaint or query related to the activities planned by the projects to be financed by the Program.

- Point of Contact: projectcomplaints@wsc.com.bs
- Complaints acknowledged within 3 working days
- Standard resolution time of 15 working days; escalation to senior management if unresolved
- Monthly reporting on number, type and resolution of grievances

13.1.1 Dissemination of the Grievance Redress Mechanism

Information on these means of receiving complaints must be disseminated through the various communication channels used by the Program, among which are:

1. Social Media Sites
2. Verbal communications given to customers who have complaints in the field
3. Consultation Process

13.1.2 Receipt and Registration of Claims

The following mechanisms and channels will be available for the reception of concerns. Once a concern/comment is received, it will be logged into an Excel document:

- Receiving email: projectcomplaints@wsc.com.bs

- Complaints entered by WSC's usual means of contact: online form on webpage and hotline (242-302-5500)
- Claims received by the Contractor will also be logged into the Excel log to maintain complete records

13.1.3 Claims Evaluation

In the case of a claim related to the works, it will be considered and responded to by the Contractor Company or WSC.

If the claim or complaint is rejected, the complainant will be informed of the decision and the reasons for it. To this end, relevant and understandable information will be provided in accordance with the sociocultural characteristics of the claimant.

Complaints received will be categorized according to the following:

NOT ADMISSIBLE: Complaints or claims that do not meet one or more of these requirements:

- It is not directly related to the work, its contractors, or the actions of the project.
- Its nature exceeds the scope of GRM.
- There is no real cause of the action.
- There are other formal mechanisms and institutions for filing complaints according to the nature of the complaint.
- Related to labor issues must be addressed to the corresponding instances of the construction company.

LOW IMPORTANCE: This category corresponds to complaints that do not require resolution, but only require information or a certain clarification that must be provided to the complainant. This category includes complaints that have been previously evaluated and received a definitive response from the Program.

MEDIUM IMPORTANCE: Complaints and claims related to health, the environment, transportation, and contractors and subcontractors.

HIGH IMPORTANCE: Includes complaints related to the safety of personnel, as well as those related to the health and safety of construction workers.

Within a period not exceeding ten working days, the social manager of the contractor or the unit in which the complaint is registered will have to evaluate the documentation presented by the claimant.

Where possible, if additional information is required for the proper evaluation of the complaint, the executing agent (EA) will contact the complainant within a maximum of ten working days, to obtain the necessary information. Once the complaint is completed and reviewed, project staff will proceed to register the complaint.

13.1.4 Grievance Closure and Monitoring Mechanism

The resolution of claims will be conducted through two instances:

1. **Internal.** The management of reception of claims and resolution of conflicts is the responsibility of WSC and will be referred to the competent agency in the subject according to the complaint / claim.
2. **Mediation**. Cases of claims and conflicts not resolved in the first instance will be dealt with under the mediation mechanism. The person in charge of this instance must have

sufficient authority to mediate for the resolution of claims and conflicts, and sufficient independence to project credibility in the parties.

Conflict Resolution

If there is no agreement between WSC and a complainant, either because of a rejected concern or because there is no agreement on the solution to be implemented, the means to reach a joint agreement between the parties must be arbitrated. This may include, among others: promoting the participation of technical third parties, inviting dialogue tables, mediations, conciliations, etc.

WSC shall ensure that claims handling and dispute resolution are conducted in an appropriate and comprehensive manner.

In the event that the complaint cannot be managed within the scope of the work, the interested party may present his claim through the regular Justice procedures.

The IDB's Independent Consultation and Investigation Mechanism (ICIM), available on its website https://www.iadb.org/mici/, is also available.

Deadlines for Response to Claims

All complaints must be registered, and the proposed solution must be communicated to the interested party within the following deadlines: low importance complaints will be dealt with within a maximum period of 30 calendar days, medium-importance complaints will be dealt with within 15 calendar days, and high importance complaints will be dealt with within a maximum period of 7 calendar days. The deadlines set can be adjusted by WSC.

In all cases, a complaint response report will be drawn up and signed by the person who filed the complaint in accordance with the attention of the complaint. WSC will systematize the complaint records and the minutes of attention of these.

The information provided will be relevant and understandable according to the sociocultural characteristics of the person who consults. Likewise, it will oversee supervising the process, detecting deviations, and ensuring its solution.

Monitoring and Documentation

WSC will be responsible for maintaining an up-to-date database with all documentation and information related to complaints submitted. It will also be responsible for following up on the complaint processing process, in coordination with the areas involved, and for facilitating the complainant's participation in the process.

A follow-up form will be completed for each case. Once an agreement is reached, follow-up will be followed up to confirm that the relevant resolution measures are being implemented.

The complaint registry must demonstrate that all these actions and processes were conducted in accordance with this document.

It will include:

- Date on which the complaint was registered;
- Person responsible for the complaint;
- Information on the remedies proposed/communicated by the complainant (if applicable);

- Date on which the complaint was closed; and
- The date of the response was sent to the complainant.

In the Semiannual Compliance Reports, WSC will report to the IDB on the status and follow-up of the management of complaints and grievances received in the framework of the execution of the Program's projects.

Monitoring

Any complaint closed with conformity by the complainant must be monitored for a reasonable period in order to verify that the reasons for the complaint or claim were effectively resolved. The estimated period for this purpose is 6 (six) months from the response and / or solution to the claim.

Implementation Timeline

The GRM will be available throughout the execution of the Program.

IDB Program Grievance Mechanism

In addition to the Grievance Redress Mechanism (GRM) of the Program implemented by EA, the IDB, on the Project page, will present a public access mechanism with which complaints and claims that have not been resolved with the mechanism of each project can be managed.

IDB's Independent Consultation and Investigation Mechanism

The IDB also has an Independent Consultation and Investigation Mechanism (MICI, more info at https://www.iadb.org/en/mici/mici-independent-consultation-and-investigation-mechanism), which can also be accessed to process complaints that could not be resolved at the previous two levels of grievance mechanisms.

MICI is a grievance office independent of the project teams, which facilitates dispute resolution processes to resolve concerns raised. In addition, it conducts independent investigations to determine whether the IDB Group has met its standards and improve the Group's practices.

Keep in mind that the handling of a complaint must start at the local level to be eligible at the next level. All grievance mechanisms will be available throughout the duration of the Program.

14 APPENDIX A - CODE OF CONDUCT - MODEL AND SUGGESTED CONTENT

Model Standard Code of Conduct for Workers

Introduction

The company is committed to ensuring a work environment which minimizes any negative impacts on the local environment, communities, and its workers. The company also strongly commits to creating and maintaining an environment in which Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH) have no place, and where they will not be tolerated by any employee, sub-contractor, supplier, associate, or representative of the company. The purpose of this Code of Conduct is to:

1. Create a common understanding of what constitutes Sexual exploitation and abuse, and sexual harassment.

2. Create a shared commitment to standard behaviors and guidelines for company employees to prevent, report, and respond to SEA and SH.

3. Create understanding that breach of this code of conduct will result in disciplinary action.

Definitions

Sexual Exploitation and Abuse (SEA)

Is defined as any actual or attempted abuse of a position of vulnerability, differential power, or trust, for sexual purposes, including, but not limited to, profiting monetarily, socially or politically from the sexual exploitation of another.

Sexual Abuse: “The actual or threatened physical intrusion of a sexual nature, whether by force or under unequal or coercive conditions.”

Sexual Harassment:

Unwelcome sexual advances, request for sexual favors, and other verbal or physical conduct of sexual nature.

Sexual Harassment versus SEA

SEA occurs against a beneficiary or member of the community. Sexual harassment occurs between personnel/staff of an organization or company and involves any unwelcome sexual advance or unwanted verbal or physical conduct of a sexual nature. The distinction between the two is important so that agency policies and staff trainings can include specific instruction on the procedures to report each.

Consent is the choice behind a person’s voluntary decision to do something. Consent for any sexual activity must be freely given, ok to withdraw, made with as much knowledge as possible, and specific to the situation. If agreement is obtained using threats, lies, coercion, or exploitation

of power imbalance, it is not consent. Under this Code of Conduct consent cannot be given by anyone under the age of 18, regardless of the age of majority or age of consent locally. Mistaken belief regarding the age of the child is not a defense.

- There is no consent when agreement is obtained through:
- the use of threats, force or other forms of coercion, abduction, fraud, manipulation, deception, or misrepresentation
- the use of a threat to withhold a benefit to which the person is already entitled, or
- a promise is made to the person to provide a benefit.

While all forms of violence against a community resident or a co-worker are forbidden, this code of conduct is particularly concerned with the prevention and reporting of sexual exploitation and abuse (SEA) and sexual harassment which constitute gross misconduct, is grounds for termination or other consequences related to employment and employment status:

(1) Examples of sexual exploitation and abuse include, but are not limited to:

- A project worker tells women in the community that he can get them jobs related to the work site (cooking and cleaning) in exchange for sex.
- A worker that is connecting electricity input to households says that he can connect women headed households to the grid in exchange for sex.
- A project worker gets drunk after being paid and rapes a local woman.
- A project worker denies passage of a woman through the site that he is working on unless she performs a sexual favor.
- A manager tells a woman applying for a job that he will only hire her if she has sex with him.
- A worker begins a friendship with a 17-year-old girl who walks to and from school on the road where project related work is taking place. He gives her moto rides to school. He tells her that he loves her. They have sex.

(2) Examples of sexual harassment in a work context include, but are not limited to:

- Male staff comment on female staffs' appearances (both positive and negative) and sexual desirability.
- When a female staff member complains about comments male staff are making about her appearance, they say she is "asking for it" because of how she dresses.
- A male manager touches a female staff members' buttocks when he passes her at work.
- A male staff member tells a female staff member he will get her a raise if she sends him naked photographs of herself.

Individual signed commitment:

I, _____, acknowledge that sexual exploitation and abuse (SEA) and sexual harassment, are prohibited. As an (employee/contractor) of (contracted agency / subcontracted agency) in (country), I acknowledge that SEA and SH activities on the work site, the work site surroundings, or the surrounding community constitute a violation of this Code of

Conduct. I understand SEA and SH activities are grounds for sanctions, penalties or potential termination of employment. Prosecution of those who commit SEA and SH may be pursued if appropriate.

I agree that while working on the project I will:

- Treat all persons, including children (persons under the age of 18), with respect regardless of sex, race, color, language, religion, political or other opinion, national, ethnic or social origin, gender identity, sexual orientation, property, disability, birth or other status.
- Commit to creating an environment which prevents SEA and SH and promotes this code of conduct. In particular, I will seek to support the systems which maintain this environment.
- Not participate in SEA and SH as defined by this Code of Conduct and as defined under (country) law (and other local law, where applicable).
- Not use language or behavior towards women, children or men that is inappropriate, harassing, abusive, sexually provocative, demeaning or culturally inappropriate.
- Not participate in sexual contact or activity with anyone below the age of 18. Mistaken belief regarding the age of a child is not a defense. Consent from the child is also not a defense. I will not participate in actions intended to build a relationship with a minor that will lead to sexual activity.
- Not solicit/engage in sexual favors in exchange for anything as described above.
- Unless there is the full consent by all parties involved, recognizing that a child is unable to give consent and a child is anyone under the age of 18, I will not have sexual interactions with members of the surrounding communities. This includes relationships involving the withholding or promise of actual provision of benefit (monetary or non-monetary) to community members in exchange for sex—such sexual activity is considered "non-consensual" under this Code.

I commit to:

- Adhere to the provisions of this code of conduct both on and off the project site.
- Attend and actively partake in training courses related to preventing SEA and SH as requested by my employer.

If I am aware of or suspect SEA and SH, at the project site or surrounding community, I understand that I am encouraged to report it to the Grievance Reporting Mechanism (GRM) or to my manager. The safety, consent, and consequences for the person who has suffered the abuse will be part of my consideration when reporting. I understand that I will be expected to maintain confidentiality on any matters related to the incident to protect the privacy and security of all those involved.

Sanctions: I understand that if I breach this Individual Code of Conduct, my employer will take disciplinary action which could include:

- Informal warning or formal warning

- Additional training.
- Loss of salary.
- Suspension of employment (with or without payment of salary)
- Termination of employment.
- Report to the police or other authorities as warranted.

I understand that it is my responsibility to adhere to this code of conduct. That I will avoid actions or behaviors that could be construed as SEA and SH. Any such actions will be a breach this Individual Code of Conduct. I acknowledge that I have read the Individual Code of Conduct, do agree to comply with the standards contained in this document, and understand my roles and responsibilities to prevent and potentially report SEA and SH issues. I understand that any action inconsistent with this Individual Code of Conduct or failure to act mandated by this Individual Code of Conduct may result in disciplinary action and may affect my ongoing employment.

Signature: _____

Printed Name: _____

Title: _____

Date: _____

15 APPENDIX B – WSC HURRICANE PREPAREDNESS PLAN

16 APPENDIX C – PROJECT DRAWINGS – PORT ROYAL