THE BAHAMAS WATER SUPPLY AND SANITATION SYSTEMS UPGRADE PROGRAM

(BH-L1061)

Component 3 - Access to Potable Water Supply

Environmental and Social Assessment (ESA) and

Environmental and Social Management Plan (ESMP)

Bimini Airport Road Works

December 2025

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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 Airport Road water mains installation in South Bimini. The project aims to expand access to safe and reliable piped water for households, institutions, and businesses, thereby improving public health, equity, and resilience. The project corridor presents challenges such as poor drainage, low-lying terrain, and potential construction-related disruptions. However, these will be mitigated through measures to manage dust, erosion, vegetation disturbance, noise, and access. No protected areas are affected, and the project will comply with all national environmental requirements and IDB environmental and social standards. The ESA/ESMP includes comprehensive management plans addressing environmental protection, community health and safety, stakeholder engagement, and grievance redress. With these safeguards and monitoring systems in place, the Airport Road water mains installation is expected to have low environmental and social risk and provide lasting social, economic, and public health 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
SESM	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 Airport Road water mains installation works in South Bimini, a key activity under *Component 3: Access to Potable Water Supply*.

The Airport Road corridor serves as the primary access route connecting the South Bimini airport to the ferry terminal and the settlements on North Bimini. Although not densely developed, the corridor is a critical infrastructure link that supports mobility, logistics, and tourism flow. The area is characterized by poor road conditions, the lack of drainage infrastructure, naturally vegetated shoulders, and low-lying terrain prone to flooding during rainfall events. These baseline conditions require careful planning to prevent erosion, manage potential runoff, and avoid disturbance to natural landforms during trenching and pipe-laying operations.

From a social perspective, this project component is expected to bring significant improvements to household well-being, equity, and quality of life across South Bimini. The targeted communities currently face challenges in securing safe and affordable water, relying instead on private wells, bottled water, or rainwater, sources that are both costly and unreliable. By expanding piped water access, this component directly contributes to public health, household savings, and strengthens social resilience by ensuring a more reliable and equitable distribution of this essential service. Beyond households, schools, clinics, churches, and local businesses, including those in the tourism and hospitality sectors, will benefit from improved operational stability and hygiene, supporting both service continuity and economic 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;
- 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.

The Airport Road corridor does not intersect with any protected areas or ecologically sensitive habitats. However, good housekeeping, proper staging, and storm-preparedness protocols are essential to prevent localized impacts, ensure public safety, and maintain alignment with broader climate resilience and social inclusion goals.

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

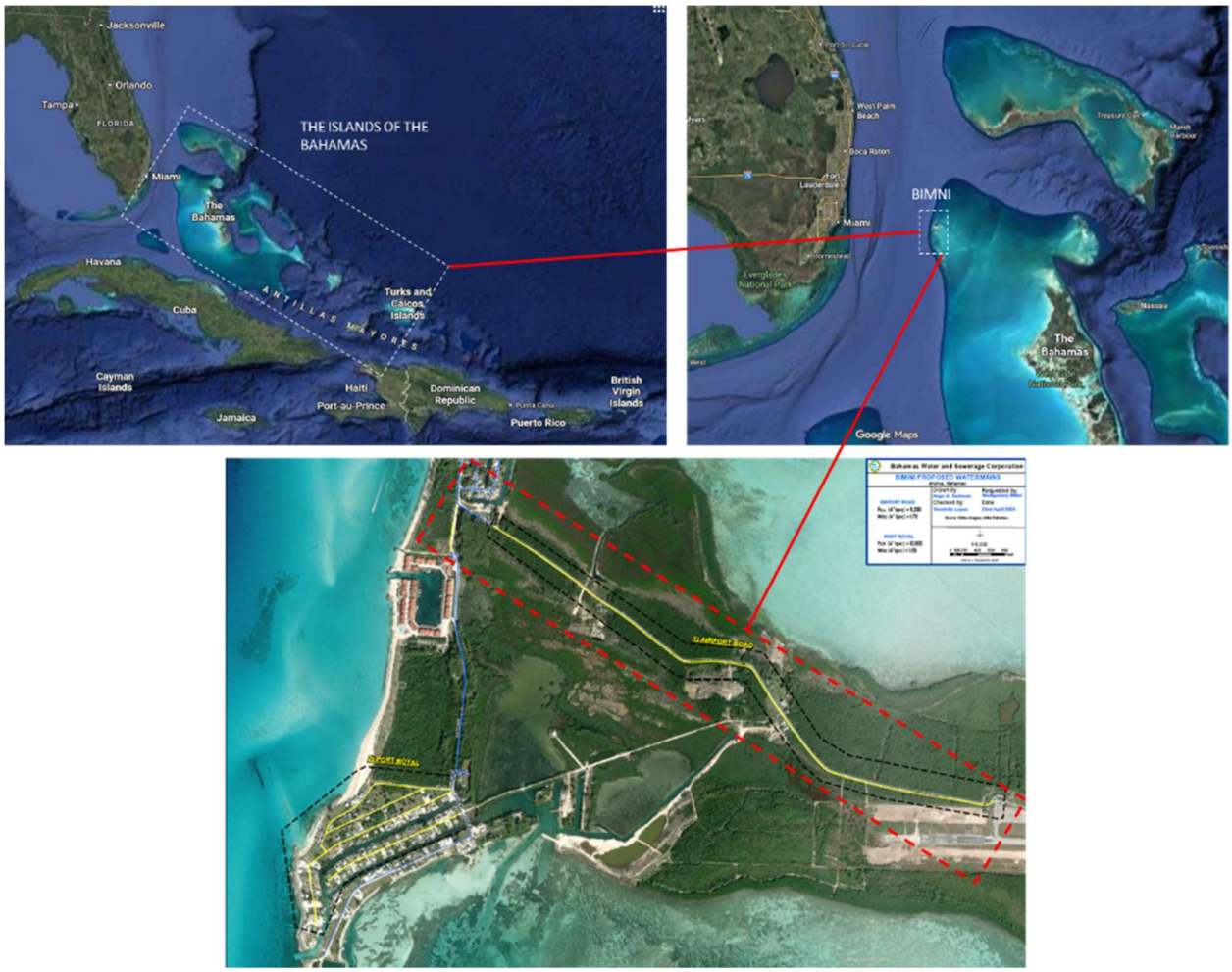
- Clear monitoring responsibilities;
- Documentation of compliance with environmental and social safeguards;

- 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 the Airport Road 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 Airport Road alignment in South Bimini.



The Airport Road is a single partially paved carriageway connecting the South Bimini Airport to the ferry dock and adjacent communities. It functions as a critical access and logistics route that supports air-sea transport connectivity, tourism activity, and emergency response. The surrounding area is predominantly undeveloped, with a mix of natural vegetation, open clearings, and limited built infrastructure.

The planned activities include:

- Trenching and installation of approximately 9,300 feet of 4-inch and 680 feet of 6-inch PVC water mains;
- Installation of service lateral connections;
- Backfilling, site restoration, and reinstatement of affected areas.

The only chemicals utilized under this project will include fuel for machinery. 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.

Trenching (16 inches) will occur along the southern shoulder of the roadway, as per the drawing specifications in *Appendix C*, which lies adjacent to naturally vegetated buffers. The corridor presents several environmental constraints, including no formal drainage system, sandy and loosely compacted soils, and a high incidence of water pooling during heavy rainfall, all of which influence the timing, logistics, and environmental sensitivity of construction activities.

From a social perspective, the project is expected to bring significant public health and equity benefits to households and businesses across South Bimini. Many residents currently rely on private wells, bottled water, or rainwater tanks, which are often expensive, unreliable, or vulnerable to contamination, especially during storms or system disruptions. By expanding piped water access, the Airport Road works will improve reliability, affordability, and safety of water services.

In addition to benefiting households, the upgraded mains will support critical infrastructure such as the airport, clinics, schools, churches, and small tourism enterprises, all of which depend on reliable water to maintain operations, hygiene, and resilience during emergencies. This will also help bolster economic confidence, reduce operational risks in hospitality and transport services, and enhance the island's ability to retain investment and manage long-term growth.

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 resiliency.

2.1.1 Project Implementation, Supervision, and Management

The implementation of activities under **Component 3: Access to Potable Water** in Airport Road, 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.

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.

2.1.2 Costs and Financing

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 Airport Road extension is estimated at $637,000.00 supporting both residential needs and infrastructure serving the tourism and transport sectors.

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

2.1.3 Expected Benefits

The new water mains along South Bimini Airport Road will strengthen community resilience by ensuring safe and dependable water delivery to nearby residences, businesses, and essential facilities. Although the Airport Road corridor is lightly developed, it serves as a key access route for residents, airport staff, and visitors traveling through the island.

Reliable and consistent water service is therefore vital not only for protecting public health but also for maintaining the functionality and attractiveness of this important transportation and hospitality hub.

Overall, the project is expected to improve living standards, promote equitable access to essential services, and enhance both the social and economic stability of South Bimini. By reducing reliance on private wells and unregulated water sources, the initiative will also advance long-term environmental sustainability and community well-being.

The upgraded infrastructure will allow for improved interconnection between South Bimini's water supply network and the broader island system, thereby reducing vulnerability to service disruptions and strengthening network redundancy and climate resilience.

In summary, the planned works in Airport Road, South Bimini represent a strategic investment in climate-resilient water infrastructure. The project will deliver enduring social, environmental, and public health benefits while reinforcing the island's capacity to support residents, tourism, and economic growth. By expanding access to safe potable water in one of Bimini's most critical corridors, the initiative supports national development goals and enhances the quality of life for the South Bimini community.

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	The Environmental planning and protection (Extension of application) order applies throughout The Bahamas, including all islands and cays.

(Extension of application) Order, 2020	
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 Airport Road 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 archeological 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. Under this component, site-specific risks such as dust emissions, noise, vegetation disturbance, localized erosion, and potential disruption to community access have been identified. These impacts are addressed through tailored mitigation measures, contractor supervision protocols, and site-level monitoring plans. Roles and responsibilities are clearly delineated between the WSC and its contractors, ensuring that the mitigation hierarchy is applied effectively, first avoiding impacts where possible, then minimizing, restoring, or offsetting residual effects.

The Airport Road corridor in South Bimini is a vital transportation link for residents, workers, and tourists. Not only is it the "main" road, but it is also the only road that leads directly from the airport to the ferry, with few side roads for residential communities. Its proximity to the airport, ferry terminal, and tourism-based businesses means even short-term disruptions may have notable effects.

Additionally, given the reliance on rain catchment potable water, delays in completing the mains extension risk prolonging water insecurity for the airport, residents and seasonal property owners. These social considerations elevate the urgency of timely execution, community engagement, and transparent communication, all of which are embedded in the stakeholder engagement and grievance redress provisions of this ESMP.

This ESMP also builds on the broader findings of the program's Strategic Environmental and Social Assessment (SESA), refining those recommendations for the specific site conditions, risks, and design features associated with the Airport Road water mains extension. Through this localized application of ESPS 1, the project aims to minimize residual environmental risks while maximizing long-term social and infrastructure benefits for Bimini's residents and visitors.

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

Although the works are relatively small in scale, ESPS 3 is applicable given the potential for local environmental disturbance during trenching and installation. The Airport Road is an inland, low-lying corridor with uneven, partially paved and rocky surfaces. These conditions lead to localized ponding during heavy rainfall, but there is no formal stormwater drainage system or significant surface runoff.

To align with ESPS 3, contractors will be required to implement resource-efficient practices 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 and Safety

ESPS 4 highlights the obligation to protect workers and surrounding communities from potential health and safety risks associated with construction and operations. In this project, that means ensuring traffic safety during pipe laying and equipment transport, minimizing dust and noise, and clearly communicating service disruptions. It also requires protocols for the safe handling and transportation of hazardous materials, measures to prevent the spread of communicable diseases (e.g., flu and respiratory illnesses), and plans for fire and life safety in worksites. 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 reduces community-level risks and enhances overall resilience to health and safety threats.

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

The potable water mains installation along the South Bimini Airport Road corridor triggers ESPS 6 due to the presence of native roadside vegetation and potential incidental habitat for common fauna. Although the alignment does not traverse any formally designated protected areas, Key Biodiversity Areas (KBAs), or Important Bird Areas (IBAs), it is flanked by naturally vegetated buffers that provide minor ecological functions, including soil stabilization and wildlife movement for non-threatened species such as lizards and birds.

Vegetation within the corridor consists primarily of low-lying coastal shrubbery and salt-tolerant groundcover typical of disturbed roadside environments. While no protected species have been identified within the project footprint, vegetation clearance or tree removal, if required, must comply with The Bahamas' national regulatory framework, including the Forestry Act (2010) and relevant DEPP permitting requirements.

The project's activities remain fully consistent with the objectives of ESPS 6, as the design limits vegetation disturbance to only what is necessary for trenching and access. No cumulative or long term biodiversity impacts are anticipated, and all environmental safeguards support post-construction revegetation and ecological restoration in line with best practice and legal requirements.

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 Airport Road corridor is sparsely developed, with naturally occurring vegetation on both sides. 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.

The social baseline assessment examines the existing demographic, infrastructural, and socioeconomic conditions within the Airport Road corridor and surrounding areas of South Bimini. It focuses on patterns of settlement, community infrastructure, access to basic services such as potable water, and local livelihoods that may be influenced by the project. The assessment also considers aspects of public health, safety, and equity to establish a foundation for evaluating the project's potential social impacts and benefits. The baseline assessment further supports the necessary foundation for identifying environmental and social risks and supports the definition of mitigation and monitoring measures in the ESMP.

The area primarily comprises open land and natural vegetation, with scattered residential and institutional structures located at a distance from the project alignment. Trenching will occur along the shoulder of the single carriageway road, which is bordered by naturally vegetated buffers. The lack of sidewalks or formal pedestrian pathways necessitates the implementation of clear safety measures, including designated walking paths, signage, and temporary barriers to protect workers and pedestrians during active construction periods. The corridor also presents environmental constraints that influence construction logistics, such as sandy and loosely compacted soils, the absence of a formal drainage system, and frequent surface water pooling during heavy rainfall.

From a social perspective, 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, and susceptible to contamination during storms or extended dry periods. By extending piped potable water through the Airport Road corridor, the project will enhance the quality, affordability, and security of water supply for residents, businesses, 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.

While there are no intersecting critical habitats, the area is prone to seasonal flooding due to the lack of drainage infrastructure, with soils composed primarily of loose sand and shell aggregate. No protected

flora or fauna were observed within the immediate project zone, although environmental management protocols remain necessary.

A review of historical disaster data indicated that Bimini experienced surge-related impacts during Hurricane Irma (2017), including damage to roads and private infrastructure. These factors have been incorporated in disaster risk planning and resilience design.

5.2 DEFINITION OF AREA OF INFLUENCE

This section defines the Direct and Indirect Areas of Influence (DAoI and IAoI) in South Bimini, specifically along Airport Road. 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. This includes the physical footprint of excavation, staging areas, pipe installation, excavated trench material, and access for machinery and workers.

Given the compact nature of South Bimini's infrastructure and minimal roadside development, the 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 Airport Road, the DAoI includes the partially paved corridor between the airport and the ferry terminal, 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, which will be located in the verge of the roadway.
- Temporary construction zones used for short-term activities such as excavated trench material.

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.

5.2.2 Indirect Area of Influence (IAoI)

The Indirect Area of Influence (IAoI) refers to areas where secondary or less immediate impacts may occur due to noise, vibration, dust dispersion, or traffic disruptions. For this project, the IAoI is defined as a 20-meter corridor from the trench alignment. From a social perspective, 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.

This area may experience:

- Intermittent exposure to noise and dust during trenching and backfilling activities;
- Temporary access limitations for road users and property owners;
- Visual impacts due to machinery movement and temporary road reinstatement works.
- In Airport Road, the IAoI includes the broader corridor connecting institutional and transportation infrastructure and any users along the roadside.

No critical habitats, protected areas, or sensitive ecosystems are located within the defined DAoI or IAoI for the project site.

5.3 SITE CONDITIONS ANALYSIS

The Airport Road in South Bimini is a minimally developed corridor that connects the island's airport to the ferry dock and nearby community facilities. The road is partially paved, with limited built infrastructure or dense residential development along the proposed water mains alignment. Surrounding land cover is primarily composed of native vegetation and open, undeveloped roadside areas, offering relatively unobstructed space for construction activities.

Site visits were conducted on July 15 and 16, 2025, to assess the physical and biological characteristics of the Airport Road corridor 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. 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.

5.4 DIRECT AREA OF INFLUENCE (DAOI) BASELINE

5.4.1 Topography and Erosion Potential

The topography of the Airport Road corridor in South Bimini is uniformly flat and low-lying, with ground elevations generally ranging from 0 to 2.5 meters above sea level. The corridor lacks natural elevation gradients and contains no discernible slopes or drainage channels. During the site visit conducted on July 2025, it was observed that the road surface is partially paved but degraded in several sections, with extensive potholes, cracks, and uneven edges (Photo 1). In areas where the surface is unpaved, compacted sandy and rocky material dominates the profile, contributing to poor water absorption and localized ponding following rainfall (Photo 1).

[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.

Photo 1. Segments of the Airport Road (Left: Paved road surface; Right: Unpaved road surface)

Given the flatness of the terrain, there is minimal risk of sediment transport through surface runoff. However, the lack of roadside drainage infrastructure and poor soil infiltration contribute to persistent waterlogging, which can impede construction equipment and increase the risk of trench wall instability, especially during or after heavy rain events (visible in right photo of Photo 1). While the erosion potential is low, the site remains vulnerable to shallow pooling that can delay backfilling and affect equipment staging.

Natural vegetation lines the road shoulders, and some of these areas include species listed under the Protected Trees Order (2021). These include common lowland native trees such as Sea Grape (*Coccoloba uvifera*), Gumbo Limbo (*Bursera simaruba*), and Brittle Thatch Palm (*Thrinax morrisii*), which are present among the natural lush vegetation within the wider road verge and serve important ecological functions, including soil stabilization. However, the narrow excavation footprint and alignment along previously disturbed road margins ensure that no protected tree species will be removed or impacted during trenching (Photo 2). Vegetation disturbance will be avoided where possible and managed in accordance with the Forestry Act (2010) and DEPP guidance.

Photo 2. Roadside photo showing roadway verge and low grass shrubs within the direct area of influence.

5.4.2 Geology and Soil Profile

The underlying geology of South Bimini, including the Airport Road corridor, is characterized by quaternary-age carbonate limestone, which forms the base of the island's geology. The surface layer consists of unconsolidated sandy soils with low organic content, typical of Bahamian coastal environments. These soils are light-colored, porous, and poorly cohesive, offering limited structural support and low compaction stability unless mechanically reinforced.

Observations from the July 2025 field visit confirmed that soils along the trench alignment are shallow and heterogeneous, with scattered rock fragments and loosely packed sand, particularly along the unpaved road shoulders (Photo 3). Due to this composition, excavation activities must be carefully phased and promptly backfilled to minimize trench collapse or soil displacement. Because of the flat terrain and absence of defined runoff pathways, sediment transport is not expected to be a significant issue. However, persistent water retention after rain events could affect soil bearing capacity and slow construction timelines if mitigation is not in place.

Photo 3. Photo showing unpaved road conditions, rocky substrate, loose packed sand material, and scattered rock fragments.

The corridor is largely free of fill material or anthropogenic waste, and no evidence of soil contamination or buried debris was observed during the site walk. While the immediate works zone does not intersect ecologically sensitive sites, the presence of protected tree species in the adjacent road verge underscores the importance of careful equipment movement and vegetation avoidance during trenching.

5.4.3 Hydrology

The hydrological regime of the Airport Road corridor in South Bimini is shaped by the island's flat topography, porous limestone geology, and shallow freshwater lens system. Field visits confirmed that the project area lacks formal surface drainage infrastructure. During moderate to heavy rainfall events,

surface water accumulates in low-lying, unpaved sections of the roadway and adjacent verges. Due to the compacted soil and limited gradient, these depressions often retain water for prolonged periods, sometimes lasting several hours to days, contributing to localized flooding, waterlogging, and general nuisance for vehicular access and material staging.

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 like Airport Road. These lenses are highly susceptible to salinization, particularly due to sea level rise, tidal movement, and surface contamination from anthropogenic activities.

The Airport Road does not intersect any visible watercourses, drainage canals, or mapped wetlands, nor does it fall within a designated stormwater catchment zone. However, its low elevation, averaging less than 2.5 meters above sea level, and underlying limestone substrate place it within the island's high water table zone.[3] 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. These conditions pose construction-phase challenges such as trench wall instability, compromised bearing capacity, and risks of backfill erosion or equipment access delays. While tidal flooding is not expected due to the inland location, persistent saturation demands a trench dewatering plan and adaptive construction schedule.

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.

[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

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**

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.[4] 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.

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.[5] 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.[6] 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.[7] 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. [8] 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

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

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

[6] 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/

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

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

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.[9]

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.[10] 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.[11]

Water infrastructure along Airport Road is functionally critical for Bimini's residents, local businesses, and emergency services, particularly during disaster recovery periods. Taken together, these physical, social, and ecological factors establish Bimini as a highly vulnerable location requiring careful planning and climate-informed infrastructure development. For projects like the Airport Road water mains installation, a comprehensive disaster and climate risk lens is essential to safeguard investments and ensure long-term functionality under future climate conditions.

5.4.5 Biotic Environmental Baseline

5.4.5.1 Flora

Vegetation in the direct area of influence is characterized by low-lying, coastal scrub species and herbaceous cover typical of disturbed roadside corridors in limestone-based environments. Field observations from the July site visit identified the following dominant flora species:

- *Chrysobalanus icaco* (Cocoplum)
- *Serenoa repens* (Saw Palmetto)
- *Cynodon dactylon* (Bermuda grass)
- Various ruderal species and invasive grasses along the road edge

Portions of the indirect area of influence, particularly undeveloped roadside vegetation beyond the trench zone, include native scrub thickets and *Casuarina equisetifolia* (Australian Pine), which is classified as invasive under the National Invasive Species Strategy (2013).[12]

The Protected Trees Order (2021) lists *Coccoloba uvifera* (Sea Grape), *Bursera simaruba* (Gumbo Limbo), and *Swietenia mahagoni* (West Indian Mahogany) as legally protected species. While *Coccoloba uvifera* was visually confirmed in the indirect zone, it does not fall within the construction footprint and is

[9] Pacific Disaster Center (PDC). (2019). *The Bahamas: Island Risk Profiles- Multi-Hazard Exposure and Vulnerability Assessment*. State of Hawaii, USA: Pacific Disaster Center.
[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] Government of The Bahamas (2013). National Invasive Species Strategy for The Bahamas. Ministry of the Environment and Housing.

not expected to be impacted by trenching activities. No protected trees will be removed. Should minor pruning become necessary, the Forestry Act and DEPP permitting requirements will apply.

Vegetation removal is expected to be minimal and confined to narrow, previously disturbed verges within the direct area of influence. No impacts are anticipated on intact vegetative buffers or canopy-forming species. Restoration of disturbed areas with native, salt-tolerant species will follow the backfilling and surface reinstatement phase.

5.4.5.2 Fauna

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

- *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

No evidence of protected terrestrial species, nesting grounds, or burrows, 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.

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 lagoons. 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 of the Airport Road corridor do not intersect any designated Protected Areas, Key Biodiversity Areas (KBA), or Important Bird Areas (IBA). Satellite imagery, spatial overlays, and references from the Bahamas Protected Areas Fund (BPAF) confirm the absence of mapped conservation zones within or adjacent to the works alignment (Annex I).

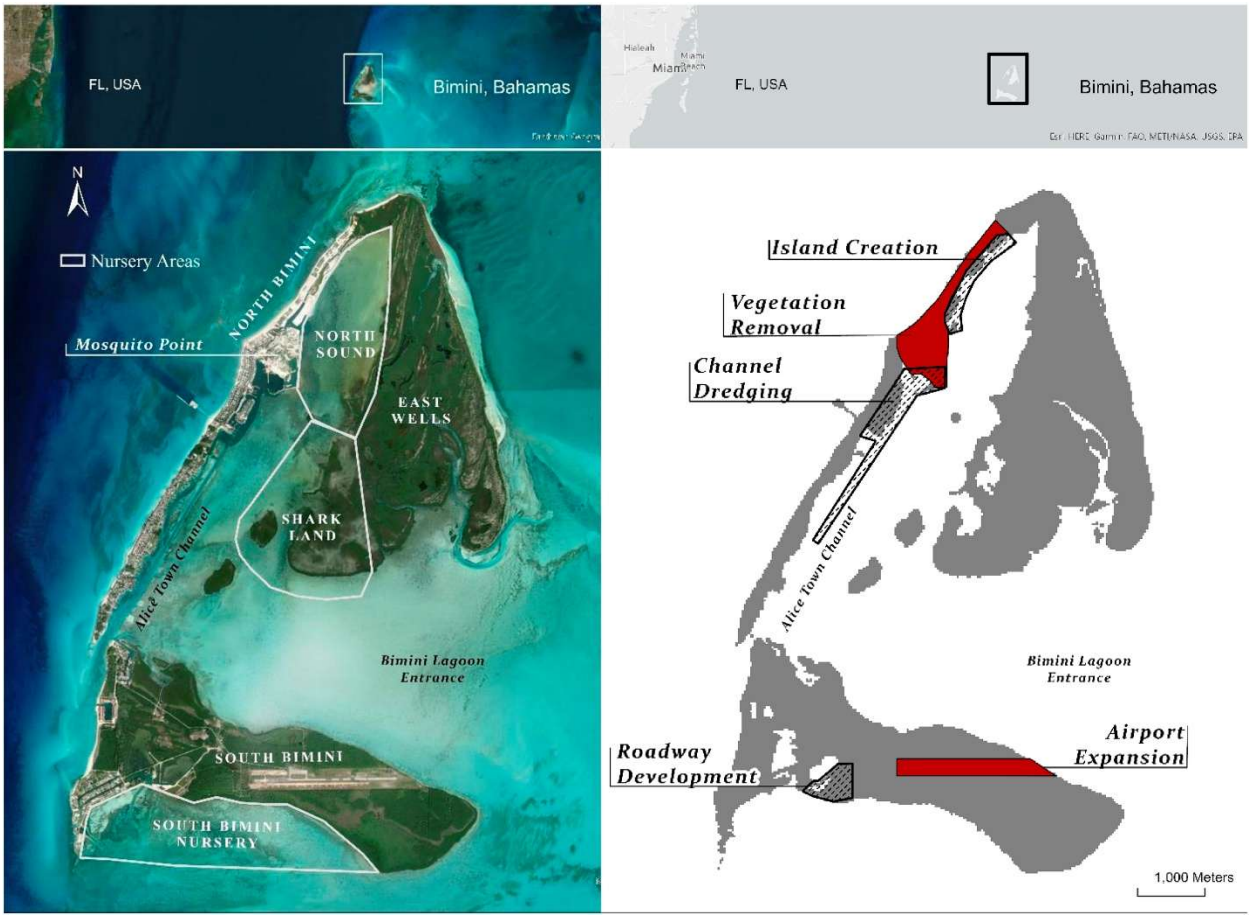
The closest ecologically sensitive site is the mangrove and coastal wetland system in North Bimini, classified as a high-priority conservation habitat under several national and international frameworks. However, this system is geographically separated from the Airport Road corridor and there is no existing literature that indicates any hydrologically connected.

While no critical habitats or endangered species are currently mapped along the Airport Road, recent research published in Facets (Knowles et al., 2024) provides valuable ecological context for Bimini and its surrounding cays. The study offers updated biodiversity assessments, including terrestrial species

[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

richness, coastal habitat classification, and preliminary spatial mapping of ecological communities in the Bimini region.[14] Although the Airport Road itself is not explicitly mapped in the study, it falls within the broader landscape examined and may share ecological characteristics such as native shrubland, coastal scrub vegetation, and informal wildlife movement zones. Notably, the study highlights that the construction of the South Bimini Airport and associated roadways beginning in 2019 involved significant terrestrial vegetation clearance and sediment infilling, which may have indirectly impacted nearby sensitive habitats, including the South Bimini lemon shark nursery (Figure 1). While the full extent of vegetation loss, particularly of mangrove and transitional scrub and its effects on adjacent seagrass beds has not yet been fully quantified, this context reinforces the ecological sensitivity of the surrounding environment and the need for careful management of any additional disturbance in the area.

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. Highlighted in red is the Airport Expansion (including the Airport Road) in South Bimini.[15]



[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

These regional insights supplement the local baseline and will be used to guide pre-construction reconnaissance and environmental sensitivity screening. In the absence of fine-scale habitat mapping for the works corridor, these data serve as a best-available proxy to anticipate potential ecological interactions.

No migratory routes, sensitive nursery habitats, or coral reef zones fall within the area of influence. While native flora and fauna are present, they are expected to be resilient to localized construction disturbance, particularly with mitigation and vegetative buffer practices in place. A pre-clearing walk-over and chance-find protocol, as outlined in the Fauna and Vegetation Management Plan, will help ensure that any unexpected ecological features are properly documented and managed. With these safeguards, no residual biodiversity risks are anticipated.

5.4.6 Summary of Environmental Baseline

The Airport Road corridor in South Bimini is characterized by low-lying terrain, sandy soils, seasonal rainfall patterns, and sparse coastal vegetation. Field surveys confirmed that the alignment traverses previously disturbed areas with limited ecological sensitivity and no intersecting wetlands or protected habitats. Vegetation consists primarily of native shrubs and grasses, with some naturally occurring protected tree species present in the indirect area of influence. The fauna observed or expected in the area represent common, non-threatened species with no evidence of nesting or sensitive habitats. Climate and hydrological conditions reflect Bimini's broader vulnerability to seasonal flooding and hurricanes, compounded by the absence of drainage infrastructure along the Airport Road. This context underscores the importance of site-specific safeguards to guide implementation and post-construction restoration.

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 or bottled water. 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).[16] 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.[17] This gender imbalance may be influenced by employment patterns related to tourism, fisheries, and construction, sectors that traditionally attract more male labor.

[16] 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

[17] 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

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.[18] 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**

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.[19] 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.

6.1.2 Access to water

The scope of this project is to improve the distribution of potable water across South Bimini, with a focus on the Airport Road corridor. There are four residential homes, two warehouse facilities and the South Bimini Airport and its associated facilities, located within the direct area of influence of the proposed works. At present, these structures are not connected to the island's water distribution system and rely instead on private groundwater wells for its water supply. These wells are shallow and vulnerable to contamination from saltwater intrusion, surface runoff, and seasonal variations in groundwater quality. As a result, the water available for airport operations often fluctuates in quality and reliability, posing potential challenges for sanitation, maintenance, and service delivery. In South Bimini there is a desalination plant that provides water supply to water infrastructure that is installed and connected to the plant.

The installation of the new 4-inch water mains along Airport Road will provide the buildings on the airport road with a safe, consistent, and sustainable source of potable water, addressing a longstanding infrastructure gap. Improved access to reliable water will strengthen the airport's operational efficiency, enhance health and hygiene standards for staff and passengers, and ensure compliance with aviation and public health requirements. In addition, this infrastructure upgrade will improve the island's overall

[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

resilience by ensuring that a critical facility such as the airport can maintain continuous service even during periods of environmental stress or supply disruption.

6.1.3 Transportation

The economy of South Bimini is largely anchored in tourism and related service industries, supplemented by small-scale fishing, artisanal activities, and local retail. The South Bimini International Airport is undergoing a major redevelopment via a public-private partnership valued at approximately US$ 80 million, which underscores the airport's growing importance in supporting tourism and connectivity for Bimini. The airport's recent improvements include apron expansion, new lighting systems and runway upgrades, aimed at increasing capacity for commercial flights and improving service standards.[20] While exact daily passenger figures are modest compared to large international hubs, the airport is slated to see greater traffic, including the announced nonstop U.S. service in 2026.

In the indirect area of influence of the Airport Road corridor, business operations include vacation homes and seasonal residences, boutique lodging, small restaurants and cafes, golf-cart rentals, fishing charters, and other tourism-support services (e.g., transport/shuttle, rental equipment). For example, golf cart rental companies are notable local enterprises near visitor arrival zones. Local supply chain activities such as food provisioning (seafood, local produce), small scale retail and craft sales also employ entrepreneurs and informal workers. The area's limited commercial infrastructure means most businesses are small, locally-owned, and highly sensitive to utility service reliability and potable water access. The proposed potable water mains extension in Airport Road consequently has strong relevance for business viability, cost reduction (less reliance on alternative water sources), visitor satisfaction (clean, reliable water for lodging/food service) and local entrepreneurial stability.

On the agriculture/farming side, while South Bimini's soils and lot patterns are not heavily devoted to large-scale farming, small-scale gardens, local fishers and service provisioning form part of the economic mix. The proximity to the airport and tourist transit flow means even modest businesses (snack bars, shuttle services, craft vendors) rely on infrastructure services, sanitation, and periodical tourist peaks. Clinics, churches and small community institutions also form part of the service economy, relying on safe water, sanitation and stable utilities to maintain operations and community health.

The airport serves as a key stakeholder and beneficiary of the proposed mains extension. The improved potable water infrastructure will support airport operations, such as restrooms, food services, janitorial, and fire-suppression systems, thereby contributing to both service quality and crisis readiness. At the same time, any construction activity along the access road must account for the airport's operational rhythm, peak arrival/departure times, and the need to maintain reliable vehicular access to the terminal, taxi services, and freight or logistics functions. However, the installation of the water infrastructure is not expected to disrupt the daily business/operations or economy of the Airport.

While specific household composition data for South Bimini are limited, census trends across The Bahamas indicate that approximately 42–45% of households are female-headed, often with women serving as the primary economic providers. In smaller Family Island communities, female heads of household may face greater challenges accessing stable income, water, and sanitation services due to seasonal employment patterns, higher household dependency ratios, and limited access to affordable

[20] Bahamasnational.com

alternative water sources. For these reasons, women, particularly single mothers and female-led households, may be considered socially vulnerable in terms of affordability, time spent managing household water needs, and exposure to public-health risks associated with unreliable supply.

Given that there are no officially designated vulnerable populations (such as displaced persons or at-risk minorities) in Port Royal or along Airport Road, it is not necessary for the project's social management strategy to include gender-sensitive engagement, affordability considerations, or **s**pecial communication measures for elderly or low-income residents.

7 IDENTIFICATION AND ASSESSMENT OF ENVIRONMENTAL AND SOCIAL IMPACTS & RISKS

This section presents an identification and assessment of environmental and social impacts associated with the construction and operation of the proposed water mains along the Airport Road 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, reports, site-specific baseline data, and relevant national and international safeguards and 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 ESA follows the standardized methodology outlined in the SESA for the program. 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 conditions. Minor emissions from construction equipment.	No emissions; water mains are underground and passively operated.	Low
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	Generation of excavated spoil, 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 Airport is expected to generate substantial positive social impacts for the island. As the primary gateway for air travel, the airport plays a vital role in Bimini's tourism-driven economy. A reliable water supply will improve hygiene, sanitation, and operational standards at airport facilities, directly enhancing the visitor experience, staff working conditions, and service reliability.

In the long term, these improvements can attract repeat visitors, increase tourism revenue, and encourage private investment in nearby businesses and services. 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 traffic and pedestrian accidents, temporary noise, dust, and minor disruptions to access for airport staff, travellers, and nearby businesses. 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
Traveler and Visitor Experience	Minor inconvenience due to noise or construction visibility	Enhanced visitor experience from improved facilities and services	**None**: construction impacts are temporary

Business Operations (On-site Vendors)	Disruption to foot traffic or utilities near airport areas	More consistent water for cleaning, food service, and compliance with safety standards	**Low**: with proper scheduling and notice
Community Livelihoods	None directly, but small disruption to airport flow could have ripple effects	Enables future 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 along the Airport Road corridor 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 relatively small and the operational design is passive, Bimini's low-lying topography, porous soils, and shallow groundwater table present environmental sensitivities that require appropriate planning and mitigation. Identified impacts are expected to be localized, temporary, and reversible, primarily limited to the direct area of influence. Indirect environmental risks to adjacent vegetation or undeveloped land outside the direct works zone are considered low, given the localized nature of construction and the absence of any protected habitats or ecological buffer zones. Impacts will be managed through standard good-practice site controls to prevent unnecessary disturbance beyond the trench alignment.

No significant long-term environmental impacts are anticipated during the operational phase, as the installed water infrastructure will be subterranean and non-emitting. Additionally, the trench alignment avoids ecologically sensitive habitats, and no protected flora or fauna will be directly affected by the works.

All identified impacts have been evaluated in terms of magnitude, duration, probability, and residual risk. Appropriate mitigation and monitoring measures are incorporated into the ESMP to ensure compliance with national environmental regulations and the IDB's ESPS.

7.3.1 Air Quality: Dust and, Emissions

Temporary degradation in air quality may occur during trenching and earthworks due to dust emissions from dry, sandy and rocky soils and exhaust from construction vehicles and equipment. While the Airport

Road corridor does not intersect densely populated residential areas, it is a visible transportation link to the airport and ferry terminal, meaning that airborne particulates may still create minor nuisances for travellers, workers, and passersby.

Mitigation Measures: 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**.

In terms of classification, the air quality impacts are assessed as low in magnitude, short-term in duration, and highly probable during construction activities. Impacts are localized to the direct work zone and are considered reversible upon demobilization. No residual air quality impacts are expected during the operational phase, as the water mains are passive underground infrastructure that does not emit pollutants. There are also no known sources of legacy contamination or hazardous emissions in the area of influence that could pose cumulative risks.

7.3.2 Noise and Vibration Impacts

Noise and vibration will result from excavation equipment, pipe laying activities, vehicle movement, and general site operations. Although the Airport Road is not adjacent to major residential clusters or tourism establishments, intermittent noise may affect workers and travellers accessing nearby transport hubs.

To minimize nuisance, high-noise activities will be limited to standard working hours, and advance notice will be provided to adjacent users. Given the limited number of nearby receptors, the risk of cumulative noise impacts is **low**.

In line with the assessment methodology, noise and vibration impacts are classified as low to moderate in magnitude, temporary in duration, and highly probable during the construction phase. The impact will be confined to the direct area of influence and is considered fully reversible upon completion of works. No operational noise or vibration impacts are expected, as the installed infrastructure is inert and does not involve mechanical operations post-installation.

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

The Airport Road corridor is prone to water pooling during heavy rainfall due to its degraded surface and absence of formal drainage infrastructure. While the project does not involve groundwater abstraction or direct discharge into water bodies, unmanaged surface runoff during construction could lead to sediment-laden water accumulating in roadside ditches or low-lying areas.

This impact is especially pronounced in areas where shallow groundwater tables coincide with compacted or impervious road surfaces, limiting infiltration. These conditions, combined with excavation works and spoil stockpiling, may exacerbate waterlogging or create temporary obstructions to overland flow. Although the project does not traverse coastal wetlands or freshwater bodies, stagnant water in work zones may reduce soil stability and impair construction schedules.

Based on the environmental impact assessment methodology, potential impacts to water resources during construction are considered low to moderate in magnitude, short-term in duration, and highly probable, particularly during the rainy season. Impacts will be localized to the direct work zone, with no significant residual effects expected during operation. Once installed, the water mains will function passively and do not involve discharge or drawdown, meaning no hydrological interference will occur in the operational phase. The long-term effect is anticipated to be neutral or slightly positive, due to improved resilience and access to potable water in a climate-sensitive corridor.

7.3.4 Soil: Erosion, Contamination, and Compaction

The soil along the Airport Road corridor in Bimini is predominantly sandy, coarse, and loosely compacted, as observed during field visits. These characteristics present moderate vulnerability to erosion and surface instability, particularly following heavy rainfall. The unpaved road surface is already prone to ponding and the formation of potholes, which may worsen if trenching activities are not carefully managed.

Excavation and backfilling works in this area must be approached with caution. Unprotected trenches can quickly erode or collapse, while exposed spoil piles may be dispersed by wind into the surrounding vegetated areas, reducing site stability and potentially compromising road access for vehicles and emergency services. Compaction of the surrounding soil, particularly on unpaved road shoulders and staging areas, may also occur due to repeated vehicle movements.

In terms of classification, soil-related impacts are moderate in magnitude, short to medium in duration, and highly probable across most sections of the alignment. Additionally, in terms of soil instability and trench collapse, there is a moderate impact, affecting the direct area of influence and likely to occur without reinforced excavation. This effect of soil instability and trench collapse is temporary but may lead to material loss or project activity delays. Overall, impacts are limited to the direct area of influence and are reversible with appropriate stabilization, backfilling, and restoration. Operational impacts are expected to be negligible, as no active equipment or emissions will be introduced, and the soil will remain undisturbed post-installation.

7.3.5 Waste Management

Construction activities along the Airport Road corridor in Bimini are expected to generate a variety of waste streams, including excavated spoil, minimal vegetation debris, packaging from construction materials, and domestic waste from site personnel. Although the project footprint is linear and confined to the roadside, the absence of formal waste containment, designated collection points, or municipal sanitation services in the area increases the risk of improper on-site waste accumulation.

Due to the unpaved, sandy terrain and lack of stormwater drainage infrastructure, improperly managed waste, especially lightweight or fine particulate materials such as plastic, packaging, or loose sediment, could disperse into adjacent vegetated areas during wind or rainfall events. Waste left on-site for extended periods may also attract pests, compromise the natural appearance of the roadside environment, or block vehicular and pedestrian access along the corridor. Inappropriate disposal of construction-related waste may also indirectly affect the aesthetic quality and ecological function of roadside vegetation.

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 impacts of construction waste are expected to be low in magnitude, as the waste streams generated are non-toxic and predictable. However, without structured management, impacts may be moderate in likelihood and localized to the direct area of influence. The duration of impacts will coincide with the active construction period, and while they are reversible, timely removal and responsible handling of waste will be critical to avoid prolonged site-level disturbance.

7.4 BIOLOGICAL ENVIRONMENT IMPACTS

This section examines the potential environmental impacts of the Airport Road infrastructure works on local biological resources, including inland vegetation, common terrestrial fauna, and general habitat conditions. The corridor lies inland along South Bimini's Airport Road and is not located within or adjacent to any designated ecological reserves, KBAs, or IBAs. However, the alignment is flanked by naturally occurring roadside vegetation, including native shrubs, grasses, and occasional protected tree species. These vegetated margins contribute to ecological stability, providing limited habitat functions and erosion control in an otherwise disturbed and partially paved area.

The direct area of influence includes the trenching corridor and immediate workspace required for water mains installation. The indirect area of influence comprises adjacent vegetated buffers, which may be subject to minor, short-term edge effects. Using the established methodology, potential impacts are evaluated based on magnitude, duration, probability, spatial extent, and reversibility. While the biological value of the work zone is considered low to moderate, due care is required to avoid unnecessary vegetation loss or fauna disturbance. 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

The Airport Road alignment is flanked by low-lying coastal vegetation, including thick roadside shrubbery and scrub. Site inspections confirm a dense but relatively uniform vegetative buffer along the roadway, characterized by salt-tolerant native plants, grasses, and woody species adapted to periodic exposure to wind and salt spray. The vegetation in this area is best categorized as Coastal Scrub and Shrubland, a formation typically composed of drought- and salt-resistant plant species found on sandy or rocky substrates near the shoreline.[21] This vegetation type plays an important role in stabilizing soil, filtering runoff, and supporting habitat continuity in fragmented coastal zones. While no rare or endangered flora were observed, this assemblage represents a typical yet ecologically important component of the coastal landscape in Bimini.

Given the density and continuity of this vegetation, trenching and equipment staging must be carefully planned to avoid unnecessary clearance, especially on the vegetated shoulder. A buffer should be maintained between trenching works and highly vegetated setbacks wherever possible, and any unavoidable removal must be minimized and documented. If any protected trees or plant species are identified during pre-construction walkthroughs, the contractor must comply with national permitting requirements under the Forestry Act (2010) and the Protected Trees Order (2021), and coordinate with DEPP for guidance.

Revegetation will be required in areas where vegetation is disturbed. Contractors should prioritize the use of native species already present along the corridor. With these safeguards in place, impacts to flora are expected to be low and localized, with full recovery anticipated post-construction.

The anticipated impact to flora is considered low in magnitude, as vegetation removal will be minimal and largely confined to already disturbed areas. Impacts will be short-term, occurring only during the active construction phase, and are highly probable given the linear nature of the works.

[21] 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.

However, the spatial extent is localized to the direct work zone, and impacts are fully reversible through natural regeneration and revegetation efforts.

7.4.2 Fauna and Wildlife Disturbance

No critical habitats, nesting colonies, or known wildlife corridors have been identified within the immediate project footprint, the natural buffer along the roadside offers shelter and movement zones for local fauna, particularly during early morning or post-rain periods when animal activity may increase.

Construction activities, especially site clearance, trenching, and movement of heavy equipment, may temporarily disturb these animals through noise, ground vibration, and disruption of their normal behaviour. However, due to the linear nature of the works and the relatively undisturbed vegetated shoulder that can act as a refuge, the scale of disturbance is expected to be minor and reversible.

To minimize impacts, contractors must implement basic fauna protection protocols, and all personnel must be instructed to avoid interaction with wildlife, and activities such as hunting, trapping, or feeding of animals are strictly prohibited. In the event that nests, burrows, or injured animals are encountered, work must be paused and the incident reported to WSC and the DEPP for guidance.

The potential impacts to fauna are expected to be low in magnitude and short in duration, limited to the construction period. While fauna encounters are moderately probable, the spatial extent of impact is restricted to the direct work zone and adjacent vegetation, with no expected disruption to broader wildlife populations. Impacts are considered reversible, with wildlife likely to return to the area once construction activities conclude.

7.5 SOCIAL IMPACTS

7.5.1 Community Access and Mobility

Temporary and localized access restrictions may occur during trenching, pipe installation, and backfilling along the Airport Road corridor. 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 the Airport Road 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]:

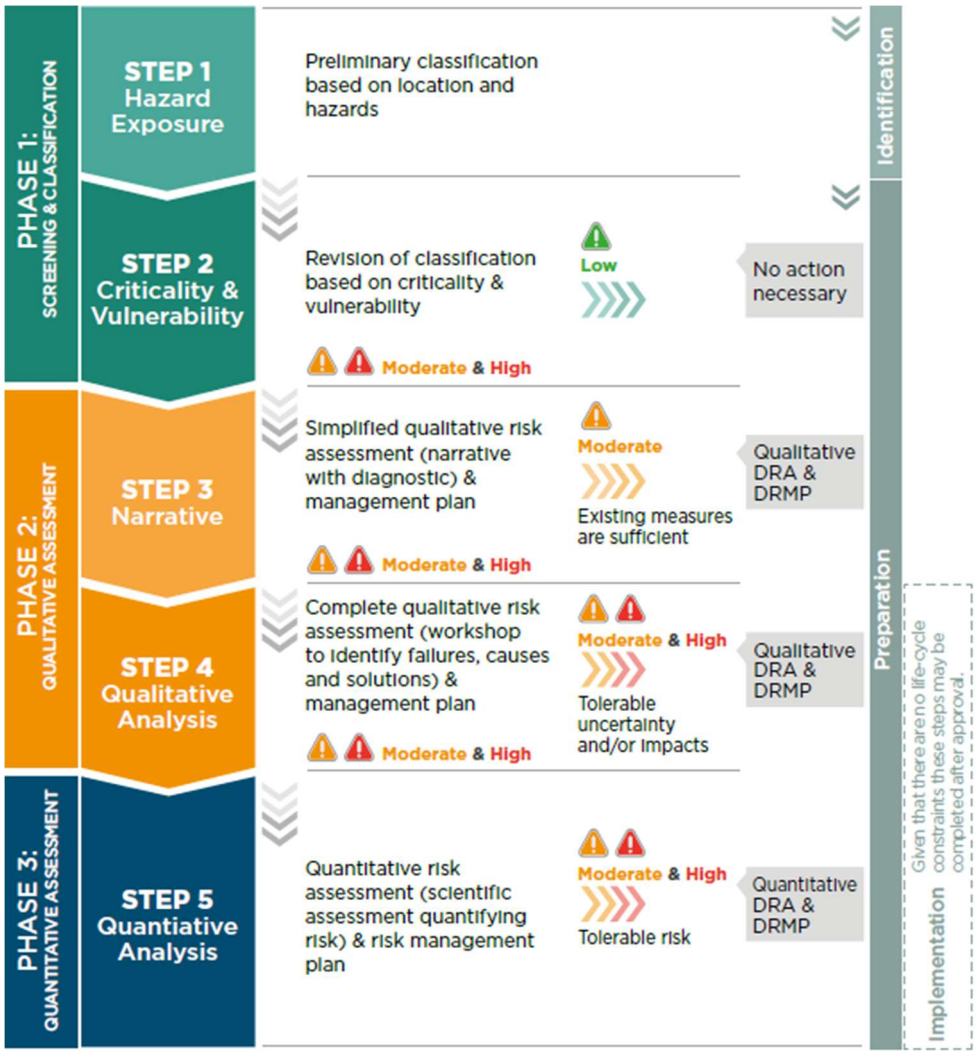
- **Hazard Exposure**: preliminary classification based on location and hazards
- **Criticality and Vulnerability**: revision of classification based on criticality and vulnerability

[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

- **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.

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



[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 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.

8.2.1.1 Step 1: Hazard Exposure

The Airport Road water mains project in South Bimini is located in a low-lying coastal area with limited drainage infrastructure, unpaved surfaces, and sandy, loosely compacted soils. These physical characteristics, combined with the region's exposure to climate hazards, create heightened environmental and disaster-related risks, particularly during the Atlantic hurricane season. The project is also exposed to occupational safety risks such as heat and trench instability, which require proactive mitigation.

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 Airport Road Water Mains works

Hazards	Cause	Potential Impacts	Hazard Risk Level
Flooding and Stormwater Accumulation	Flat terrain, lack of drainage, compacted sandy soils	Water pooling, trench collapse, equipment delays, restricted site access, increased vector risks	Moderate
Tropical Cyclones and Storm Surge	Coastal location in hurricane belt, seasonal storm activity	Wind damage, heavy rainfall, debris hazards, construction shutdown, risk to worker and asset safety	High
Extreme Heat	Seasonal temperature rise, limited shade or cooling	Heat stress or dehydration among workers, reduced productivity, health and safety concerns	Moderate
Soil Erosion and Trench Collapse	Sandy, loose soil; rainfall during excavation	Unstable trench walls, sediment dispersal, delays in construction, risk of injury	Moderate

While the project does not face direct exposure to marine ecosystems or wave action, secondary storm impacts, such as runoff and waterlogging, must still be addressed through structural and non-structural preparedness measures, as outlined in the Disaster Risk Management Plan (*Section 6.1.2*).

The hazard risk assessment indicates that tropical cyclones and associated storm impacts represent a high risk to the Airport Road works, given the area's location within the Atlantic hurricane belt and the vulnerability of exposed construction activities to wind, rainfall, and debris. Other risks, including flooding, trench collapse, and extreme heat, are rated as moderate, with potential to delay construction, affect worker safety, and degrade site conditions. Although none of these are expected to cause irreversible damage, they require targeted mitigation strategies to reduce operational disruptions and safeguard environmental integrity.

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). Together, these measures strengthen the climate resilience, environmental protection, and operational reliability of the Airport Road water supply infrastructure.

8.2.1.2 Step 2: Project Criticality and Vulnerability

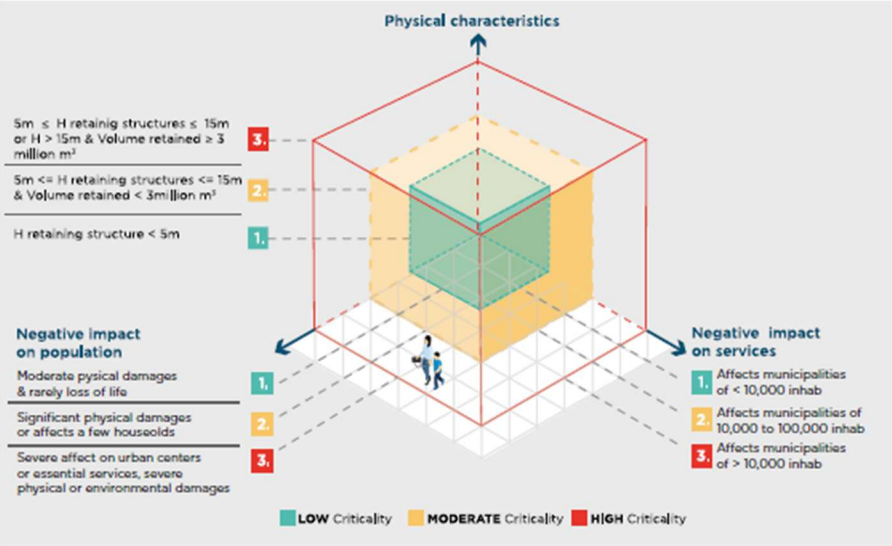
The Airport Road corridor, though not highly urbanized, provides critical connectivity between the South Bimini airport, ferry terminal, and residential areas.

Failure or delay in the water mains installation could:

- Delay improvements in potable water access, especially for communities currently dependent on rainwater catchment, bottled water, or private wells.
- Disrupt emergency response or evacuation during storm events if road access is compromised.
- Increase costs associated with project delays, material loss, or equipment exposure if works are not timed with weather patterns
- Exacerbate public health vulnerabilities, particularly in the event of prolonged water insecurity post-disaster.

- .

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 Airport Road potable water mains extension will serve a small segment of the South Bimini population. In the event of a system failure or temporary disruption, few inhabitants would be affected. Water supply interruptions would be localized and of short duration, with rapid restoration possible through existing operational protocols. Based on these characteristics, the **impact on service functionality is classified as low (**Table 7**)**.

8.2.1.2.2 Thresholds for Dimension 2: Impacts on Population and Environment

Given the project's limited scale, linear alignment along a previously disturbed roadside, and absence of nearby sensitive habitats, any equipment or installation failure would have minimal consequence for the population or surrounding environment. The infrastructure does not intersect any protected ecological areas, and water spill or leakage risks are minor and easily contained. Based on these characteristics, the **impact on population and environment is classified as low (**Table 7**)**.

8.2.1.2.3 Thresholds for Dimension 3: Physical Characteristics

The proposed installation consists of underground PVC mains that do not involve mechanical or electrical components. Operation is passive, requiring only periodic maintenance such as valve checks and pipeline flushing. No complex equipment or skilled daily operation is needed. As such, the **physical characteristics are classified as low**, reflecting the straightforward nature of maintenance tasks rather than any technical complexity. The primary threats to these installations are floods and strong winds, which may damage exposed elements of piping such as fire hydrants, valves, and stream crossings. These risks do not pose direct and significant threats to the community's life. There are no anticipated

[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

emergency situations that would immediately endanger community health or cause irreparable damage to biodiversity and natural environments. **Thus, the overall risk to the system is rated as low (**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 Moderate, 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 criticality is rated as Low.

Considering the hazard levels identified, the criticality and vulnerability estimated for the infrastructure's interventions, and the level of risk exacerbation, a Moderate Risk classification is adequate.

Climate change has been considered in relation to the potential intensification of extreme rainfall, storm surge, and hurricane events. These risks are relevant due to the road's low-lying topography and poor drainage conditions, which may amplify flooding and access limitations during the rainy season.

The following design considerations to manage the risks were identified:

- Trench reinforcement and erosion control during construction;
- Secure staging and equipment protocols for hurricane season;
- Worker hydration stations and heat protocols;
- Use of low-permeability backfill materials to reduce water intrusion.
- The following considerations to address exacerbation of risk were identified:
- Phased construction to avoid peak storm periods;
- Pre-storm checks and on-site drainage controls;
- Adherence to the Disaster Risk Management Plan (DRMP) outlined in Section 6.1.2.

No significant gaps were identified. The main uncertainty relates to unpredictable weather fluctuations during the construction period, which will be addressed through flexible scheduling, site monitoring, and coordination with local emergency protocols.

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 adequately addressed through the existing mitigation measures, as outlined in the ESMP and the project's Disaster Risk Management Plan (DRMP) (*Section 6.1.2*). However, continued monitoring is recommended during the rainy season, and adaptive management should be maintained in case hazard conditions intensify.

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 the Airport Road 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 ESA.

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.

Table 8. Disaster Risk Mitigation Measures for Airport Road (Access to Piped Water Supply)

Hazard Type	Measure Description	Project Phase	Type of Measure	Responsible Entity
Flooding / Surface Water Accumulation	Site selection for washouts, valves, and hydrants in areas of lowest surface water risk	Design	Structural	WSC Design Team, Contractor
	Anchor and tether exposed components (e.g., hydrants, surface valves) to prevent movement during water accumulation	Construction	Structural	Contractor, WSC
	Reinforce slopes and verges to control erosion and surface runoff	Construction	Structural	Contractor, verified by WSC
	Implement routine drainage maintenance along the trench corridor to prevent blockages and pooling	O&M	Non-Structural	WSC, PEU
Extreme Rainfall / Soil Erosion	Minimize open trench lengths during heavy rain season; schedule works accordingly	Construction	Non-Structural	Contractor
	Cover stockpiles and stabilize disturbed areas with native vegetation	Construction	Structural	Contractor, WSC supervision

Tropical Cyclones / Storm Surge (Indirect)	Secure materials and equipment pre-storm; activate contractor storm preparedness checklist	Construction	Non-Structural	Contractor, WSC
	Install thrust blocks and concrete reinforcements at pipeline joints to reduce buoyancy risks	Design	Structural	WSC Design Team, Contractor
Heat Stress (Occupational)	Adjust work hours to avoid peak sun; provide shaded rest areas and hydration	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	Construction	Non-Structural	Contractor
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

The Environmental and Social Impact Assessment for the proposed water mains installation along the Airport Road corridor in South Bimini identifies generally low, short-term, and manageable impacts during construction, with long-term social and environmental benefits once operational. The main environmental effects anticipated include temporary dust generation, noise, soil disturbance, minor vegetation clearance, and waste generation from excavation and equipment use. These impacts are localized and reversible, with mitigation measures such as dust suppression, erosion control, waste management, and limited vegetation removal ensuring low residual risk. No protected habitats or species will be affected, and the operational phase will have negligible impacts since the water mains will be underground and non-emitting.

Socially, the project will deliver significant positive outcomes by improving potable water access for the South Bimini Airport and surrounding areas, enhancing hygiene, sanitation, and service reliability critical to the island's tourism economy. Temporary construction-related inconveniences, such as minor access restrictions, dust, noise, and traffic disruption, will be minimized through phased scheduling, signage, and stakeholder communication. Occupational health and safety risks will be managed through proper safety training, PPE use, and heat stress protocols. In the long term, the project will improve public health, visitor experience, and access to water supply.

The Disaster and Climate Change Risk Assessment classified the project as moderately vulnerable due to its location in a flood-prone coastal zone, with potential hazards including flooding, trench collapse, tropical storms, and heat exposure. However, risks are limited to the construction phase and can be

effectively managed through the Disaster Risk Management Plan (DRMP), which includes drainage maintenance, reinforced slopes, storm preparedness, and worker protection measures. Overall, the project is environmentally sound, socially beneficial, and climate-resilient, with no significant residual impacts expected.

9 ENVIRONMENTAL & SOCIAL MANAGEMENT PLAN (ESMP) FOR BIMINI AIRPORT ROAD 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 Bimini Airport Road addresses distinct environmental characteristics, construction contexts, and levels of sensitivity.

The ESMP 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.

Key environmental risks addressed in this ESMP include:

- Air and dust emissions and sandy terrain;
- Soil erosion, runoff, and sediment control, particularly during the rainy season;
- Noise and vibration impacts near the Airport Road;
- Waste generation and legacy contamination;
- Disturbance to flora and fauna, including protected species and vegetated verges;
- Flood and storm water sensitivity in low-lying or poorly drained areas such as Bimini's Airport Road.

Key social risks addressed in this ESMP include:

- Community access and mobility
- Road and traffic impacts;
- Occupational and Community health and safety;
- Community information and participation
- Coordination with service providers
- Chance Find Procedure

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;
- 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	WSC	-
Operation	Operation and maintenance of the water and sewage infrastructure	WSC	WS	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 Measures	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.	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	As needed, within 5–7 days of infraction

		required before resumption of work.	
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 and community health and safety, and ensures preparedness for potential emergencies during 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 labeled 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
Site demobilization and cleanup	Contractors will remove waste, signage, and temporary structures at the end of each work phase,	Delay handover sign-off; require photographic proof of cleanup.	End of construction at each site	Contractor; verified by WSC

	restoring the area to pre-existing condition.			

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
Site demobilization compliance	Complete removal of equipment, signage, waste, and restoration performed	Final site walkthrough with photographic evidence	Contractor; verified by WSC
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 adverse environmental impacts of airborne dust, vehicle emissions, and construction-related noise and vibrations during water mains installation. This is particularly critical near the airport, the ferry terminal and commercial and residential infrastructure in Bimini.

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 minimize noise emissions and environmental impact.	Brief site staff; monitor and issue reminders; document repeated non-compliance	Continuous monitoring	Contractor Site Manager/Supervisor

9.5.1.2 Monitoring, Indicators, and Responsibilities

Monitoring Parameter	Indicator	Method/Frequency	Responsible Entity
Dust suppression	Surfaces visibly damp; no airborne dust during works	Daily field inspections; photographic records	Contractor

Equipment emissions compliance	Equipment maintenance logs up-to-date; low visible emissions	Weekly review of logs; visual spot checks	Contractor
Noise levels 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/Contractor
Stakeholder engagement	Notices distributed to specify construction schedule; communication records maintained Consideration will also be given to vulnerable groups and methods of engagement	Reviewed before noisy works; community feedback log maintained	WSC
Complaint resolution	Grievances logged, investigated, and resolved within timeframe	Grievance log updated weekly; monthly reporting to WSC	WSC

9.6 EROSION CONTROL PLAN

Objective: The objective of this plan is to prevent soil erosion, sedimentation, and runoff-related environmental degradation at all water mains construction sites. This includes protecting natural drainage patterns, minimizing soil displacement, and ensuring that sediment controls are effective, particularly following heavy rainfall events. These measures are critical in Bimini, where trenching and soil exposure are expected directly along low-lying roadways.

Summary: Excavation and earth movement present short-term risks of soil erosion. Without proper controls, these impacts could result in environmental degradation. This plan outlines proactive measures for minimizing exposed soil, stabilizing stockpiles, and protecting vulnerable areas.

9.6.1.1 Management Measures

Action Area	Management Measure	Corrective Action if Deviations Occur	Timeline	Responsible Entity
Phasing of works	Phase excavation and trenching to limit the size and duration of exposed soil areas	Adjust work plan; re-sequence activities to reduce open areas	Weekly planning and review	Contractor; verified by WSC
Disturbance area management	Clearly delineate work zone boundaries using cones	Re-mark zone; remove equipment or materials outside boundary	Prior to works and weekly inspection	Contractor Site Supervisor
Excavation limits	Confine all activities to within marked work area	Halt works and retrain crew; document deviation	Continuous during trenching	Contractor

Structural erosion controls	Install and maintain berms, silt fences, and diversion drains at appropriate locations and as needed	Repair or replace controls immediately after damage or failure	Pre-mobilization and post-rainfall events	Contractor; verified by WSC
Erosion control maintenance	Inspect and maintain control structures in good working condition throughout project	Document repairs in erosion control logbook; re-inspection	Weekly and after rainfall >10mm	Contractor; monitored by WSC
Stockpile protection	Cover exposed soil or sand stockpiles using tarpaulin or vegetation	Apply new coverings; relocate stockpiles if drainage is obstructed	Daily during excavation period	Contractor
Drainage and runoff	Store loose materials on non-erodible in secure areas; prevent sediment-laden runoff	Relocate materials; sweep and clean affected areas	Ongoing; especially before forecasted rain	Contractor
Road and drain inspection	Inspect road edges for sediment accumulation	Clean within 24 hours	After ≥10mm rainfall or weekly	Contractor
Vegetation preservation	Avoid clearing outside demarcated work zones	Replant or stabilize exposed soil with native vegetation	Immediately after works	Contractor; verified by WSC
Logbook and photo records	Maintain erosion control documenting incidents and occurrence in logbook with inspection notes and photo evidence of implementation and repairs	Update records; provide documentation to WSC	Weekly updates and monthly reporting	Contractor; submitted to WSC

9.6.1.2 Monitoring, Indicators, and Responsibilities

Monitoring Parameter	Indicator	Method/Frequency	Responsible Entity
Erosion control structures	Berms, silt fences, and drains installed and functioning (as needed)	Visual inspection weekly and after ≥10mm rainfall in 24 hour period	Contractor; verified by WSC
Work phasing and trench exposure	No large or prolonged open excavation areas observed	Weekly inspection with photo records in logbook	Contractor; verified by WSC
Sediment containment	No sediment runoff beyond site boundaries	Field checks after rain and daily during excavation	Contractor
Logbook and documentation	Erosion control documented; includes photos and corrective actions	Weekly review and monthly submission	Contractor; reviewed by WSC
Vegetation protection compliance	No unnecessary clearing observed outside approved work zones	During layout and weekly verification	Contractor; verified by WSC

Sediment removal	Roads and drains cleared of visible sediment within 24 hours of rainfall	Checked post-rain; removal documented in logbook	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 along the Bimini Airport Road corridor 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: The Bimini Airport Road alignment presents low ecological risk, with no protected areas or critical habitats intersecting the work zone. Vegetation is limited to roadside coastal scrub and shrubland, including salt-tolerant native shrubs and grasses typical of The Bahamas' coastal ecosystems. Impacts will be confined to the trench line, with no tree removal expected. Contractors must avoid unnecessary vegetation disturbance, maintain no-go zones, and allow incidental fauna to vacate naturally. Mitigation focuses on preserving roadside buffers, minimizing clearing, and enforcing good housekeeping throughout the works.

9.7.1.1 Management Measures

Action Area	Management Measure	Corrective Action if Deviations Occur	Timeline	Responsible Entity
Vegetation boundary marking	Clearly flag the trench alignment and limit vegetation removal to that footprint	Reflag work zones; retrain workers on buffer protocols	Pre-construction	Contractor; verified by WSC
Vegetation protection	Preserve roadside vegetation buffers and avoid unnecessary clearing beyond trench alignment	Stop works; rebrief crew; report deviation to WSC	During site prep	Contractor
Vegetation Storage	Store the topsoil (if possible) separately for ground leveling, respecting the edaphic sequence.	Report to WSC; log incident; reinforce protocol with workers	Continuous during works	Contractor Site Manager; WSC
Minimal habitat disruption	Allow incidental fauna to vacate naturally; avoid intentional harm or relocation	Report to WSC; log incident; reinforce protocol with workers	Continuous during works	Contractor
Buffer integrity during works	Avoid storage of materials, machinery, or waste within vegetated areas or soft verges	Relocate materials; clean up area; issue reminder to site crew	Continuous	Contractor Site Manager; WSC

Restoration of disturbed areas	Backfill and regrade any cleared zones not needed post-construction; allow natural revegetation	Inspect site; regrade or reseed if erosion observed	Post-construction	Contractor; reviewed by WSC
Restoration of disturbed areas	The Contractor must implement a revegetation scheme for zero net loss of vegetation, subject to the WSC/DEPP/Forestry approval. A 3:1 compensation ratio for tree removal is required.	Adjust planting plan; submit revised restoration plan to WSC/DEPP/Forestry	Post-construction	Contractor; approved by WSC/DEPP/Forestry
Restoration of disturbed areas	Strictly prohibit the introduction of invasive species in revegetation activities.	Remove invasive species; retrain revegetation crew	Continuous	Contractor
Biodiversity protection	Ensure all personnel receive proper training in identification and safeguarding of native flora and fauna, as well as protocols for dealing with potentially hazardous animals.	Conduct refresher training; document attendance	Pre-mobilization and refreshers	Contractor

9.7.1.2 Monitoring, Indicators and Responsibilities

Monitoring Parameter	Indicator	Method/Frequency	Responsible Entity
Vegetation clearance limits	Trenching confined to flagged boundaries; no over-clearance observed	Weekly site inspections; photo documentation	Contractor; verified by WSC
Vegetation buffer protection	No material or equipment storage within vegetated verges	Bi-weekly checks; incident log if deviations observed	Contractor Site Supervisor; WSC
Fauna disturbance	No intentional harm or handling of fauna observed on-site	Continuous visual checks; incident log if needed	Contractor
Post-construction revegetation	Natural regrowth or soil stabilization in backfilled areas	Visual assessment 2–4 months post-works	Contractor; reviewed by WSC
Buffer integrity maintenance	Vegetated edges remain intact; no erosion or slope failure observed	Monthly during construction and after heavy rainfall	Contractor; verified by WSC

Biodiversity Protection	All workers trained in flora and fauna protection protocols; attendance records maintained and up to date	Review of training logs and attendance sheets	Contractor; verified by WSC

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

Contractors must plan for the safe handling, segregation, containment, transportation 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) must:

- Clearly describe waste types expected at their site;
- Identify waste collection points, labelled 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 such as the use of PPE;
- 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 disciplinary actions, withheld payments, or suspension of works.

9.8.1.1 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; launch investigation on reason for non compliance 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, no temporary waste storage is allowed.	Reorganize storage area or replace containers as needed; 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
Disposal of hazardous waste	Store hazardous waste in secure containers; remove and dispose via licensed waste operators	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 hours; report to WSC	Daily to weekly	Contractor
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

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

9.8.1.2 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

9.9 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 Bimini Airport Road 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 graywater or blackwater discharge occurs at the construction corridor.

9.9.1.1 Management Measures

Action Area	Management Measure	Corrective Action if Deviations Occur	Timeline	Responsible Entity
Worker sanitation access	Workers will use existing restroom facilities at laydown yard.	Remind workers of designated sanitation site and proper health and safety procedures to avoid the spread of communicable diseases related to personal hygiene; 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 that are outfitted to prevent soil or water contamination.	Suspend activity; relocate equipment.	Ongoing	Contractor; monitored by WSC
Site inspections	Confirm no wastewater, graywater, 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. Ensure toilets are secured to prevent tipping.	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
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

9.9.1.2 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

9.10 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 along the Airport Road corridor. 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.

9.10.1.1 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

9.10.1.2 Monitoring, Indicators, and Responsibilities

Monitoring Parameter	Indicator	Method/Frequency	Responsible Entity
Chemical substance compliance	% of compliance in inspections conducted on	Bi-weekly inspections of storage areas and chemical use logs	WSC

	chemical substance management		
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 labelled, packaged, and transported in compliance with international best practices and national regulations.
- Maintain updated Safety Data Sheets (SDS) on-site and during transportation 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.

9.11 Occupational and Community Health and Safety

- The contractor shall regularly ensure compliance with relevant health and safety 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.
- Workers must demarcate work areas using appropriate signaling in order to promote awareness and help prevent accidents.
- The Contractor 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 and have keep readily available on site, the cards/flyers produced by WSC, which specifies 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 a number of 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 demand a diligent commitment to safety protocols, continuous training, and strict adherence to established guidelines to mitigate potential hazards and ensure the well-being of personnel involved.

9.11.1.1 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 weather protocols (WSC hurricane preparedness plan), list of medical personnel to be contacted, fire emergency personnel	Monthly checks, Log of emergency personnel to be shared	WSC Site Supervisors/Contractor

Accidents and incidents	Work accident and incident registration forms.	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 signaling 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 must also follow the plans established in the ESMP and WSC hurricane preparedness plan (Appendix B).

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, the 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 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.

9.11.1.2 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.

9.12 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.

9.12.1.1 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

9.13 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 preventative actions to reduce infestations, particularly those caused by poor waste management and stagnant water.

Summary: All contractors must implement proactive and reactive pest control measures before, during, and after site activities as well as conduct regular inspections for pest sightings. This includes clearing green waste, controlling stagnant water, storing food properly, pest proofing and coordinating pest control treatments with certified pest control providers. These measures are especially important near the Airport and warehouse and residential buildings. Public health and hygiene must be protected at all times.

9.13.1.1 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 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

9.13.1.2 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 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 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.

9.14.1.1 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, Code of Conduct, addressing gender-related issues (SEA/GBV), and emergency procedures.	Schedule make-up sessions	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, non-discrimination, safety, and behavior.	Retrain workers and enforce disciplinary actions if breached.	Pre-mobilization and onboarding	WSC Social Specialist
Records and Evaluation	Maintain detailed training logs, attendance sheets, and evaluation reports after each session.	Submit missing documentation; revalidate participation.	Ongoing	Contractor

9.14.1.2 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

9.15 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).

9.15.1.1 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 rest 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

9.15.1.2 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 resting areas with shade, hydration stations, and heat signage in open work areas	Weekly observation report	Contractor HSE; WSC
Access Route Availability	Unobstructed travel lane or bypass access maintained along Airport Road	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 develop and enforce 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.

9.16 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:

- 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

9.16.1.1 Management measures

WSC's Responsibilities:

Project Reporting: Receive 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)**

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.

9.16.1.2 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

9.17 COORDINATION WITH SERVICE PROVIDERS

9.17.1.1 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.

9.17.1.2 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

9.18 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, waste disposal and 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 along Airport Road in Bimini revealed areas with compacted sandy soils, water pooling, and scattered informal waste deposits. 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, 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.

9.18.1.1 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

9.18.1.2 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

9.19 CHANCE FIND PROCEDURE

9.19.1.1 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.

9.19.1.2 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

9.20 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.

9.20.1.1 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 in cleared or disturbed zones.	Require replanting and photo evidence of survival.	Within 2 weeks of site closure	Contractor; monitored by WSC 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

9.20.1.2 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

9.21 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 Airport Road 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

9.22 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	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,	Contractor (Environmental and Social Manager)

specific and relevant aspects applicable to the execution of projects in accordance with current 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		stress, mental load, psychophysical factors).	
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**:	Contractor Company

			• Forced posture; Repetitive motion; Cargo handling; Application of forces: Overexertion	
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 14 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 during the week of August 26, 2024. It will consist of a single consultation event, conducted in in-person format, in Nassau, New Providence. 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, 14 days in advance of the event date.

To ensure maximum stakeholder participation, the event will also be disclosed to the public starting 14 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 (SESA/SESMP) 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 SESA/SESMP 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 Plan EHS 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 ESGP.
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 different dissemination 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 – BIMINI AIRPORT ROAD