The Environmental and Social Impact Assessment and Environmental and Social Management Plan for the Upgrading of the Existing South Coast Sewage Treatment Plant (SCSTP), Construction of the New South Coast Water Reclamation and Re-use Facility (SCWRRF) and the Workers' Camp



Document Full Title	Environmental and Social Impact Assessment and Environmental and Social Management Plan for the Upgrading of the Existing South Coast Sewage Treatment Plant (SCSTP), Construction of the New South Coast Water Reclamation and Re-use Facility (SCWRRF) and Workers' Camp.
Document Short Title	SCSTP, SCWRRF and Workers' Camp ESIA/ESMP
Project	Barbados Climate Resilient South Coast Water Reclamation Project and Reuse Facilities
Project Number	BA-L1063
Contractor	China Railway Shanghai Engineering Group Co., Ltd. (CRSEG)
Executing Agency	Barbados Water Authority, Project Execution Unit
Financier	Inter-American Development Bank
Prepared By	SAEDI Consulting (Barbados) Inc.
Version / Revision	Rev. 4
Document Status	Final
Date	15 November 2026

Acronyms

Acronym	Definition
ABC	Adams–Barrow–Cummins Highway
AACRAO EDGE	American Association of Collegiate Registrars and Admissions Officers- Electronic Database for Global Education
AED	Semi-automatic external defibrillator
ANSI	American National Standards Institute
AoI	Area of Influence
BERT	Barbados Economic Recovery and Transformation
BLPC	The Barbados Light & Power Co. Ltd.
BOD	Biochemical Oxygen Demand
BOPD	Barrels of Oil Per Day
BSTP	Bridgetown Sewage Treatment Plant
BWA	Barbados Water Authority
CARICOMP	Caribbean Coastal Marine Productivity
CBD	Convention on Biological Diversity
CERMES	Centre for Resource Management and Environmental Studies
CFU	Colony Forming Units
CHA	Critical Habitat Assessment
CHAA	Critical Habitat Assessment Area
CITES	Convention on International Trade in Endangered Species
CoC	Code of Conduct
CRMP	Coastal Risk Assessment and Management Programme
CRSEG	China Railway Shanghai Engineering Group Co., Ltd.
CZMA & CZMP	Coastal Zone Management Act and Plan
CZMU	Coastal Zone Management Unit
dB(A)	A-weighted decibel

Acronym	Definition
DAI	Direct Area of Influence
DO	Dissolved Oxygen
EAAA	Ecologically Appropriate Area of Analysis
EI	Environmental Impact (impact pathway prefix)
EPD	Environmental Protection Department
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
ESMS	Environmental and Social Management System
ESPF	Environmental and Social Policy Framework
ESPS	Environmental and Social Performance Standard
FA	First Aid
FTC	Fair Trading Commission
FV	Field Verification (survey station prefix)
GBV	Gender-Based Violence
GDP	Gross Domestic Product
GHS	Graeme Hall Swamp
GoB	Government of Barbados
GPS	Global Positioning System
GRM	Grievance Redress Mechanism
GSA	Gender and Social Assessment
HIV	Human Immunodeficiency Virus
H_2S	Hydrogen Sulfide
HSE	Health, Safety and Environment
IDB	Inter-American Development Bank
ILO	International Labour Organization
IMF	International Monetary Fund
IPV	Intimate Partner Violence

Acronym	Definition
IUCN	International Union for Conservation of Nature
KBF	Key Biodiversity Feature
LBS	Land-based Sources of Marine Pollution
LMIS	Labour Market Information System
LMP	Labor Management Plan
LTI	Lost-Time Injury
LWDC	Lost Work Day Case
MEA	Millennium Ecosystem Assessment
MLST	Ministry of Labour, Social Security and Third Sector
MPCA	Marine Pollution Control Act
MTC	Medical Treatment Case
NBSAP	National Biodiversity Strategy and Action Plan
NEET	Not in employment, education or training
NENPASS	National Environmental Noise Perception and Social Survey
NIOSH	National Institute for Occupational Safety and Health
NM	Near Miss
NO_2	Nitrogen Dioxide
NPC	National Petroleum Corporation
NSFE	Non-standard forms of employment
NTU	Nephelometric Turbidity Units
OECD	Organization for Economic Co-operation and Development
OHS/OHSE	Occupational Health and Safety / Occupational Health, Safety, and Environment
OSHA	Occupational Safety and Health Administration
PAHO	Pan American Health Organization
PEU	Project Execution Unit
PIP	Performance Improvement Plan

Acronym	Definition
PM	Particulate Matter
PPE	Personal Protective Equipment
PV	Photovoltaic
PVC	Polyvinyl Chloride
PwD	Persons with Disabilities
RBA	Rapid Biodiversity Assessment
REL	Recommended Exposure Limit
RWDC	Restricted Work Day Case
SAEDI	SAEDI Consulting (Barbados) Inc.
SCSTP	South Coast Sewage Treatment Plant
SCWRRF	South Coast Water Reclamation and Re-use Facility
SEA	Sexual Exploitation and Abuse
SEP	Stakeholder Engagement Plan
SGBV	Sexual and Gender-Based Violence
SH	Sexual Harassment
SI	Social Impact (impact pathway prefix)
SME	Small and Medium Enterprise
SO_2	Sulfur Dioxide
SPAW	Protocol on Specially Protected Areas and Wildlife
STI	Sexually Transmitted Infection
TOR	Terms of Reference
TSS	Total Suspended Solids
TVET	Technical and Vocational Education and Training
TWA	Time-Weighted Average
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization

Acronym	Definition
UNFPA	United Nations Population Fund
USD	United States Dollar
UTM	Universal Transverse Mercator
WBG	World Bank Group
WGS 84	World Geodetic System 1984
WHO	World Health Organization
WMO	World Meteorological Organization

Key Terms

Area of Influence. The geographic area within which Project activities may cause a measurable change in an environmental or social receptor, comprising a direct area where physical pathways operate and an indirect area where secondary, hydrological and socio-economic pathways operate.[1]

Critical Habitat. Areas of high biodiversity value meeting the criteria set out in the Inter-American Development Bank biodiversity safeguard framework, comprising protected or internationally recognized areas, areas necessary to maintain them, habitat crucial for threatened, endemic or range-restricted species, habitat supporting migratory or congregatory species, and habitat of high biodiversity conservation significance.[2]

Critical Habitat Assessment Area. The area over which Critical Habitat is screened and Project impact pathways assessed, defined on an ecological basis. For this Project it comprises three nested units: the Core Critical Habitat Area, the Project and Habitat Interface Area, and the Functional Ecological Influence Area.[3]

Emergency bypass. The infrastructure installed at the existing plant permitting discharge of untreated or partially treated sewage in the event of a plant emergency. At this facility it comprises two eight-inch lines constructed in 2003 discharging into the Graeme Hall Bisecting Canal.[4]

Key Biodiversity Feature. A biodiversity element for which Critical Habitat is designated or which contributes to the ecological character of the designated area, and which is therefore a receptor for Project environmental management.[5]

Operational continuity. The maintenance of sewage treatment throughout the construction period, and the arrangements by which treatment is sustained while process units are taken out of service.[6]

Reclaimed water. Treated wastewater of a quality suitable for a defined beneficial use, in this Project including aquifer recharge and agricultural irrigation.[7]

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[1] Inter-American Development Bank, Environmental and Social Performance Standard 1, Assessment and Management of Environmental and Social Risks and Impacts, provisions on the area of influence of a project. (Inter-American Development Bank, n.d.)

[2] Inter-American Development Bank, Environmental and Social Performance Standard 6, Biodiversity Conservation and Sustainable Management of Living Natural Resources, Criteria A to F for the identification of Critical Habitat. (Inter-American Development Bank, n.d.)

[3] SAEDI Consulting (Barbados) Inc., Rapid Critical Habitat Assessment, 2026, definition of the Critical Habitat Assessment Area and its three nested units, read with Environmental and Social Performance Standard 6. (SAEDI Consulting (Barbados) Inc., 2026)

[4] Mahon, R., Oxenford, H., Parker, C., Valles, H. and Wiggins, B., Graeme Hall Swamp Barbados: studies, surveys, plans and development up to 2025, Section 4.2.1, description of the two eight-inch bypass lines installed in 2003. (Mahon et al., 2025)

[5] Inter-American Development Bank, Environmental and Social Performance Standard 6, provisions on the biodiversity values for which Critical Habitat is designated. (Inter-American Development Bank, n.d.)

[6] China Railway Shanghai Engineering Group Co., Ltd., Reply to Information Request, 12 September 2026, response on scheduling of construction within the shutdown and water-off windows confirmed by the operating entity. (China Railway Shanghai Engineering Group Co., Ltd., 2026)

[7] World Health Organization, Guidelines for the Safe Use of Wastewater, Excreta and Greywater in Agriculture and Aquaculture, Volume 2, read with the design water quality standard for reclaimed water set out in the facility description. (World Health Organization, 2006)

Residual significance. The significance of an impact after the specified mitigation measures have been applied and are operating as designed.[8]

Significant conversion or degradation. An effect of sufficient magnitude, extent, duration or irreversibility to materially reduce the integrity, ecological character or biodiversity support function of Critical Habitat, or to substantially compromise the Key Biodiversity Features and ecological processes for which it is important.[9]

Temporary works. Structures, plant and arrangements installed to permit construction while treatment continues, including bypass pipework, temporary pumping and temporary storage.[10]

Vulnerable groups. Persons or groups who may experience Project effects differently or more severely by reason of gender, age, disability, health status, income, employment status, nationality, language or migration status.[11]

[8] Fajardo, S., Environmental Report No. 004, Revision 02, South Coast Water Reclamation Project Environmental Management System, approved 22 July 2026, items 31 to 34 on impact rating methodology and the risk significance scale. (Fajardo, 2026)

[9] Inter-American Development Bank, Environmental and Social Performance Standard 6, definitions of significant conversion and significant degradation of natural and critical habitats. (Inter-American Development Bank, n.d.)

[10] World Bank Group, Environmental, Health and Safety Guidelines for Water and Sanitation, provisions on the control of releases during maintenance and construction at operating wastewater facilities. (World Bank Group, 2007)

[11] Inter-American Development Bank, Environmental and Social Performance Standard 9, Gender Equality, read with the vulnerable group definition applied in the Labour Management Plan, revised 26 August 2026. (Inter-American Development Bank, n.d.)

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1. Executive Summary

1.1. Purpose and Scope

This document is the integrated Environmental and Social Impact Assessment and Environmental and Social Management Plan for three components of the South Coast Water Reclamation Project: the upgrade of the existing South Coast Sewage Treatment Plant (SCSTP), the new South Coast Water Reclamation and Re-use Facility (SCWRRF), and the temporary Workers' Camp. All three are being constructed by China Railway Shanghai Engineering Group Co., Ltd. These facilities occupy adjacent footprints at Graeme Hall, Christ Church, immediately north of the Graeme Hall Swamp, a Ramsar Wetland of International Importance.

The three components are assessed within a single integrated framework because they cannot meaningfully be separated. The SCSTP upgrade, the SCWRRF new construction, and the temporary workers' camp share receptors, an access road, a workforce, a haulage network, and overlapping construction schedules. Their combined impacts are therefore evaluated comprehensively, ensuring that cumulative and correlated environmental and social pathways are fully captured within this ESIA/ESMP.

1.2. Approach

The assessment applies a single integrated method across the three project components and across environmental, social, and gender pathways. Each pathway is scored for likelihood and magnitude on five-point scales, with significance derived as the product of the two, using the risk matrix at Section 5.3 (Table 23). This is the matrix the Project Execution Unit reviewed for the Workers' Camp assessment, applied here to all three components. Every impact is assessed twice, before and after mitigation, and post-mitigation ratings assume that the stated measures are implemented in full and verified through the monitoring program.

Moreover, this document consolidates four bodies of work: the integrated assessment of the SCSTP upgrade, the SCWRRF new construction, and the temporary workers' camp; the Rapid Critical Habitat Assessment; the Gender and Social Assessment; and the April 2026 baseline studies and laboratory results. The basis of that consolidation, together with its two limitations, is recorded in Section 5.2.1.

1.3. Baseline Conditions

Three baseline findings govern the assessment. The first concerns the existing plant. Sampling on 16 April 2026 showed a plant that is not treating its inflow, as the table below records. For several parameters the effluent is worse than the influent. The plant is therefore a continuing pollutant source, and the upgrade is the mechanism by which that source is removed.

Existing plant performance, 16 April 2026 (Section 6.4.3)

Parameter	Entering the plant	Leaving the plant	Benchmark
Suspended solids	89 mg/L	142 mg/L	Effluent is worse than influent
Biochemical oxygen demand	215 mg/L	205 mg/L	Almost no removal

Parameter	Entering the plant	Leaving the plant	Benchmark
Ammonia		About 26 percent removed	Design expectation of 70 to 90 percent removal
Total phosphorus		4.7 mg/L	Environmental limit of 0.025 mg/L
Fecal coliforms and enterococci		Above safe limits by orders of magnitude	

The second concerns the receiving environment. Graeme Hall Swamp is the largest remaining inland mangrove and wetland system in Barbados. Blocking of the canal to the sea has reduced saltwater intrusion, the system has become predominantly freshwater, and the sluice gate was recorded as apparently inoperable during field verification in August 2026. CERMES Technical Report No. 110 characterizes the mangrove system as critically endangered, recording seventeen benthic taxa where a healthy comparable system supports approximately three hundred. The wetland already receives urban surface water from four drainage connections, carries storm damage from Hurricane Beryl and is subject to illegal dumping at its eastern margin. It has limited capacity to absorb further pressure.

The third concerns the community: Harmony Hall, adjacent to the SCSTP, and the surrounding Graeme Hall, St. Lawrence, Worthing and Rendezvous enumeration areas that form the 1 km socio-economic catchment. These enumeration areas hold 1,680 residents, of whom 25.8 percent are aged 65 and over against 13.57 percent nationally, and 41.1 percent are aged 55 and over. Owner occupation stands at 60.3 percent, 292 households are headed by older persons, and 373 residents are retired and present in the area during the working day. Two schools lie in the vicinity. That profile raises the sensitivity of the population to the odor, air quality, noise, traffic and vector pathways.[12] The full baseline is in Chapter 6.

1.4. Critical Habitat

Graeme Hall Swamp is confirmed as Critical Habitat and Critical Natural Habitat. Criteria A, B and F are confirmed triggers, and the determination is established independently through them; Criteria C, D and E are retained as potential triggers, with Criterion E held at high confidence. Six Key Biodiversity Features are identified, covering the Ramsar wetland and its ecological character, the hydrological and ecological processes supporting it, migratory and congregatory wetland birds, endemic and range-restricted resident birds, connected coastal and marine habitats, and threatened species.

Field verification established that neither facility occupies or permanently converts wetland habitat, and no encroachment was identified at the Project and wetland interface. Direct significant conversion is therefore not anticipated. The material risk is significant degradation through indirect pathways: construction runoff and sediment transport toward the Eastern Marsh, changes to drainage and water management, works affecting the existing conveyance within the Core Critical Habitat Area, and accidental or emergency release. The Project is not assessed as likely to result in significant conversion or degradation, provided the Critical Habitat safeguards are incorporated into design, construction and operation and their effectiveness verified through monitoring. The assessment is in Section 7.5, with the supporting matrices in Annexes D to F.

[12] Barbados Statistical Service, 2021 Population and Housing Census, enumeration area compilation for Graeme Hall, St. Lawrence, Worthing and Rendezvous, tables on population by age and sex, house tenure, economic activity and occupation. (Barbados Statistical Service, n.d.)

1.5. Principal Findings

Three pathway groups rate Critical before mitigation: discharge during bypass or construction, traffic and road safety, and sexual exploitation and abuse, sexual harassment and gender-based violence. Emergency bypass activation, accidental and emergency release, and reclaimed water quality carry a catastrophic consequence at a lower likelihood and rate Very High, or High to Very High. Discharge during bypass or construction and emergency bypass activation both act on confirmed Critical Habitat through a pathway with a documented history: the 2005 event released between three and six million gallons of preliminary treated sewage that reached the Sanctuary lake. Traffic and road safety on the shared narrow residential access route carries a credible fatality outcome, with schoolchildren and accompanying caregivers as the exposed groups. Accidental or emergency release of chemicals, fuel or process water is capable of causing significant degradation. Reclaimed water quality, aquifer recharge and agricultural reuse introduces pathways to the island's principal freshwater source and to the food chain, in a karst setting offering limited natural attenuation and with no groundwater baseline yet established. Sexual exploitation and abuse, sexual harassment and gender-based violence arises from a workforce that is 91.7 percent male housed adjacent to a residential community through a sustained peak period.

After mitigation, discharge during bypass or construction and gender-based violence retain a residual rating of High, while emergency bypass, traffic and road safety, reclaimed water and accidental release reduce to Medium. These pathways share a structure that determines how they must be managed: the controls reduce the likelihood of the event without removing its consequence, which remains high or catastrophic if the event occurs. For gender-based violence, prevention reduces the frequency of the conditions in which incidents arise but not the severity of an individual incident. Two further pathways stay High, or Medium to High, on certainty and not on severity: vegetation clearance within the approved footprint and operational energy demand. Management of the consequence-driven pathways concentrates on the integrity of preventive controls, the speed of detection and emergency preparedness, rather than on any assumption that consequences can be reduced after the fact. The six pathway groups in the table below have a catastrophic magnitude and are designated priority pathways (Section 5.3): their rating follows the matrix, but they are managed at the highest priority and a lower residual rating does not relax any control.

The table below sets the highest-rated pathways side by side, before and after mitigation. Every pathway rated Critical or Very High is listed in Table 103 (Section 7.4), and the individual assessments are in Sections 7.1 to 7.3 and 7.6.

Highest-rated pathways at a glance

Pathway	Component and reference	Before mitigation	Residual
Discharge during bypass or construction	SCSTP (STP-EI-01)	**Critical**	**High**
Emergency bypass activation	SCSTP (STP-EI-02)	**Very High**	**Medium**
Accidental and emergency release	SCSTP (STP-EI-15), SCWRRF (PRJ-EI-15)	**High to Very High**	**Medium**
Traffic and road safety	SCSTP (STP-EI-08), SCWRRF (PRJ-EI-07)	**Critical**	**Medium**
Reclaimed water quality, aquifer recharge and agricultural reuse	SCWRRF (PRJ-EI-09)	**Very High**	**Medium**

Pathway	Component and reference	Before mitigation	Residual
Sexual exploitation and abuse, sexual harassment and gender-based violence	Project-level (PRJ-SI-03)	Critical	High

The principal beneficial effect is the improvement in effluent quality following the upgrade, rated Very High and positive. It is measured against the quantified and currently failing baseline above, so it represents the removal of a continuing pollutant source rather than an incremental improvement. It is conditional on completion and commissioning of the works and on the reclamation facility being operational to receive the treated stream. Further benefits comprise reclaimed water production, reduced groundwater abstraction, improved national water security, employment and procurement, and skills transfer.

Employment is recorded as a benefit with a material qualification. Of 252 planned posts, 21 are held by women, a share of 8.3 percent, and 154 posts, being 61.1 percent of the workforce, sit in roles that employ no women at all. Local content declines from about 79 percent at mobilization to about 47 percent through peak construction, so the benefit is highest early and declines as disturbance peaks. Any statement that the Project creates employment opportunity for the community should be qualified accordingly.[13]

1.6. Management and Monitoring

The Environmental and Social Management Plan assigns each control measure to a responsible party with a frequency, a performance indicator and a corrective action trigger. A number of measures are pre-conditions rather than recurring controls, to be met before the activities they govern proceed. The most consequential are confirmation of the status of the emergency bypass lines, the sluice gate and the sewage spill protocol; adoption of a Sewage Spill Response Protocol recognizing Graeme Hall as Critical Habitat; adoption of an Operational Continuity and Bypass Management Plan; engineering confirmation of emergency containment, overflow and plant failure arrangements before operation; confirmation of the applicable reclaimed water standard and establishment of the groundwater baseline before recharge commences; an asbestos and hazardous material survey before demolition[14]; and Critical Habitat review before any works affecting the existing conveyance. These pre-conditions are the gate conditions listed in Section 7.12.

No biodiversity offsets or compensatory measures are required at this stage. The identified risks are addressed through avoidance, minimization, management, monitoring and adaptive management.

Compliance with the Plan is capable of audit. For every measured parameter the Plan states the indicator, the value or standard it is judged against, the method with its location and frequency, the party taking the measurement and a separate party verifying it, the level at which a corrective action follows, and the record that evidences the measurement. Thresholds are set at two levels, an alert level reached while performance is still acceptable and an action level at which the activity causing the result is stopped or changed. Reaching an action level is recorded as a non-conformance whether or not it is

[13] China Railway Shanghai Engineering Group Co., Ltd., Labour Management Plan, revised 26 August 2026, workforce composition table and phased deployment schedule recording 252 planned personnel, 61.1 percent local content and peak deployment of 203. (China Railway Shanghai Engineering Group Co., Ltd., 2026)

[14] Due to the age of the SCSTP, it is imperative that an asbestos and hazardous materials survey is done prior to any demolition activities commence to reduce the potential spread and exposure of hazardous materials to both workers and nearby communities.

corrected quickly, and a corrective action is closed by the verifying party and not by the party that caused the departure.

Reporting runs on a defined cycle. A monthly environmental and social performance report passes from the Contractor through the Contract Administrator to the Project Execution Unit, a quarterly compliance report goes to the Environmental Protection Department, the Barbados Water Authority and, on coastal matters, the Coastal Zone Management Unit, and a semi-annual compliance report goes to the Inter-American Development Bank. Monitoring performance is also disclosed to the affected communities quarterly in plain language, which closes the loop opened at consultation. Audit operates at four levels, from the Contractor's own quarterly internal audit outward to an annual independent audit by a party with no interest in the result. The management plans are in Section 8.4 and the monitoring, reporting and audit arrangements in Section 8.5.

1.7. Conclusion

The assessment concludes that the three project components can be constructed and operated at an acceptable level of environmental and social risk, and that the Project delivers substantial net environmental and public health benefit measured against current conditions. That conclusion is conditional in three respects. It depends on the pre-conditions above being met before the activities they govern proceed. It depends on the design information not yet fixed, principally the reclamation process design, the site drainage design and the reclaimed water quality standard, being settled consistently with the assumptions recorded in this assessment, and on the affected ratings being revisited when it is. And it depends on monitoring being used as it is intended, as the means by which the residual ratings in this document are verified rather than assumed.

The information gaps qualifying these findings are stated at Section 5.7, so that the weight carried by each conclusion is clear.

2. Introduction

This document follows the order in which an assessment is built: what the Project is, the rules that apply to it, how it was assessed, the conditions it starts from, the effects it may have, and how those effects are managed. Because the South Coast Sewage Treatment Plant (SCSTP) upgrade, the South Coast Water Reclamation and Re-use Facility (SCWRRF) and the temporary Workers' Camp share one site, one set of receptors and one baseline, the baseline and the methodology are stated once, and the three components are distinguished only where their pathways differ. The table below shows where each question is answered.

How this document is organized

Chapter	What it covers	Read it for
1. Executive Summary	Scope, baseline, Critical Habitat, principal findings, management and conclusion	The conclusions and the conditions attached to them
3. Program Overview	Project components and parties; profiles of the SCSTP (3.1), the SCWRRF (3.2) and the Workers' Camp (3.3); Area of Influence (3.4)	What is being built, where, by whom and on what program
4. Legislative and Institutional Framework	National legislation, IDB Environmental and Social Performance Standards, international frameworks	The standards the Project is measured against
5. Assessment Methodology	Evidence base (5.2), rating method and risk matrix (5.3), Critical Habitat test (5.4), information gaps (5.7)	How a rating was reached and how much weight it carries
6. Environmental and Social Baseline	Physical, biological and social conditions common to the three components	Conditions before the works begin
7. Environmental and Social Impact Assessment	Pathway assessments for the SCSTP (7.1), the SCWRRF (7.2) and the Workers' Camp (7.3); summary of impacts (7.4); Critical Habitat (7.5); Gender and Social Assessment (7.6); stakeholder engagement (7.7); cumulative impacts (7.8); summary of significance, consolidated matrix and residual risk (7.9 to 7.11); gate conditions (7.12)	What could happen, how significant it is, and what must be in place before work proceeds
8. Environmental and Social Management Plan	Required plans (8.1), priority measures (8.2), measures by pathway (8.3), management plans (8.4), monitoring, verification and audit (8.5)	Who does what, when, and how compliance is shown
Annexes A to K	Critical Habitat evidence and matrices (A to G), Commitments Register (H), Townhall Records (I), Contractor's HSE Management Manual (J), Comment-Response Matrix (K)	Supporting evidence and the record of review

3. Program Overview

The Barbados Climate Resilient South Coast Water Reclamation Project comprises four components, set out below with their treatment in this assessment.

Project components

Component	What it comprises	Covered by this assessment
1. Water reclamation infrastructure	Upgrade of the existing South Coast Sewage Treatment Plant, construction of the new South Coast Water Reclamation and Re-use Facility, and a workers' campsite serving both	Yes. The two facilities and the temporary camp are the subject of this document
2. Reclaimed water distribution	Pipeline of approximately 25 kilometers, with wells and pumping stations, delivering reclaimed water for irrigation of farmland and recharge of the groundwater resource	Only where it bears on the facilities, principally the reuse pathway (Section 3.2.5.2)
3. Climate change and biodiversity	7-megawatt solar photovoltaic plant with battery storage; restoration of the Graeme Hall Swamp Sanctuary	Only where it bears on the facilities
4. Institutional strengthening	Training, water resource management, daily operations, monitoring and verification systems, and gender equality and inclusion in the water sector, for the Barbados Water Authority	Only where it bears on the facilities

This assessment covers the two fixed facilities within Component 1, being the plant upgrade and the reclamation facility as well as the temporary workers' camp. The pipeline, wells and pumping stations under Component 2, the solar plant and the Sanctuary restoration under Component 3, and the institutional measures under Component 4 fall outside the design and build contract for the two facilities and the temporary workers' camp, and they are addressed here where they bear on the assessment of those facilities. The distinction carries weight at two levels. The destination of the reclaimed water, being the irrigation offtake and the recharge installation, sits within Component 2 and is therefore outside the confirmed scope of the works assessed in this document, which is the basis for the treatment of the reuse pathway in Section 3.2.5.2. The solar plant under Component 3 generates energy for consumption by the Project, which reduces the Project's demand on the national grid, and it is not configured to export power to that grid.

The Project is financed by the Inter-American Development Bank under loan number 5908/OC-BA, with Bank approval given on 26 July 2024. Upfront financing of approximately US$110 million is provided by the Bank together with the Green Climate Fund, including a Green Climate Fund grant of approximately US$40 million. The European Investment Bank supports the wider debt conversion through a guarantee of approximately US$150 million.

Accountability for delivery is distributed as shown below. The allocation of verification duties in the monitoring and reporting provisions of the Environmental and Social Management Plan (Section 8.5) follows this structure.

Parties and roles

Party	Role
Government of Barbados	Project owner and sovereign counterpart
Barbados Water Authority, through its Project Execution Unit	Leads implementation, procurement compliance, safeguards and stakeholder coordination; principal point of contact for project information and consultation

Party	Role
China Railway Shanghai Engineering Group Co., Ltd.	Design and build contractor for Component 1
SAEDI Consulting (Barbados) Inc.	Subconsultant to the Contractor for the environmental and social assessment and management requirements
AECOM	Contract Administrator for Component 1, providing contract administration and technical oversight; reviews the designs recorded in this assessment

The two facilities and temporary workers' camp occupy adjacent footprints on the same site, share the same receptors, and draw on a common environmental and social baseline. Their construction programs are expected to overlap. The SCSTP is a plant upgrade, with construction taking place around a facility that continues to operate, which drives odor, emergency discharge risk, and operational interface hazards. The SCWRRF is a new construction on undeveloped land, driving vegetation clearance, earthworks and the introduction of a reclaimed water pathway to groundwater and agriculture. The workers' camp provides accommodation and support facilities for the project workforce and management, introducing pathways related to occupational health and safety, gender balance, and community interaction that are assessed alongside the two facilities within the shared baseline. Interactions between the three are therefore assessed as correlated and cumulative impacts in Section 7.8.

The management plans, monitoring programs and safeguard measures in Chapter 8 therefore apply across all three components, with site-specific provisions noted where relevant. Sections 3.1 to 3.3 profile each component in turn.

3.1. Facility Profile: South Coast Sewage Treatment Plant (SCSTP)

The South Coast Sewage Treatment Plant (SCSTP) is an existing wastewater treatment facility commissioned in 2003 to serve Barbados' south coast sewerage network. The plant was originally designed to provide preliminary screening treatment, after which wastewater was pumped through the existing conveyance system to an ocean outfall. The facility also includes an emergency bypass system connected to the Graeme Hall Bisecting Canal and associated outflow infrastructure extending through the Graeme Hall wetland system.

Under the current project, the SCSTP will be upgraded to improve treatment performance and produce effluent of a standard suitable for transfer to the new South Coast Water Reclamation and Re-use Facility (SCWRRF). The upgrade may involve the replacement, modification, or retention of existing process units, together with changes to inlet and outlet arrangements, sludge handling, chemical storage and dosing, power supply and associated infrastructure. Because the SCSTP must continue receiving and treating sewage during construction, the works will also require careful sequencing, temporary works and operational-continuity measures to minimize disruption and reduce the risk of untreated or partially treated discharges.

Location and Receiving Environment

The South Coast Sewage Treatment Plant occupies a compound at Graeme Hall, Christ Church, on the same land parcel as the site of the reclamation facility and immediately north of Graeme Hall Swamp. It

is reached by the shared narrow residential access route that also serves the reclamation facility site and the workers' campsite, and it sits within the watershed draining southward toward the wetland and ultimately to the coast. The plant has two established physical connections to the wetland that the reclamation facility site does not have. Its emergency bypass is connected to the Graeme Hall Bisecting Canal, and its existing outflow conveyance runs through the wetland system to the ocean outfall. Those two connections are the reason the condition of this plant is assessed as a present pressure on confirmed Critical Habitat, in addition to the construction risk the works introduce.

Within the fence line the compound is developed ground in continuous operational use, and it carries no vegetation of assessment interest. Baseline measurement records the operating plant as the most significant existing noise source in the Project area, at a daytime average of 63.8 dB(A) at monitoring Location 2, downwind of the pump. The nearest residential receptors are the Harmony Hall cluster, where the measured daytime average of 56.3 to 60.5 dB(A) at Location 3 already stands at or above the International Finance Corporation daytime guideline of 55 dB(A) before any Project activity begins. Odor and hydrogen sulfide from the operating plant, and the quality of the effluent it currently discharges, are the features of the existing setting that bear most directly on the upgrade and on community experience of it.

Topography, climate, geology, soils, hydrogeology, hydrology and drainage, air quality, ambient noise, the biological environment and the social baseline are common to this plant, the reclamation facility and the temporary workers' camp. They are established once for both facilities and the temporary workers' camp in Chapter 6 (Environmental and Social Baseline) and are not repeated in either facility profile. The statements in this subsection are confined to the features specific to the plant compound and to its interface with the wetland.

3.1.1. Purpose of the Upgrade

The upgrade responds to the condition and capacity of the existing plant and to the treatment standard required to supply the reclamation facility. The works must be planned around operational continuity because the south coast collection system has no alternative destination and the population served by the plant cannot be taken off service.

3.1.2. The Existing Facility

The existing works are described here in the detail the assessment requires, because the condition of the plant is not background to the upgrade but the reason for it. Three things follow from that condition and are picked up throughout this chapter: the plant is currently a continuing pollutant source rather than a control on one, its emergency bypass discharges into confirmed Critical Habitat, and treatment must continue throughout the construction period.

The subsections below cover the plant's history and configuration, the emergency bypass and its discharge history, the existing outflow conveyance, the scope of the upgrade, the strategy for maintaining operation while the works proceed, the construction activities and program, and the alternatives considered.

Plant History and Configuration

The commissioning date and original design of the plant are given at the head of Section 3.1. Design capacity is confirmed in Section 3.1.4 and current effluent quality is reported in Section 6.4.3. The

current process configuration and actual throughput remain to be confirmed through the design and operational documentation.

3.1.2.1. Emergency Bypass

The plant was designed with an emergency bypass line directed into the Graeme Hall Bisecting Canal, comprising two eight-inch lines constructed in 2003 that release raw sewage into the canal in the event of an emergency at the plant.

The design of the emergency discharge structure depended on the sluice gate being fully operational to allow discharge of raw sewage out to sea. With the sluice gate closed, the pipes allow raw sewage to flow freely into the main lake of the Sanctuary.

It has been reported that the emergency discharge lines did not include automatic controls to open the downstream sluice gate when the emergency discharge is activated, and that the Environmental Protection Department advised there was no formal protocol for dealing with sewage spills, each occurrence being handled on an individual basis.

Field verification in August 2026 recorded the sluice gate as apparently inoperable.[15] Operation of the sluice gate remains the responsibility of the Drainage Unit of the Ministry of Transport and Works (MTW).

3.1.2.2. Discharge History

Periodic emergency discharge of high volumes of untreated sewage into the wetland has been associated with increased levels of nitrogen, ammonia, phosphorus, orthophosphate, bacteria, algae and total suspended solids in the wetland ecosystem.

A spill from the plant in 2005 discharged between three million and six million gallons of preliminary treated sewage, which traveled by overland flow across the government-owned spikerush marsh and into the lake, carrying organic waste, nutrients and pathogens together with chemicals, cleaners, oil and grease.

The Existing Outflow Conveyance

Field verification recorded the existing outflow conveyance continuing southward through the wetland toward the coastal outlet at Sandy Beach, with two pumping stations observed at station FV-06. That infrastructure lies within the Core Critical Habitat Area.

3.1.3. The Upgrade

The upgrade addresses the process units to be replaced, upgraded or retained, the treatment standard and capacity before and after the works, new structures, changes to the inlet, outlet and conveyance, the interface with the reclamation facility, sludge handling, chemical storage and dosing, and power supply and standby generation. The specific configuration is established in the design documentation.

Based on the proposed Project design, treated water is expected to be directed to the new reclamation facility for reuse, in place of the existing conveyance to the coastal outlet.

Operational Continuity and Bypass Strategy

[15] SAEDI Consulting (Barbados) Inc., Rapid Critical Habitat Assessment, Annex C, Ecological Field Verification Report, 2026, Section 3, station records FV-01 to FV-07, field visits of 21, 24 and 28 August 2026 by T. Phillips, G. Franklin and K. Blackman. (SAEDI Consulting (Barbados) Inc., 2026)

The operational continuity and bypass strategy is required before the SCSTP impact assessment can be completed. It should address:

- How treatment is maintained during each construction stage, and which process units are out of service at each stage.
- What temporary works are required, including bypass pipework, temporary pumping and temporary storage.
- What bypass arrangements are proposed, for what duration, and at what discharge quality.
- What happens in the event of failure during a bypass, including the containment available and the fallback position.
- What contingency applies during storm events and periods of elevated inflow.
- How the arrangements interact with the hurricane season and with the June to November tropical cyclone peak.
- What monitoring applies during each stage, and what triggers a halt to construction in favor of restoring treatment.

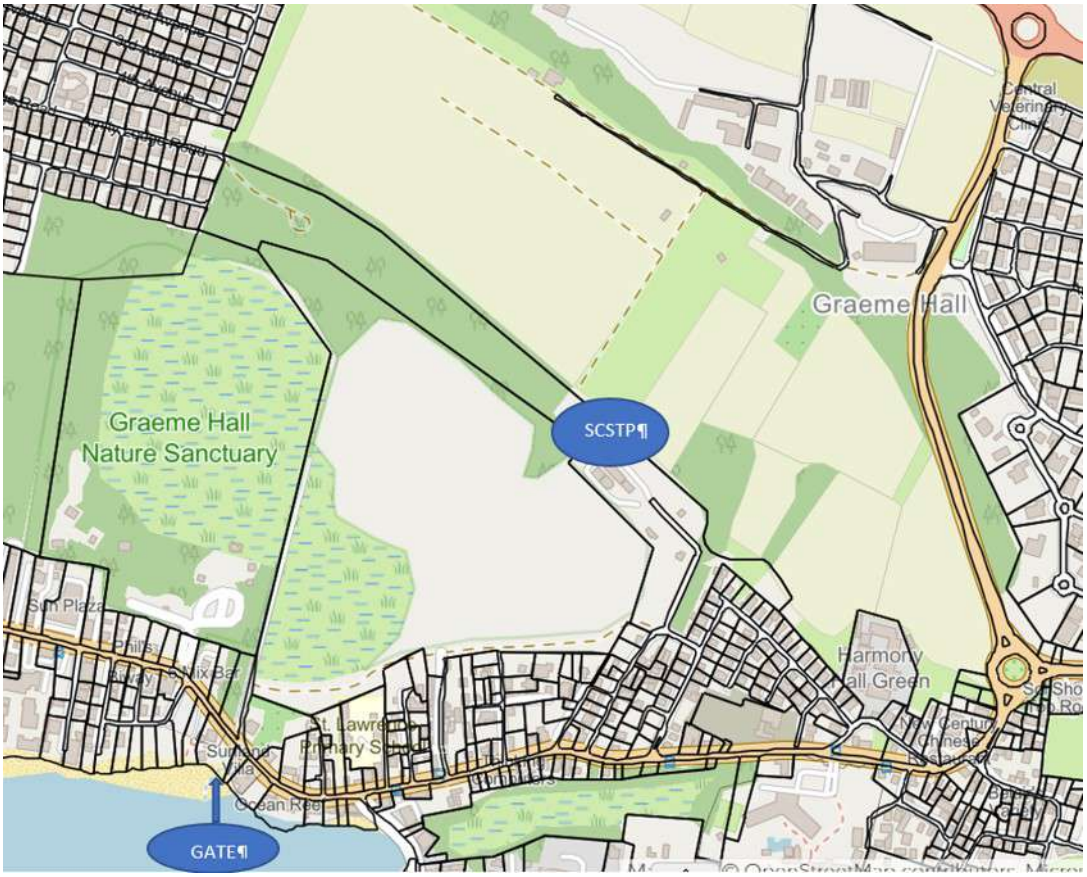
Construction Activities

Construction comprises site establishment, demolition and removal of redundant units, excavation adjacent to live process units, structural works, mechanical and electrical installation and tie-ins, commissioning and testing, and site reinstatement. Each activity requiring a process unit to be taken out of service is identified in the operational continuity strategy.

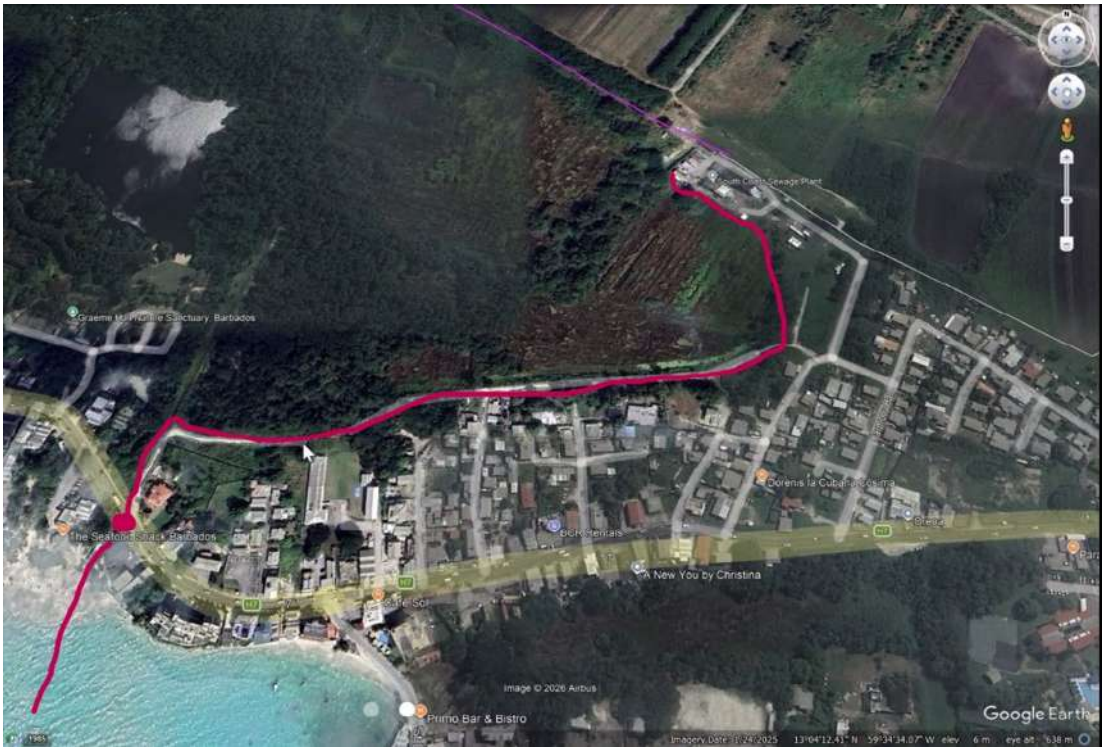
On 16 October 2026 the Barbados Water Authority confirmed the institutional arrangements that will apply to the existing wetland-to-coast outfall and conveyance system once the upgrade is complete, as set out in the table below. These responsibilities are carried into the assessment of the conveyance at STP-EI-11 and PRJ-EI-14 and into the Critical Habitat status table in Section 7.5. The system is shown on Map 1.

Institutional arrangements confirmed by the Barbados Water Authority, 16 October 2026

Element	Responsible body after the upgrade
New forcemain from the plant to the Needham's Point marine outfall	Barbados Water Authority (owner and operator)
Canal through which the existing conveyance runs	Ministry of Health, assisted by the Ministry of Transport and Works (maintenance)
Wetland	National Heritage Unit, Ministry of Environment (management)
Sluice gate	Drainage Unit, Ministry of Transport and Works (operation)



Map 1: SCSTP, Propose outfall from SCSTP to the coast, Gate point, Graeme Hall Swamp area, Graeme Hall Nature Sanctuary area



Map 2: SCSTP, Propose outfall from SCSTP to the coast, Gate point, Graeme Hall Swamp area, Graeme Hall Nature Sanctuary area (Satellite imagery)

Construction Program and Workforce

The construction program and its phasing are set against the operational continuity strategy, against the reclamation facility program with which it overlaps, and against the June to November hurricane season. Workforce numbers and composition are drawn from the Labor Management Plan.

The Workers' Camp component of this ESIA/ESMP, drawing on the Labor Management Plan, reports a total planned Project workforce of 252. It identifies a resident camp population of 120 at peak, comprising approximately 102 site workers and 18 management personnel, and notes that up to 203 persons may be present on the wider Project site during a working day. With 120 non-local residents and a total of 252, local content is 52.4 percent overall (132 posts), declining to 46.5 percent during the peak construction period from the third quarter of 2027 to the fourth quarter of 2028. These are Project-wide figures; the final allocation specifically to the SCSTP upgrade should be confirmed against the construction program and operational-continuity sequence.

The same source records 21 women among the 252 planned posts, a share of 8.3 percent: 20 employed through local subcontractors and one Chinese national in project management. Workforce deployment therefore has implications for gender-responsive facilities, worker-community interaction and the Project-wide SEA/SH/GBV controls, while employment terms, accommodation and occupational welfare remain governed by the Labor Management Plan, and Workers' Code of Conduct, Health and Safety instruments.

3.1.4. Confirmed Design Information for the SCSTP Upgrade

The confirmed design for the upgrade is set out below.

Function After Upgrade

Following the upgrade the SCSTP will function as the preliminary treatment unit for the SCWRRF. This is the single most consequential item in the confirmed design, because it changes the character of the facility. The plant ceases to be a works discharging treated effluent to the marine environment and becomes the front end of a treatment train whose discharge point is the reclamation facility.

Treatment capacity remains unchanged before and after the upgrade, with a maximum equipment treatment capacity of 23,760 cubic meters per day and a maximum hydraulic structural capacity of 27,930 cubic meters per day, and there is no defined treatment standard applicable before or after the upgrade.

Two consequences follow for this assessment. The beneficial effect previously recorded rests not on the SCSTP achieving a higher treatment standard in its own right, but on its output passing to the SCWRRF for full treatment and reclamation. The improvement in effluent quality reaching the environment is therefore delivered by the new facility, with the upgrade as the enabling step. Moreover, the absence of a defined treatment standard for this unit means compliance is measured at the SCWRRF outlet against the reclaimed water quality targets, and not at the SCSTP outlet.

Units Replaced, Upgraded and Retained

Table 1 presents the disposition of existing units.

Table 1: Disposition of existing units

Unit	Disposition
2 screw lift pumps	Retained
1 manual coarse bar screen	Retained
1 grit chamber	Retained
4 outfall pumps	Retained
10 mm medium screen	Retained as a standby unit
6 mm medium screen	New installation
2 rotary fine screens	Demolished
Screenings conveyor and compactor	Replaced
Oil removal units	2 additional units added
Odor control facility	1 new facility added
Sewage lift pump station	New construction, for pumping sewage to the new plant
Administration Building	Renovation comprising structural, finishing and lighting works

What this table shows. What happens to each piece of equipment at the existing plant. Five units stay, one is kept as a spare, two are demolished and the screenings conveyor and compactor are replaced. Three things are new, being a finer screen, two extra oil removal units and an odor control facility. The new sewage lift pump station is the piece that connects the old plant to the new one.

Demolition Scope

Demolition comprises two parts. In the existing headworks treatment area, the two rotary fine screens are demolished, and the screenings conveyor, compactor and associated process equipment and pipework are demolished and replaced. Old cabling and other electrical equipment and wiring are demolished and replaced, as are doors, door frames, windows, window frames and associated hardware.

In the existing Administration Building, the internal partition between the office and control room is demolished to expand the control room, the existing meeting room is converted into an office, the partition between the existing kitchen and washroom is demolished and the space converted into a lunchroom and kitchen, existing vinyl tile flooring is removed and replaced with ceramic tile, and the changing room and bathroom are renovated including replacement of plumbing fixtures.

Operational Continuity and Bypass

Construction will be scheduled in a reasonable sequence in line with actual site operating conditions, avoiding the plant peak influent periods as far as possible, and carried out during water-off or shutdown windows made available by the operating entity. Activities involving system switchovers, equipment shutdowns or a water-off condition will be coordinated and confirmed with the operating entity in advance and carried out within the confirmed windows.

The Administration Building renovation is sequenced behind the completion of the advanced water treatment building at the new facility. Renovation may commence only once operations and maintenance personnel have relocated and the existing building is unoccupied.

The new lift pump station and odor control equipment are located within the SCSTP where sufficient site space is available, which supports construction alongside operating units for those elements.

On bypass containment, the Contractor records that the specific disposal arrangement for bypass sewage requires further study and confirmation in conjunction with site conditions and SCSTP operational management, and states that the project site does not currently have the capability for temporary sewage storage or off-site removal by tanker truck. Further study is to be conducted on temporary treatment arrangements and other feasible bypass control measures, taking into account sewage flow during construction, the operating condition of existing facilities and the construction schedule.

This is the outstanding item of highest consequence in either assessment. The impact rating applied to discharge during bypass assumes that bypass is planned, sequenced and monitored, and that bypassed flow receives temporary treatment or is held in contingency storage. Neither storage nor tankering capability presently exists. Until the bypass containment study is complete, the mitigation on which the residual rating depends is not in place, and the gate condition requiring confirmed temporary treatment or storage arrangements before the first planned bypass remains unsatisfied.

Screenings and Grit

No sludge is generated at the SCSTP after upgrade, since the facility operates as preliminary treatment only. Screenings comprise larger floating debris captured by the screens, together with fibers, plastics, textiles and other non-biodegradable material, characterized by high moisture content and a low but non-negligible organic content, and prone to putrefaction and odor generation. After compaction, screenings are collected in bins and periodically transported off site for disposal.

Grit from the grit chamber comprises sand, gravel and other inorganic particulate matter entrained with a small amount of organic matter. After sand-water separation the grit is periodically transported off site for disposal.

Maximum screenings quantity is approximately 0.5 cubic meters per day before compaction, and maximum grit generation approximately 0.8 cubic meters per day. Both are empirical estimates, with actual quantities subject to site conditions. The putrefaction and odor characteristic of screenings is material to the odor management requirements, since storage duration before removal governs the odor generated.

SCSTP Construction Program

The SCSTP retrofit and interface works run from 10 November 2027 to 13 October 2028, a period of 267 days. That window falls entirely within the SCWRRF civil works period, so construction proceeds on both footprints simultaneously for approximately twelve months, spanning two wet seasons. Ancillary works for both plants run from 27 September 2027 to 13 February 2029.

3.1.5. Analysis of Alternatives: SCSTP Upgrade

The Barbados environmental impact assessment process and Performance Standard 1 both require an analysis of alternatives. For this facility, the analysis is governed by a constraint that does not apply to new construction. The plant must continue to receive and treat sewage throughout the works, because the south coast collection system has no alternative destination and the population it serves cannot be taken off service.

3.1.5.1. The No Project Alternative

Under the no project alternative the plant continues to operate at its existing treatment standard, providing preliminary screening with wastewater repumped to the ocean outfall.

Four consequences follow. The effluent quality reaching the receiving environment does not improve, and the plant continues to discharge at a standard set in 2003. The reclamation facility cannot be supplied, because reclaimed water for aquifer recharge and agricultural irrigation requires an influent quality the existing plant does not produce, so the wider Project water security objective fails with it. The emergency bypass to the Graeme Hall Bisecting Canal remains in its present condition, with the sluice gate recorded as apparently inoperable during field verification in August 2026, and the plant retains a failure route discharging toward confirmed Critical Habitat. Plant components commissioned in 2003 continue to age, and the probability of a failure event rises over time.

The no-project alternative is rejected on those grounds.

3.1.5.2. Alternative Treatment Standards

The treatment standard is set by two requirements acting together. The standard must satisfy the discharge consent conditions applying to the plant, and it must produce an influent quality sufficient for the reclamation facility to generate water suitable for aquifer recharge and agricultural irrigation.

The second requirement governs, because it is the higher of the two. A standard sufficient only for continued ocean discharge would leave the reclamation facility unable to operate and would strand the investment in it.

Alternatives above that threshold are compared on capital and operating cost, energy demand, footprint within a constrained site, chemical usage, sludge production, and the length of time each requires process units to be out of service during construction. The last of these carries weight beyond cost, because it determines bypass duration.

3.1.5.3. Alternative Construction Sequences

Sequencing is the alternative with the greatest environmental consequence on this facility, and it is assessed directly against bypass duration and frequency.

Bypass is the mechanism by which flow is diverted around a process unit taken out of service. Each bypass event carries a discharge of reduced quality for its duration. The rating applied at STP-EI-01 rests on bypass being planned, sequenced and monitored, and the total quantity of reduced quality discharge over the construction period is a direct function of how many units are taken out of service and for how long.

Three sequencing approaches are available in principle. Constructing new units alongside the operating plant and transferring flow once commissioned minimizes bypass, since the existing units continue treating until the replacement is proven. Refurbishing units in place requires each to be taken out of

service in turn, which maximizes bypass duration. A staged combination applies the first approach where site space allows and the second where it does not.

Site space is the constraint that decides between them. The plant occupies a defined footprint adjacent to the wetland, and the extent to which new units can be built alongside operating ones without encroaching toward the wetland margin determines how much of the work can avoid bypass.

Reducing bypass duration is a direct reduction in the Critical risk at STP-EI-01 and is available at the design stage at no environmental cost.

3.1.5.4. Alternative Bypass and Containment Arrangements

Where bypass is unavoidable, alternatives exist in what happens to the diverted flow.

Temporary treatment applied to bypassed flow reduces the quality shortfall for the duration. Temporary storage holds bypassed flow for treatment once the unit returns to service, and converts a continuous discharge into a deferred one, subject to the storage volume available. Tankering removes flow from the site entirely, at a cost in vehicle movements on the shared access road assessed at STP-EI-08. Discharge without treatment is the arrangement the assessment treats as the failure case.

The alternatives are not mutually exclusive, and the appropriate combination differs by construction stage and by the volume involved.

3.1.5.5. Alternatives for the Existing Wetland Conveyance

The existing outflow conveyance and its two pumping stations sit within Critical Habitat. Three options exist once treated water is directed to the reclamation facility.

Decommissioning in place leaves the infrastructure where it is, inactive. No works occur within the wetland, and no habitat disturbance arises, though redundant structures remain in place indefinitely.

Retention as redundancy keeps the conveyance available as a failure route. It preserves an operational discharge pathway into Critical Habitat, which is the arrangement the Critical Habitat Assessment identifies as the credible significant degradation scenario.

Removal restores the wetland to its condition before the conveyance was installed. It requires works within Critical Habitat, including access for plant and the disturbance associated with excavation and removal, and the Critical Habitat Assessment states that any Project change introducing direct wetland impacts requires the Critical Habitat implications to be reviewed before it is implemented.

The three options carry materially different assessments, and the option selected determines whether the SCSTP impact assessment addresses a construction impact within Critical Habitat or the removal of a long-term discharge pathway.

3.1.5.6. Alternative Screenings and Grit Management Routes

Screenings and grit arise through operation of the upgraded plant, at approximately 0.5 and 0.8 cubic meters per day respectively, together with construction waste during the works. No sludge is generated at the plant, which operates as preliminary treatment only, and sludge management routes are assessed at the reclamation facility. Routes available include (i) disposal at a government-approved site, (ii) segregation of the construction stream for recycling where the material allows. Comparison rests on available landfill capacity, vehicle movements on the shared access road, the putrescible character of screenings and the storage duration it permits, and cost.

3.1.5.7. Preferred Alternative

The preferred alternative is an upgrade of the existing plant to the treatment standard required to supply the reclamation facility, constructed through a sequence that builds new units alongside operating ones wherever site space allows, with temporary treatment or storage applied to any flow that must be bypassed.

The basis for that preference is as follows. The upgrade standard is set by the reclamation facility requirement, which is the higher of the two applicable thresholds, and a lower standard would strand the investment in the reclamation facility. Building alongside operating units minimizes the number of units taken out of service and therefore minimizes bypass duration, which is the single most effective reduction available against the Critical rating at STP-EI-01. Applying temporary treatment or storage to unavoidable bypass reduces the quality shortfall for its duration.

The preference is conditional on the operational continuity strategy confirming that site space permits the alongside approach for the majority of the works, and on the SCSTP priority containment arrangements being verified before construction adjacent to the operating plant begins.

The future configuration of the existing wetland conveyance is settled separately. Each of the three options carries a different assessment, and the option selected determines whether the SCSTP impact assessment addresses works within Critical Habitat or the removal of a long-term discharge pathway.

3.2. Facility Profile: South Coast Water Reclamation and Re-use Facility (SCWRRF)

The South Coast Water Reclamation and Re-use Facility receives treated effluent from the upgraded South Coast Sewage Treatment Plant and produces reclaimed water of a quality suitable for beneficial use. Under the wider Project the intended uses of that water are the irrigation of farmland and recharge of the groundwater resource. Both are delivered through Component 2 and fall outside the scope of the works assessed in this document, as set out in Section 3.2.5.2.

The facility changes the disposition of the treated stream. Based on the proposed Project design, treated water is expected to be directed to the facility for reuse, in place of conveyance through the existing infrastructure to the coastal outlet. The alternatives considered for this facility are analyzed in Section 3.3.5.

3.2.1. Location and Site

The site lies immediately north of the Graeme Hall wetland system, adjacent to the existing treatment plant, within the watershed draining southward toward the wetland and ultimately to the coast. Air quality monitoring Location 1 is recorded as within the boundary of the new facility, upwind of the existing facility and downwind of the workers' campsite, at GPS 21P 0221023, UTM 1446608.

Field verification conducted on 21, 24 and 28 August 2026, recorded the site as predominantly brushland and shrubbery with several mature trees, including mahogany and *lignum-vitae*, together with River Tamarind and Jamaica Caper along the margins. Overall, habitat and vegetation condition were assessed as good. A natural gully was observed along the eastern side of the Project area. Construction

access and works were evident at the time of the visits, with shade cloth in use as a dust control measure.

3.2.2. The Receiving Environment

Graeme Hall Swamp is confirmed as Critical Habitat and Critical Natural Habitat. Criterion A is confirmed by designation as a Wetland of International Importance under the Ramsar Convention, Site No. 1591. Criterion B is confirmed by the hydrological and ecological connections extending through the Project and wetland interface, the interconnected wetland drainage system and the downstream coastal connection. Criterion F is confirmed by[1] the wetland's standing as the largest remaining mangrove, marsh and open water system of its type in Barbados. Criteria C, D and E are retained as potential triggers, with Criterion E held at high confidence.

The nearest residential area lies approximately 250 meters to the southeast. Two schools are located in the vicinity. The enumeration area population of Graeme Hall, St. Lawrence, Worthing and Rendezvous is 1,680, of whom 25.8 percent are aged 65 and over, close to double the national proportion.

As with the plant compound, the topography, climate, geology, soils, hydrogeology, hydrology, air quality, ambient noise, biological and social baselines that apply to this site are established once for both facilities in Chapter 6 (Environmental and Social Baseline). The statements above are confined to the features specific to the reclamation facility site.

3.2.3. Facility Structure and Functional Areas

The facility comprises the treatment process and unit operations, storage, chemical dosing arrangements, sludge and residuals handling, buildings and tanks, site drainage including attenuation and discharge points, power supply and standby generation, site access, parking and laydown areas, and security and lighting installations. The design capacity reclaimed water quality targets, and process configuration are established in the design documentation.

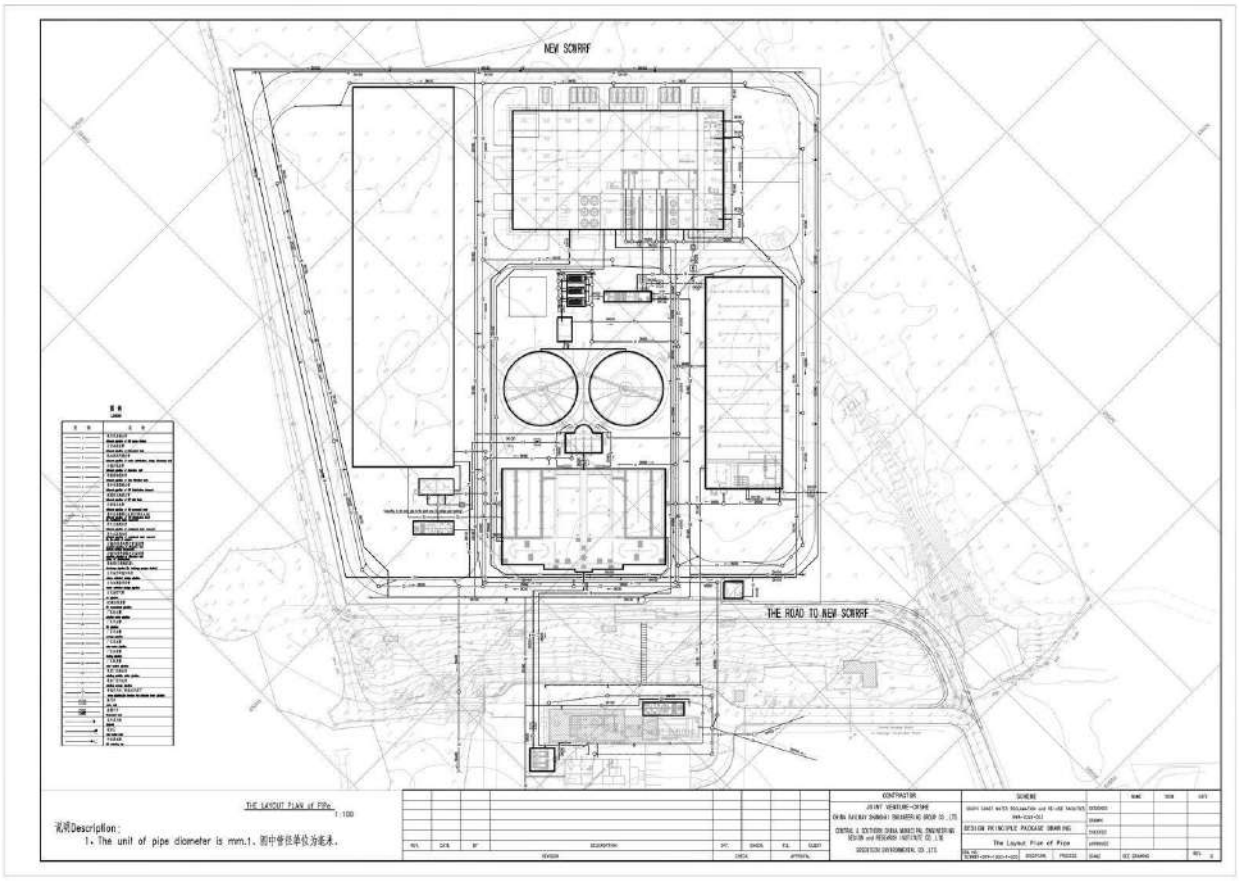


Figure 1: Design drawings for the South Coast Water Reclamation and Re-use Facility site

3.2.4. Confirmed Design Information for the SCWRRF

The confirmed design for this facility is set out below. The drainage routing was finalized by the Contractor on 9 October 2026, following the AECOM review, and the arrangements recorded below are the final ones.[16]

3.2.4.1. Treatment Process

The wastewater treatment train comprises coarse screening, fine screening, grit removal, oil removal, a lift pump station, five-stage Bardenpho biological treatment, mixed liquor splitter with return and waste activated sludge chamber, secondary clarification, a diversion chamber, disc filtration, ultraviolet disinfection, ultrafiltration, reverse osmosis, reclaimed water storage, and pumping to the reuse points.

The sludge train comprises a sludge storage tank, sludge dewatering, solar sludge drying to 75 percent solids content, and off-site disposal.

[16] China Railway Shanghai Engineering Group Co., Ltd., Reply to Information Request, 12 September 2026, responses to items 1 to 24 covering treatment process, design capacity, reclaimed water quality targets, chemical usage, sludge production, site drainage, earthworks, scope of reuse and construction program. (China Railway Shanghai Engineering Group Co., Ltd., 2026)

3.2.4.2. Design Capacity

Table 2: SCWRRF design capacity

Flow condition or unit	Capacity
Average dry weather flow	9,000 m^3/d
Peak dry weather flow	8,000 m^3/d
Peak wet weather flow	24,000 m^3/d
Preliminary and secondary treatment	Governed by peak wet weather flow
Tertiary treatment	18,000 m^3/d
Ultrafiltration and reverse osmosis	6,778 m^3/d

The table above shows how much the plant is built to handle. The gap between normal dry weather flow of 9,000 cubic meters a day and peak wet weather flow of 24,000 drives the sizing. The early stages are built for the peak, the middle stages for 18,000 and the final treatment stages for 6,778. The amount of reclaimed water the plant can produce is therefore set by the last stages and not by how much sewage arrives

3.2.4.3. Reclaimed Water Quality Targets

The reclaimed water quality targets establish the standards against which effluent from the integrated treatment train, comprising the upgraded SCSTP and the new SCWRRF, is measured before reuse for aquifer recharge and agricultural irrigation. These targets are critical because compliance is assessed at the SCWRRF outlet, not at the SCSTP, and they define the benchmark for public health protection, environmental safeguards, and regulatory compliance.

Table 3 sets out the parameters, applicable standards, and monitoring requirements. Each parameter is linked to its potential pathway of impact, with thresholds derived from national regulations, World Health Organization guidelines, and lender safeguard requirements. The targets serve as both performance indicators and compliance triggers, forming the basis for corrective actions under the Environmental and Social Management Plan.

Table 3: Design water quality standard for reclaimed water

Parameter	Design standard
Total suspended solids	Less than 5 mg/L
Biochemical oxygen demand, daily maximum	Less than 5 mg/L
Total nitrogen, daily maximum	Less than 5 mg/L
Total phosphorus	As needed, depending on site-specific factors
Total coliform, daily maximum	Less than 1 CFU per 100 mL
Fats, oil and grease, daily maximum	Less than 7 mg/L
Total dissolved solids, daily maximum	Less than 450 mg/L

Table 3 also shows the quality the reclaimed water has to reach. Comparing it with what the existing plant currently discharges gives the scale of the change: suspended solids fall from 142 milligrams per liter to below 5. The reverse osmosis stage achieves the dissolved solids and bacteria targets, and the earlier stages alone would not get there.

These targets are materially more stringent than the effluent quality currently leaving the existing plant, where suspended solids were recorded at 142 mg/L and biochemical oxygen demand at 205 mg/L. The reverse osmosis stage is the unit process that delivers the total dissolved solids and coliform targets.

3.2.4.4. Chemical Usage

Ten reagents are used across the treatment and sludge trains (see Table 4). Quantities are design dosing concentrations and are material to the hazardous material storage, bunding and spill response requirements in the Environmental and Social Management Plan.

Table 4: Design chemical usage

Reagent	Application and design dosing
Sodium hypochlorite, 5 percent available chlorine	Ultrafiltration chemically enhanced backwash at 73.1 kg/d; clean-in-place at 360 kg per dose, once every six months
Sodium hydroxide, 30 percent active	Ultrafiltration backwash at 12.2 kg/d; ultrafiltration clean-in-place at 30.0 kg per dose every six months; reverse osmosis clean-in-place at 67 kg per dose monthly
Citric acid monohydrate, 99 percent active	Ultrafiltration backwash at 16.2 kg/d; ultrafiltration clean-in-place at 198.9 kg per dose every six months; reverse osmosis clean-in-place at 445 kg per dose monthly
Antiscalant liquid	Reverse osmosis influent at 19.1 kg/d
Reducing agent, 98 percent active	Reverse osmosis influent at 32.5 kg/d; neutralization of excess hypochlorite at approximately 2.9 kg/d
Biocide liquid	Reverse osmosis at 3.8 kg/d, once every seven days for half an hour per dose
Sodium hypochlorite, 5 percent available chlorine	Reclaimed water reuse at 18 kg/d; dosing at the reclaimed water tank at 302 kg/d
Sodium acetate, 25 percent solution	External carbon source for the bioreactor at 4,715 kg/d under average dry weather flow and 1,715 kg/d under peak wet weather flow
Aluminum sulfate, 6.5 percent available aluminum	Emergency dosing for disc filter turbidity exceedance at 2,077 kg/d under average dry weather flow and 4,154 kg/d under peak wet weather flow, dosed only in emergency conditions
Polyacrylamide, solid	Sludge dewatering at 9 kg/d average and 13 kg/d maximum loading

Table 4 shows every chemical used at the new plant and how much of it. Sodium acetate dominates at up to 4,715 kilograms a day, so it drives the size of the chemical store. Aluminum sulfate is different: it is used only in emergencies, so a supply must be kept ready for a need that cannot be predicted. Sodium hypochlorite, sodium hydroxide and citric acid cannot be stored together and need separate bunded areas.

Three features bear on the assessment. Sodium acetate is dosed in the largest quantity of any reagent, at up to 4,715 kg/d, and is stored as a 25 percent solution. Aluminum sulfate is an emergency dosing reagent, which means its storage requirement is governed by a condition that arises unpredictably. Sodium hypochlorite, sodium hydroxide and citric acid are all present, and incompatible reagents require segregated storage under the waste and materials controls.

3.2.4.5. Sludge Production

Sludge is principally waste activated sludge, composed of biological flocs, microorganisms, biodegradable and inert organic matter, and a portion of inorganic suspended solids. It is characterized by high moisture content, relatively high volatile solids, fine particle size and relatively poor dewaterability. Dry solids quantity is 1.8 metric tons per day under average loading and 2.6 metric tons per day under maximum loading. Sludge is dewatered and then solar-dried on site to 75 percent solids content. The dried material is removed from site and disposed of or put to beneficial reuse in accordance with the applicable environmental requirements and the approved disposal arrangements for the Project, with the route selected recorded against each consignment under the waste manifest arrangements in the Solid Waste and Hazardous Materials Management Plan. The sludge drying facility is designed with provision to receive dewatered sludge from the Bridgetown Sewage Treatment Plant for drying, which would consolidate drying capacity for the two public plants at this site. That provision extends to sludge only. There is no arrangement for sewage to be brought to this site by road from any other plant or catchment, and the plant receives sewage only through the south coast collection system.

3.2.4.6. Site Drainage Design

The permanent stormwater system is an organized gravity-flow enclosed underground network. Stormwater is collected through inlets and underground pipes converging from north to south and from east to west, discharging through an outfall on the southeast side of the plant site. The site is divided into three catchment areas. Area A comprises the sludge treatment area with surrounding landscaping and roads, draining by gravity to node J12. Area B comprises the secondary and tertiary treatment areas, conveyed through nodes J10 and J11 to J12. Area C comprises the advanced water treatment building, the reclaimed water tank, and surrounding areas, conveyed through J10 to J12.

The design includes no stormwater detention or retention pond, no flood retention basin, no stormwater treatment facility and no stormwater lift pump station. Roof stormwater from certain buildings is collected separately, with a portion directed to collection tanks for irrigation of landscaped areas. For off-site stormwater, the boundary wall foundation on the west and south sides is raised above road level to act as a barrier, and interceptor drains on the north and east sides collect incoming water and discharge it to the existing gully.

The final receiving water body is the existing public wetland to the south of the existing treatment plant, which already receives stormwater runoff from that plant, and is separate from the private Graeme Hall Wetland. The Graeme Hall Wetland lies southwest of the existing plant site while the stormwater flow

direction is eastward through the public wetland, so that flow from the new plant site will not enter or intersect Graeme Hall.

That account describes the design as it stood at the Contractor's reply of 12 September 2026, which recorded the drainage design as then under review by AECOM and the Employer. The routing was finalized on 9 October 2026 following that review. The permanent stormwater system remains an organized gravity-flow enclosed underground network collecting through inlets and buried pipes, and the discharge point is on the southeast side of the plant area, discharging into the natural gully on the southeast side. Off-site stormwater is handled separately. On the west and south sides the concrete foundation at the base of the perimeter wall is raised above road level so that off-site flow drains along the road, and on the north and east sides intercepting ditches collect incoming off-site flow and discharge it to the existing gully.

Figure 2 shows the final stormwater drainage routing at the reclamation facility site.



Figure 2: Final stormwater drainage routing at the reclamation facility site, showing collection within the plant area and discharge through the southeast outfall to the natural gully

What this figure shows. The plan shows the site boundary with the internal drainage arrows converging from north to south and from east to west toward the southeast corner of the plant area, where the outfall

discharges into the natural gully marked at the southeast of the site. It is the design confirmation of the pathway the ecological field verification recorded, and it is the basis on which the runoff and sediment pathway is assessed as a confirmed feature of the scheme.

The adjusted outfall location reconciles the design account with the ecological field verification. Field verification recorded a natural gully along the eastern side of the Project area and identified a source and pathway relationship by which construction-related runoff and sediment could move downslope toward wetland receptors. The design now identifies that gully as the receiving feature for site stormwater, so the runoff and sediment pathway assessed in this document is a confirmed feature of the scheme. The controls at that pathway are retained in full, and the erosion, sediment and stormwater provisions of the Groundwater Protection and Monitoring Plan apply to the gully as a receiving feature. Two requirements follow. The hydrological study covering flow, level, direction and seasonal variation is required before the first discharge to the gully, so that the hydraulic capacity of the gully and its onward connection to the wetland drainage system are established on measured data. And the quality of the discharge at the outfall is brought within the monitoring program, with the gully and its downstream receptors treated as the receiving environment for that discharge.

The discharge to the gully is site stormwater. Sewage and treated effluent follow separate confined routes. Sewage arrives at the treatment plant through the south coast collection system and is conveyed from the plant to the reclamation facility by a dedicated pumped main, and the reclaimed water the facility produces is held in the reclaimed water tank and conveyed to the reuse points. Neither sewage nor treated effluent is discharged to the gully at any point in normal operation. The single route by which wastewater can reach the wetland drainage system is activation of the emergency bypass at the existing plant, which is assessed as a separate pathway and is governed by the gate conditions on bypass status and by the spill response provisions.

3.2.4.7. Earthworks, Clearance and Pipelines

Estimated soil and rock excavation is approximately 50,000 cubic meters, with approximately 20,000 cubic meters of backfill, giving a net export of approximately 30,000 cubic meters. Existing vegetation within the site boundary will be cleared. There are no pipeline works within or near the wetland margin.

3.2.5. Project Construction Program

The contract became effective on 14 May 2026 and construction completion is scheduled for 14 May 2029, a period of 36 months. A one-year operation and maintenance service runs from 15 May 2029 to 14 May 2030, followed by a two-year operation assistance period from 15 May 2030 to 14 May 2032.

Table 5 presents the program structure by work breakdown element.

Table 5: Program structure by work breakdown element

Element	Start	Finish	Duration
Mobilization, permitting and early works	14 May 2026	14 May 2029	871 days
Design and technical submittals	14 May 2026	6 May 2027	284 days
Procurement, manufacturing and	5 November 2026	16 April 2028	529 days

Element	Start	Finish	Duration
delivery			
New SCWRRF civil and building works	12 October 2026	2 November 2028	599 days
Existing SCSTP retrofit and interface works	10 November 2027	13 October 2028	267 days
Ancillary works for both plants	27 September 2027	13 February 2029	397 days
Start-up, commissioning and testing	16 May 2028	27 April 2029	277 days
Training, manuals and handover documents	16 May 2028	14 May 2029	289 days
Defects notification period and operation service	15 May 2029	14 May 2030	365 days
Operation assistance	15 May 2030	14 May 2032	731 days

The program carries one feature of direct environmental consequence. The SCWRRF civil works and the SCSTP retrofit overlap between November 2027 and November 2028, a period of approximately twelve months during which construction proceeds on both footprints simultaneously. That overlap is the condition assumed in the cumulative assessment, and it spans two wet seasons.

3.2.5.1. Reclaimed Water Distribution and Reuse

Reclaimed water distribution comprises conveyance from the treatment plant to the facility and conveyance from the facility to the reuse points. The onward distribution works, being the pipeline of approximately 25 kilometers, the recharge wells and the pumping stations, together with the agricultural offtake arrangements, are delivered under Component 2 and are outside the works assessed in this document. Quality monitoring points are established at the facility outlet and at each point of use that falls within the works. Contingency arrangements apply where reclaimed water does not meet specification. The recharge method, location and rate, and the identity of the agricultural users, are established under Component 2 and are not confirmed at the date of this assessment.

3.2.5.2. Scope of the Reuse Component

The facility produces reclaimed water to the design standard set out in the facility description. The confirmed scope covers production of that water, its storage and its conveyance to the reuse points identified in the design. It does not presently extend to injection into the aquifer or to supply arrangements with agricultural users.

The reclaimed water quality pathway is retained in the impact assessment for two reasons. The destination of the reclaimed water is not yet confirmed, so the receptors exposed to it cannot yet be identified and the pathway cannot be closed out. And the design standard for reclaimed water is set at a level appropriate to beneficial use, so the assessment of quality failure remains relevant to whatever destination is confirmed.

The pathway is therefore assessed by mechanism and not by location. Where the confirmed destination introduces a route to groundwater or to the food chain, the ratings and controls in that assessment apply in full. Where it does not, the residual exposure is limited to the reuse points within the Project boundary and the associated gate conditions on a groundwater baseline and an agreed irrigation specification fall away.

Beneficial effects are treated on the same basis. Water security through reduced potable demand and reduced irrigation cost to farmers are recorded as effects contingent on the reuse configuration that is ultimately confirmed and are not claimed as delivered outcomes of the project as presently scoped.

Confirmation of the reclaimed water destination is recorded among the outstanding design items in the Information Gaps and Assumptions chapter.

3.2.5.3. Construction Activities

Construction comprises site establishment, vegetation clearance, earthworks and excavation, foundation and structural works, mechanical and electrical installation, pipeline installation, testing and commissioning, and site reinstatement. The extent of vegetation clearance, the excavation and fill volumes, and the location of any pipeline works within or adjacent to the wetland margin are established in the construction methodology.

3.2.5.4. Construction Program and Workforce

The construction program and phasing plans are established at detailed design and are set against the plant upgrade program with which this facility overlaps and against the June to November hurricane season. Workforce numbers and composition are drawn from the Labor Management Plan, which records a total planned workforce of 252 with local content of 52.4 percent (132 local posts) and peak deployment of 203 in any quarter.

3.3. Facility Profile: Workers' Camp

3.3.1. Purpose of the workers' camp

The primary purpose of the Workers' Camp is to provide a centralized, safe, and efficient living and working environment for personnel assigned to the *Barbados Climate Resilient South Coast Water Reclamation and Reuse Facilities Project*. Housing staff and having offices near the project site will allow management to optimize project logistics, ensure worker welfare, maintain strict health and safety standards, and designate facilities to engage with various project stakeholders. The camp will be designed, constructed and managed by the Contractor in accordance with applicable national law and with the Inter-American Development Bank's Environmental and Social Policy Framework, including its commitments to non-discrimination, equality, the prevention of sexual harassment, sexual exploitation and abuse and gender-based violence, and respect for the rights and dignity of all workers and of the surrounding communities.

The layout of the camp, drawn to scale from the facility schedules in this chapter, is shown in Figure 3. Typical unit plans and the foundation build-up are in Figure 4. The schedules fix the number, size and occupancy of each unit; the arrangement of the units on the plot is indicative and is to be confirmed against the Contractor's construction drawings.

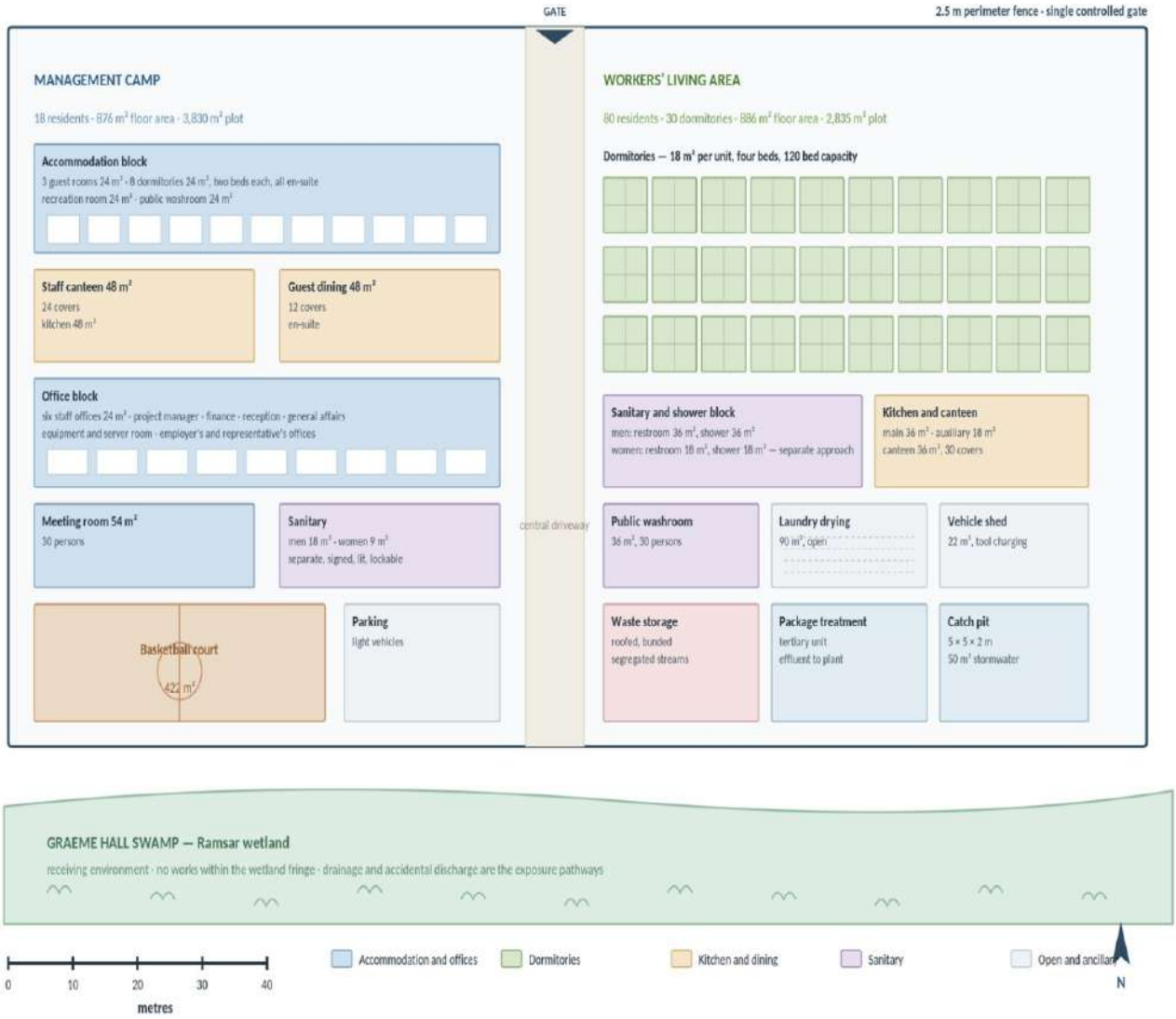


Figure 3: Indicative site layout. The management camp and the workers' living area sit either side of a single central driveway with one controlled gate, and the wetland lies immediately to the south.

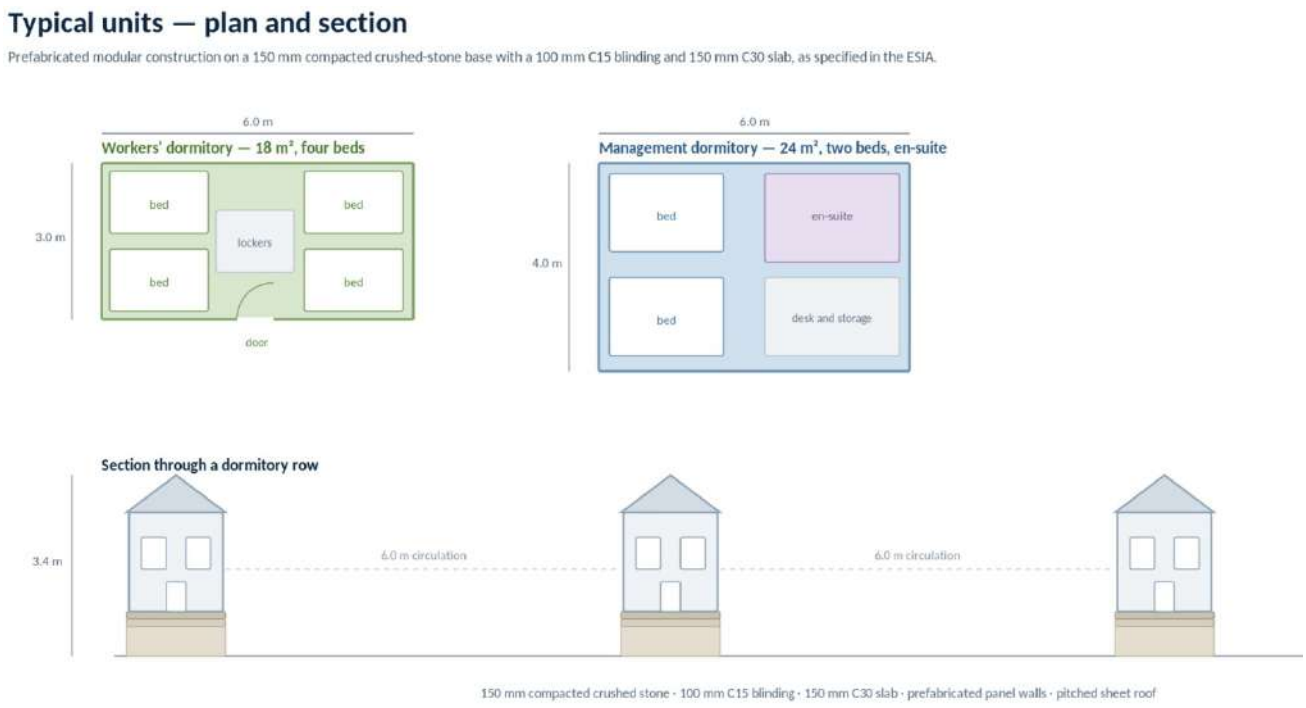


Figure 4: Typical dormitory unit plans and a section through a dormitory row, showing the 150 mm crushed stone, 100 mm C15 blinding and 150 mm C30 slab specified for the foundations.

The camp serves the following purposes:

- **Provision of Safe and Adequate Accommodation for Management and Staff of CRSEG:** The camp will offer secure living quarters and essential amenities for workers, including sleeping areas, sanitation facilities, potable water, dining areas, laundry services, electricity, internet connection, emergency response services and recreational spaces. This supports worker welfare, health, and morale throughout the project lifecycle.

Additionally, the accommodation and shared facilities will be designed and managed in a gender-responsive and inclusive manner, including separate, secure, and adequate sleeping and sanitation facilities for women and men, provision for proper hygiene management, and reasonable accessibility for workers with disabilities.

- **Facilitating Workforce Management and Logistics:** The camp will function as a centralized location for worker mobilization, shift coordination, transportation scheduling, training, toolbox meetings, emergency response, and supervision.

Further, the Contractor will manage and comply with national labor laws and standards, including fair contracts, wages, working hours, and rest periods for all workers. Also, a Code of Conduct, to be signed by all workers, subcontractors, and applicable stakeholders, will clearly prohibit discrimination, Sexual Harassment (SH), Sexual Exploitation and Abuse (SEA), and Gender-Based Violence (GBV) and will define expected behavior within the camp, with other employees and subcontractors and in interactions with the surrounding communities and other stakeholders. A Grievance Redress Mechanism (GRM) operates alongside the Code of Conduct (CoC) and provides safe, accessible and confidential channels through which any person, including women, men, persons with disabilities and members of other potentially vulnerable groups, may raise a concern or complaint, including concerns relating to sexual harassment, sexual exploitation and abuse or gender-based violence. Its purpose, access channels and

handling procedure are set out in the Grievance section of this document and in the companion Grievance Redress Mechanism recorded in Table 107.

- **Reducing Pressure on the Local Communities and Infrastructure:** The Workers' Camp is essential to the Contractor's operations and to ensure that its staff do not overburden nearby communities with sudden increases in demand for housing, water, sanitation, healthcare, and other services. The intention is to create a camp that is as self-sufficient as possible. Additionally, having the workforce in a centralized location will facilitate better management of interactions between the foreign workers and the local population. The population of the camp is expected to be Chinese nationals.

These interactions will be managed through applicable stakeholder engagement measures to help support the objectives of this project. Such engagement mechanisms will particularly assist where concerns may arise from nearby residents, institutions, and other stakeholders. More details on the Stakeholder Engagement activities and plans are outlined in *Section 7: Social Impact Assessment* of this document.

Additionally, the GRM will be active throughout all phases of this project. It will function to ensure that stakeholders (such as women, men, PWD, and other potentially vulnerable groups) have a safe, accessible, and confidential channel to raise concerns related to the Worker's presence and behavior in the area. More information on the GRM is outlined in *Section 7: Social Impact Assessment* of this document.

- **Provision of Temporary Facilities for Project Operations:** In addition to accommodation, the camp will also include offices, materials, and storage areas necessary to support project activities.

3.3.2. Location of the workers' camp

The Camp will be located at the northeastern corner of the new SCWRRF, approximately 30m from the nearest proposed structure. To the northeast, it is about 160m from the Ministry of Agriculture. To the southeast, it is roughly 250m from the nearest residential area. The distance to the existing SCSTP is approximately 220m. The coordinates of the four corners of the camp are as follows:

- Point 1: N=63382.227, E=28547.975 (13o04'27.25" N 59o34'17.29" W)
- Point 2: N=63295.356, E=28634.901 (13o04'24.57" N 59o34' 14.26"W)
- Point 3: N=63246.807, E=28612.199 (13o04'23.03" N 59o34' 15.03"W)
- Point 4: N=63345.655, E=28512.291 (13o04'26.01" N 59o34'18.42" W)

The area surrounding the workers' camp consists mainly of wasteland and farmland. All domestic sewage from the camp is conveyed to SCSTP for treatment and there is no on-site discharge. Construction-related impacts are limited to the immediate vicinity of the camp; no identifiable indirect environmental impacts extend beyond the camp site.

The site and its setting are shown in Figures 5 to 9: the camp boundary and its four corners, aerial views of the location and its immediate surroundings, the position of the site relative to nearby landmarks, and a ground-level view of the land as found.



Figure 5: Schematic of the Workers' Camp Location, highlighting the four corners



Figure 6: Proposed location of the Workers' Camp from an aerial vantage point



Figure 7: Schematic of the Workers' Camp in proximity to key nearby landmarks



Figure 8: Aerial view of the proposed location for the Workers' Camp, adjacent to the SCSTP



Figure 9: Ground-level view of the identified site for the Workers' Camp (and other project activities)

3.3.3. Camp structure and functional areas

The camp will be divided into two key accommodation zones or blocks, specifically:

3.3.3.1. Management staff camp

The management staff office and living camp will contain buildings constructed of prefabricated materials. These structures will be located on the northeastern side of the new plant. It will include the living quarters and office area for CRSEG's management staff, as well as office areas for the Employer and the Employer's Representative.

Notably, to ensure safe and comfortable living for all individuals who will occupy these living quarters, the CoC has been created to prohibit discrimination, bullying, and any form of SH/SEA/GBV at this facility. The CoC will be communicated and distributed to all workers, subcontractors, and relevant stakeholders in their respective language to ensure that all rules and expectations are clearly communicated. The CoC will also be strategically placed at visible locations throughout the Camp. The GRM operates alongside the CoC for this purpose. It may be accessed by workers and by community members through the channels set out in the Grievance section, including a confidential channel, and complaints concerning sexual harassment, sexual exploitation and abuse or gender-based violence are handled under a survivor-centered procedure rather than the general process.

The management camp will occupy a total site area of 3,830 m2, with a total building floor area of 876 m2. The female staff dormitory will also be located in this block. The female dormitory will be physically separated from the male dormitories, with controlled access, adequate external and internal lighting, and lockable doors for rooms and sanitary facilities to enhance privacy and safety. Further, the layout and circulation within this block will be designed to minimize isolated areas and reduce the risks of harassment or assault.

The accommodation area per person in the Management Staff Camp is 9m^2. The Management Staff Camp is designed to accommodate 25 people, including members of the AECOM team. The management staff dormitories will be structured to accommodate two people per room. Each room will be equipped with beds, closet space, and natural ventilation windows. An adequate number of washroom facilities will be available, inclusive of exhaust fans for air circulation. Separate washroom, shower and changing facilities are provided for women and for men in both the Management Staff Camp and the Workers' Camp. The women's facilities are located within the female dormitory block, are lockable from the inside, and are reached by lit internal routes that do not pass through male accommodation areas. The number, location and ratio of facilities to users in each camp are given in the accommodation schedule.

LED lighting will be installed in all areas, such as various indoor spaces, common areas, pathways to bedrooms, restrooms, dining rooms, and night lighting will be provided in public areas. Additionally, night-time lighting will be provided in all covered walkway areas beneath the canopies. Also, night-time lighting will remain on around the bedrooms of the female dorm, all female living and recreational facilities and women's restrooms.

The detailed arrangements for the Management Staff Camp are outlined in Table 6 below, along with other supporting figures.

Please note, however, that the architectural images shared herein are originally highly detailed AUTOCAD images that have been considerably compressed to their present form. Therefore, some distortion will be visible. However, the original image below (and all others in the document) are available upon request. This will enable the reviewer to have clearer images for reference wherever necessary.

Table 6: Management Staff Camp Facilities

					Management Staff Camp Facilities		
No.	**Item**	**Building Area (m^2/ unit)**	**Unit**	**Qty**	**Per Room: Beds/Occupant/ Max Occupancy**	**Max Occupancy**	**Remarks**
1	Guest Accommodation Room	24	Unit	3	1/1/1		with an en-suite bathroom
2	Dormitory Rooms	24	Unit	8	2/2/2		with an en-suite bathroom
3	Recreation Room	24	Unit	1		4	
4	Public Washroom	24	Unit	1		6	
5	Employer's Representative Kitchen and Dining Room	24	Unit	1		8	
6	Staff Canteen	48	Unit	1		24	
7	Kitchen	48	Unit	1			

					Management Staff Camp Facilities		
8	Guest Dining Room	48	Unit	1		12	with an en-suite bathroom
9	Employer's Representative Office	18	Unit	1			
10	Employer's Office	18	Unit	1			
11	General Affairs Office	18	Unit	1			
12	Equipment Storage and Server Room	18	Unit	1			
13	Employer's Representative Bathroom	18	Unit	1			
14	Employer's Representative Lounge	18	Unit	1	2/2/2		
15	Meeting Room	54	Unit	1		30	
16	Men's Restroom	18	Unit	1		5	
17	Women's Restroom	9	Unit	1		3	
18	Storage Room	9	Unit	1			
19	Staff Offices	24	Unit	6			Three of the rooms will have washroom facilities
20	Finance Office	18	Unit	1			
21	Project Manager's Office	18	Unit	1			
22	Reception Room	18	Unit	1		8	
23	Basketball Court	422	Unit	1			
24	Crushed Stone Leveling	/	Unit	3 0 5			
25	Site Leveling	/	Unit	3 8 3 0			

The architectural drawings for the Management Staff Camp are reproduced at Figures 10 and 11.

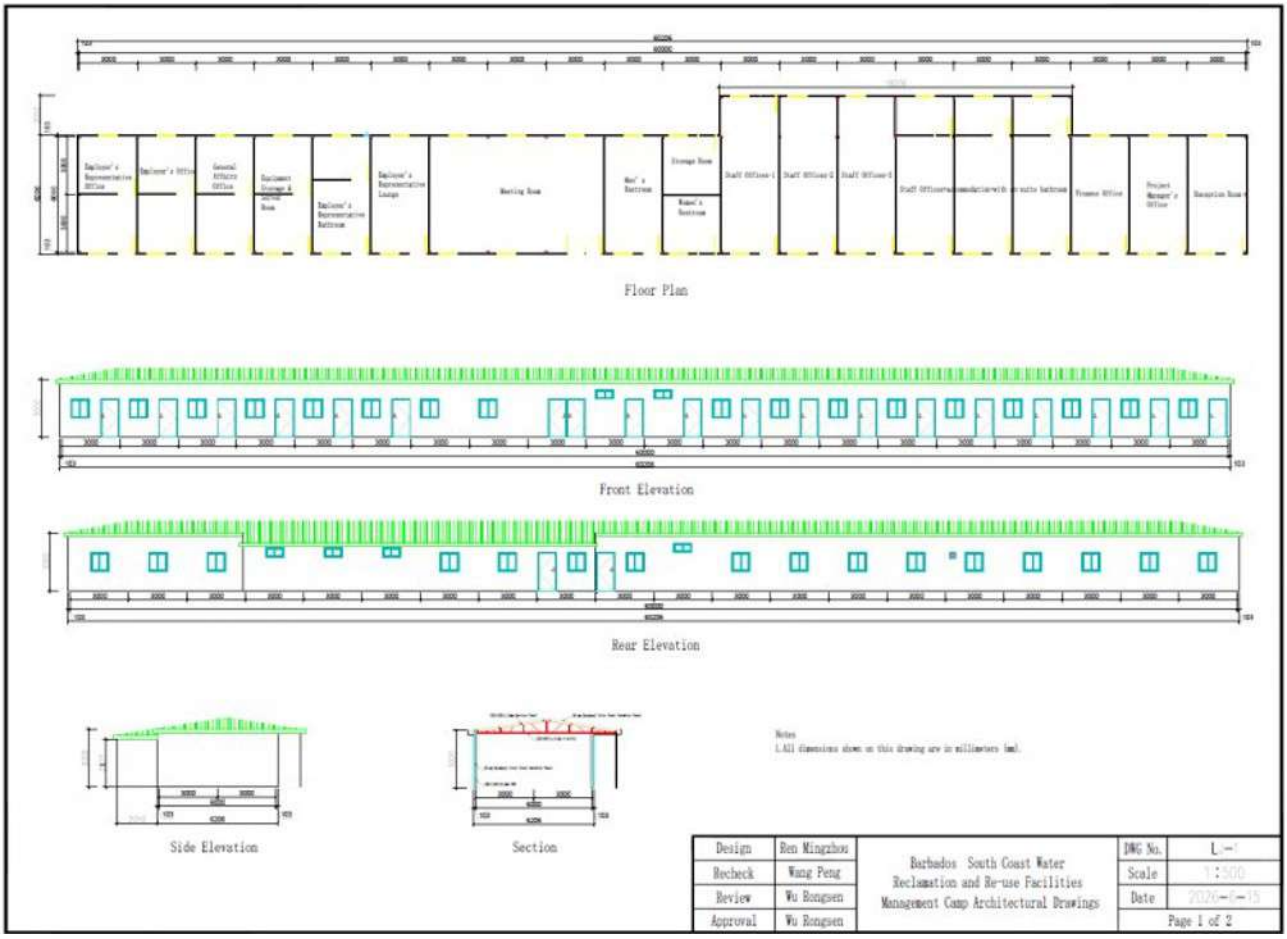


Figure 10: Management Camp Architectural Drawings (Part 1 of 2)

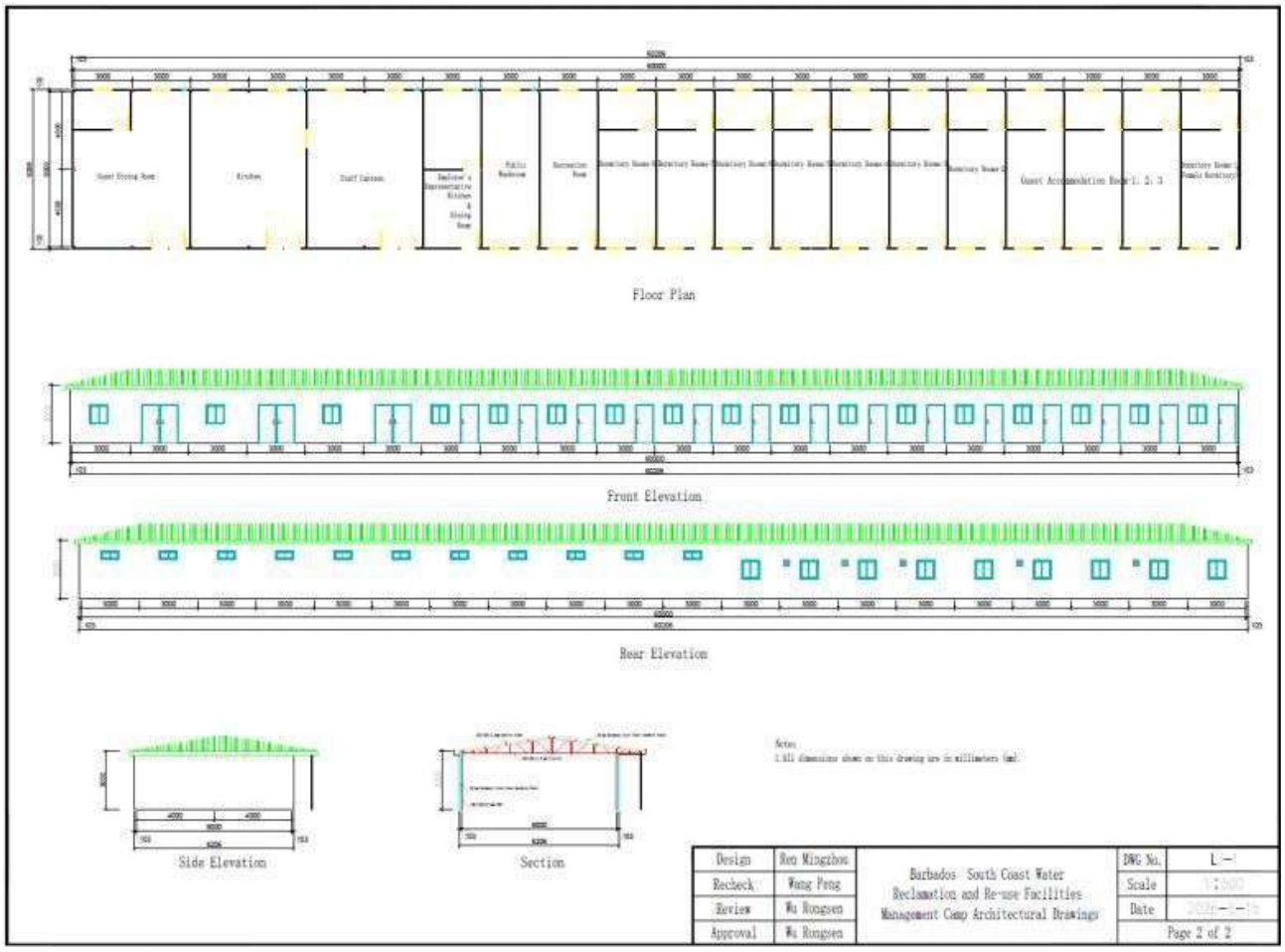


Figure 11: Management Camp Architectural Drawings (Part 2 of 2)

3.3.3.2. Workers' living area

These structures will be constructed to house the labor team. Similar to the Management Staff Camp, the structures will be prefabricated and consist of dormitories, washing areas, and a canteen, among other functional areas. The Workers' Camp living area will occupy a total site area of 2,835 m2, with a building area of 788 m2.

The figure of 120 is the design capacity of the workers' living area, providing headroom above the anticipated peak construction workforce of approximately 80. These figures reconcile with the Project Workforce Deployment Plan in the Contractor's Labor Management Plan, which shows a scheduled peak of 98 personnel sustained from the third quarter of 2027 to the third quarter of 2028, comprising 18 management personnel and 80 site workers; as agreed with the Project Execution Unit, the camp is assessed throughout this document at its design capacity of 120 resident personnel, comprising 102 site workers and 18 management personnel. The 18 management personnel are accommodated in the Management Staff Camp, which provides 25 places, the balance being available to the Employer's Representative and the AECOM team. The resident population assessed across both camps is therefore 120, the combined design capacity.

The allocation of the dormitories will ensure that women and men are accommodated in separate areas with controlled and monitored access. The women's dormitories, restrooms, and shower rooms will be

located separately to allow safe, well-lit access routes at all times, and all shared sanitary facilities will have functional locks and adequate privacy measures (e.g., doors, partitions, curtains). The women's restrooms and shower rooms will be equipped with facilities for menstrual hygiene management, including covered disposal bins, regular waste collection, access to water, and privacy for washing and changing. The accommodation schedule identifies the rooms designated as women's dormitories as a separate line item. Compliance is verified at the pre-occupancy inspection and thereafter through the monthly camp inspection, which records the availability and condition of separate accommodation and sanitary facilities against the agreed minimum standards and reports to the Project Execution Unit.

Additionally, the available laundry spaces will be organized to ensure that women and men can use them safely and with adequate privacy, including appropriate lighting. Where feasible, designated times will be outlined for laundry activities to reduce overcrowding and potential for harassment. Overall, various rooms will have maximum occupancy provisions, and those numbers will not be exceeded. Also, the sanitary facilities in the camp will be designed to be accessible to workers and visitors with reduced mobility, including ramps, grab bars, and adequate circulation space in line with universal access principles.

The detailed arrangements for the workers' living area are outlined in Table 7 below:

Table 7: Workers' Living Area Facilities

Workers' Living Area Facilities					
No.	**Item**	**Building Area (m2/unit)**	**Qty**	**Max Occupancy**	**Additional Notes**
1	Dormitories	18	30	4 per room	120 max capacity
2	Main Kitchen	36	1	2 cooks	
3	Auxiliary Kitchen	18	1		
4	Workers' Canteen	36	1	30	
5	Women's Restroom	18	1	5	
6	Women's Shower Room	18	1	5	
7	Men's Restroom	36	1	10	
8	Men's Shower Room	36	1	13	
9	Public Washroom	36	1	30	
10	Non-motor Vehicle Shed and Construction Tools Charging Area	22	1		
11	Laundry Drying Area	90	1		
12	Site Leveling	Square meters	2835		

Notably, the majority of the project workforce will be Chinese workers, whose daily dining habits typically involve returning to their dormitories for simple meals. Consequently, the frequency of centralized dining

is relatively low. The current dining hall seating arrangement and kitchen area have been reasonably designed based on the expected dining patterns and workforce habits. During future peak workforce periods, the camp facilities will be dynamically adjusted and optimized in accordance with actual demand to ensure that dining facilities remain sufficient and fit for purpose. Occupancy is managed so that overcrowding does not arise at peak workforce. The workers' living area provides 30 rooms for four persons per room, giving a design capacity of 120, which is the resident figure used throughout this assessment, so that no room is occupied beyond its design occupancy. Room allocation avoids mixing shift patterns within a room where practicable, personal storage is lockable, and the camp rules restrict access to sleeping areas to their occupants. These measures are applied specifically to reduce the risk of harassment associated with crowded shared accommodation, and adherence is checked at the monthly camp inspection.

Rainwater from the workers' and management camp will be collected, converged, and stored in catchment wells to be used by the occupants of the camp. Additionally, three-stage sedimentation tanks shall be installed separately in the camp to process the generated domestic sewage. This sewage will be discharged to the nearest sewage manhole, adjacent to the SCSTP. The finished ground elevation of the outdoor areas for both camps is provisionally set at 7.3m (msl), while the indoor floor elevation will be provisionally 7.5m (msl), 20cm higher than the outdoor ground level. The workers' living area is expected to accommodate up to 102 workers at peak construction; with the 18 management personnel housed in the Management Staff Camp, the camp's resident population at peak is 120. The workers' and management staff camp will be surfaced with gravel. The architectural drawings for the Workers' Living Area are reproduced at Figures 12 to 15.

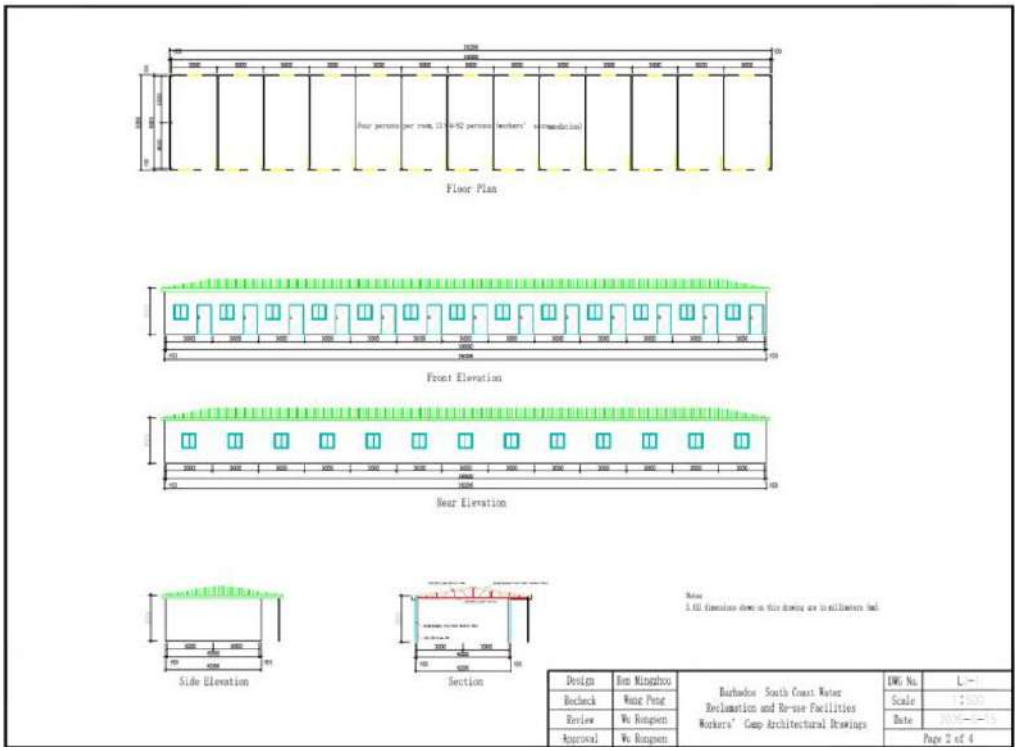


Figure *12*: Architectural Drawings of the Workers' Living Area (Part 1 of 4)

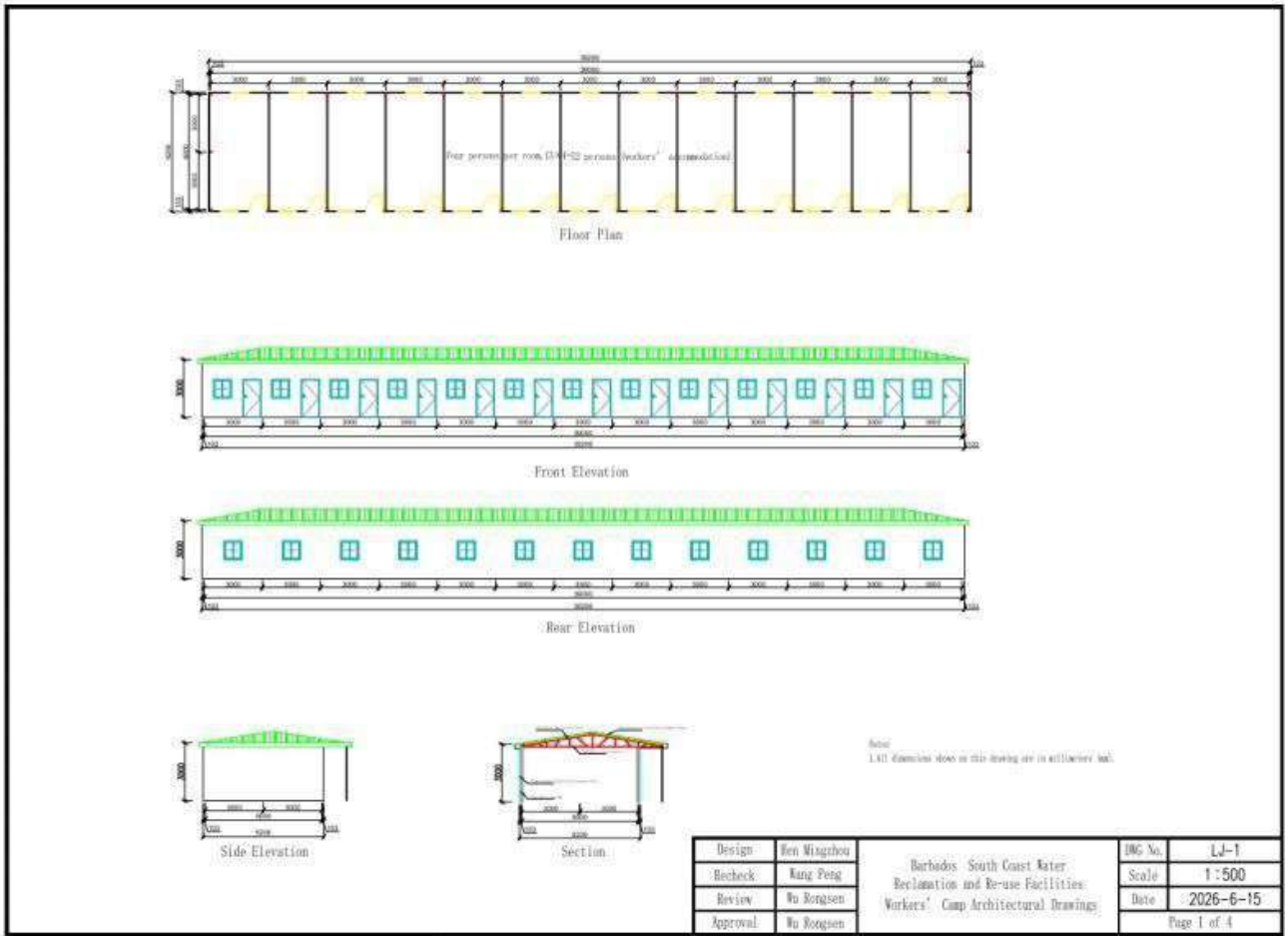


Figure 13: Architectural Drawings of the Workers' Living Area (Part 2 of 4)

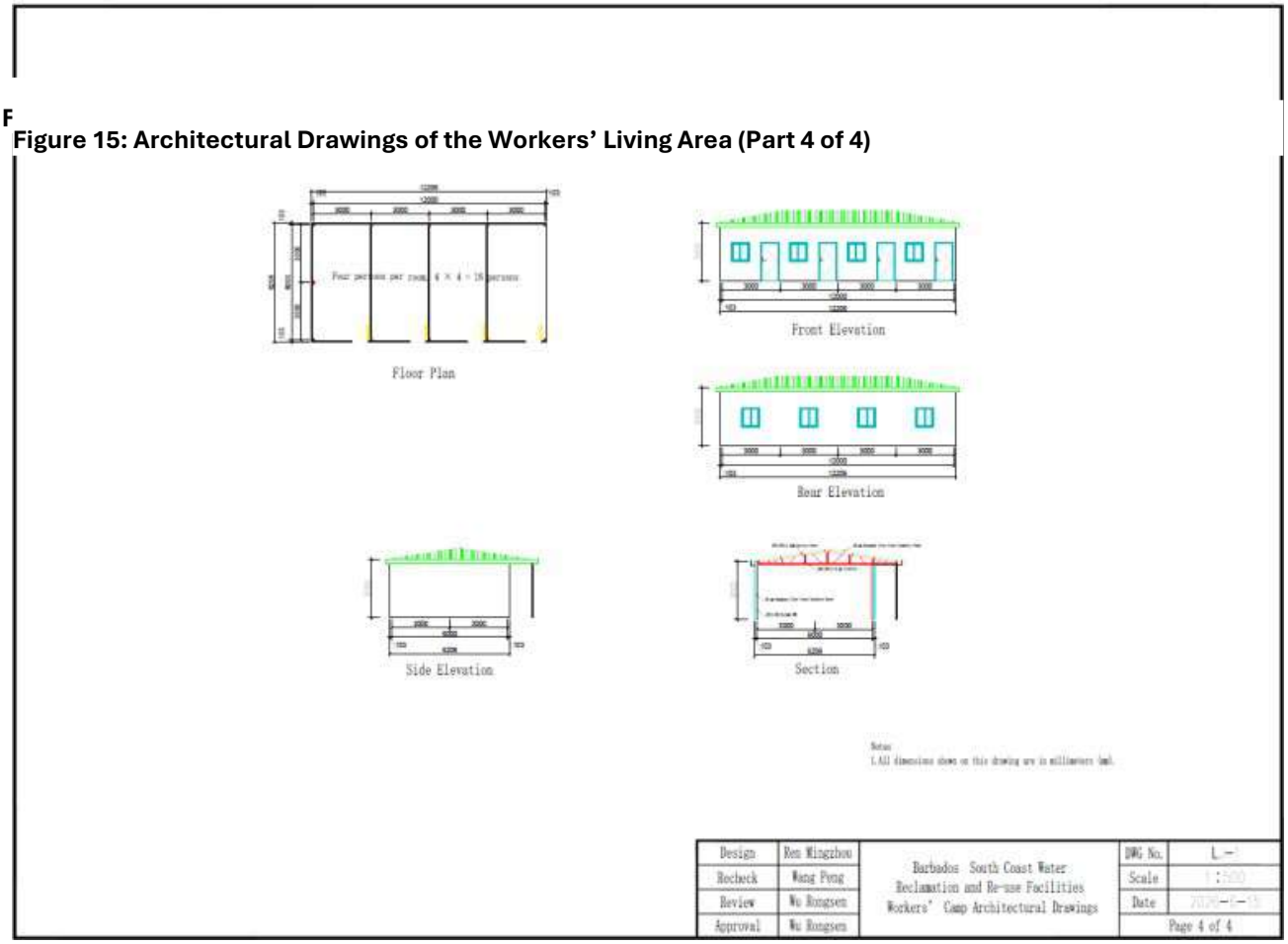
3.3.3.3. Gates and Fencing

The facility will be secured and bordered by steel fencing, 2.5 to 3 meters high. Only authorized personnel will be allowed to access the grounds of these facilities. Local security will be arranged as necessary, in addition to developing a relationship with local law enforcement and police present within the community.

All project personnel activities will be strictly confined within the camp and/or the project construction area. This is to ensure there will be no social disturbance or negative impact on the surrounding communities. Further, the fencing will not obstruct the movement of local wildlife, nor will it affect residents' access to and from their homes and property.

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Figure 15: Architectural Drawings of the Workers' Living Area (Part 4 of 4)



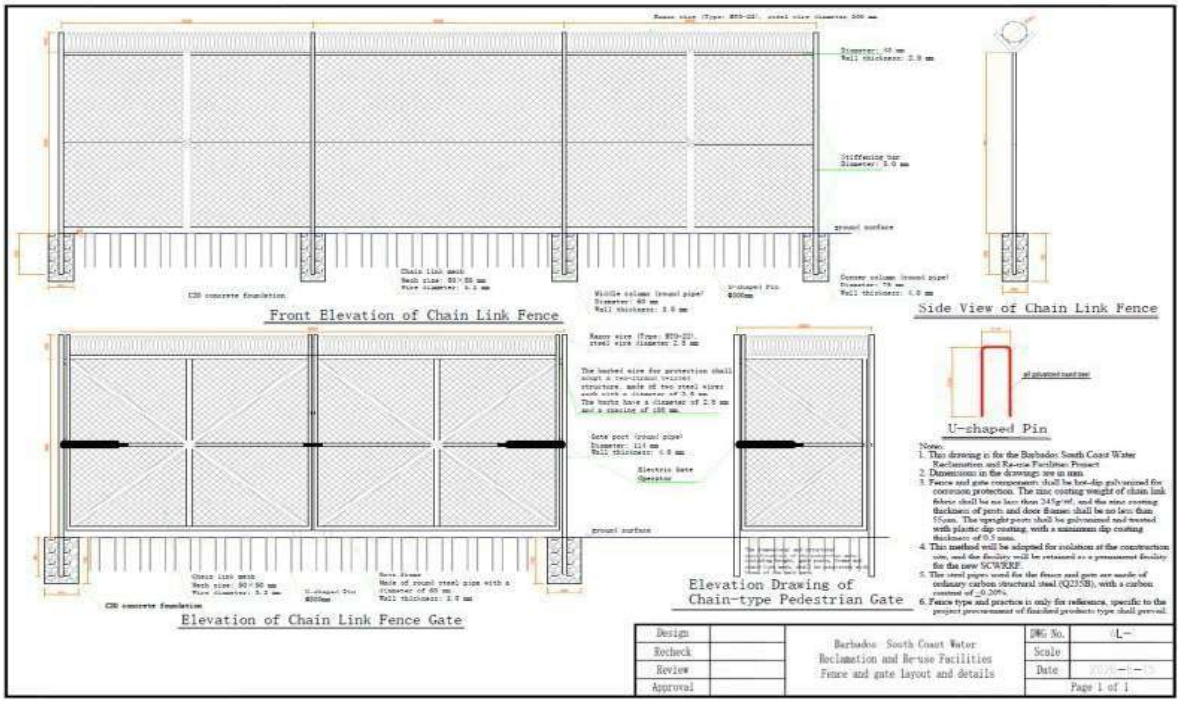


Figure 16: Fencing Arrangements for the Workers' Camp

3.3.3.4. Water supply, storage, and drainage

The Barbados Water Authority (BWA) will provide designated water supply points for the project's domestic and construction water use. Potable water for the compound shall be supplied through the existing municipal water supply network operated by the BWA or by an alternative potable water provider approved by the BWA, if required.

All potable water shall meet national drinking water standards and the World Health Organization (WHO) guidelines for potable water quality. Adequate storage tanks will be procured and installed to ensure a continuous supply. For added context, the camp's Water Supply Plan is outlined in Figure 17 on the following page.

The tanks will be covered, secured, and cleaned quarterly following commissioning, and in any event at least every six months, to ensure the cleanliness of the water they contain. A total of five (5) water storage tanks will be installed at the workers' camp and four (4) at the management camp. The water storage tanks will be cylindrical polyethylene (PE) tanks with a diameter of 1.83 m, a height of 2.65 m, and a storage capacity of 6 m^3 per tank. Following commissioning, the water storage tanks will be cleaned once every three months. Cleaning activities will be scheduled during the low-water-demand period between 09:00 and 11:00 to minimize disruption to camp operations. Responsibility for tank maintenance and cleaning rests with the Camp Logistics Administrator.

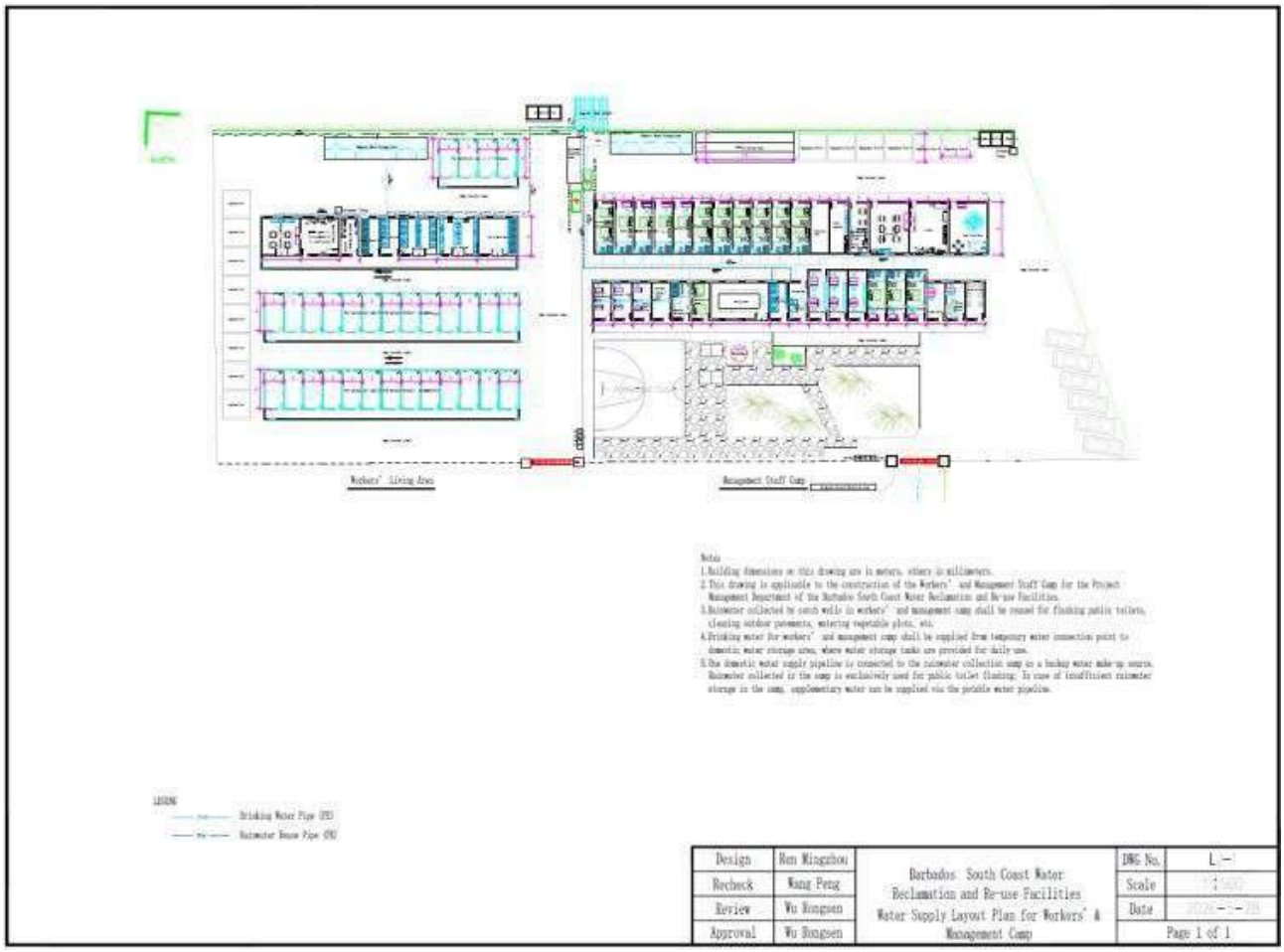


Figure 17: Water Supply Layout Plan

Potable water storage tanks shall be cleaned quarterly (every three months), including immediately following commissioning (see Table 8).

Table 8: Water storage tank cleaning procedure

Stage	Actions
Preparation	Tanks cleaned one at a time to maintain supply. Inlet valve closed and warning signage posted. Water drained and sediment removed. Cover opened and forced ventilation for at least 30 minutes to prevent oxygen deficiency. PPE worn: rubber gloves and boots, face mask, explosion-proof torch.
Physical cleaning and scale removal	Cleaning proceeds cover, inner walls, then base. Heavy scale treated with 5 per cent food-grade citric acid, soaked approximately 10 minutes and rinsed. Interior rinsed by water jet and wastewater discharged through the drain valve.
Disinfection	Sodium hypochlorite solution at 200–300 mg/L available chlorine sprayed over all internal surfaces and pipe connections. Tank sealed with a minimum 30-minute contact time.
Final rinsing and return to service	Tank partially refilled, allowed to stand approximately 5 minutes, drained, then flushed two to three times. Returned to service only when no disinfectant odor is detectable and water quality is satisfactory.

Additionally, the camp plans to install catch pits for rainwater harvesting. The collected rainwater can be used for watering the vegetable plot, cleaning site roads, and various domestic washing activities. In the event of insufficient rainwater supply, the system will be switched to the connected domestic water supply as a backup source to ensure a continuous and stable water supply for these activities.

A catch pit collects rainwater for irrigation of the vegetable plot and for cleaning and dust suppression. Its specification and maintenance regime are given in Table 9.

Table 9: Rainwater catch pit specification and maintenance

Item	Specification
Dimensions and capacity	5 m × 5 m × 2 m internal, giving a maximum storage capacity of 50 m^3; brick masonry construction collecting rainwater runoff within the camp.
Foundation and base	Excavation compacted in layers; 100 mm C15 plain concrete blinding; 150 mm cast-in-place C30 base slab laid to a 0.5 per cent fall towards an internal sediment sump.
Walls	200 mm brick masonry, internally finished with 20 mm waterproof cement mortar.
Cover	Top extends approximately 1 m above ground level, covered with 20 mm timber formwork panels or equivalent to exclude leaves and debris.
Cleaning frequency	Every three months, increased to every two months during periods of heavy rainfall.
Cleaning method	Inflow stopped and standing water pumped out; cover removed and pit ventilated for at least 30 minutes before entry, triggering the confined space procedure. Sediment and debris removed, walls cleaned by soft brush and water jet, inlets and outlets cleared, and the pit flushed. Sludge is bagged and taken to an approved disposal facility and is not stockpiled on site.
Safety	PPE comprising helmet, rubber boots and gloves and high-intensity lighting; a standby attendant remains outside the pit throughout; warning signs and barriers installed around the work area.

Notably, the public sanitary facilities will not utilize a dual water supply system. Instead, a domestic water supply pipeline will be connected to the rainwater catch pit to serve as a supplementary water source. Rainwater collected and stored in the catch pit will be used exclusively to operate the public sanitary facilities. In the event that the stored rainwater is insufficient to meet demand, additional water will be supplied through the potable water distribution system to ensure uninterrupted service. Further details of the water supply network to be put in place are outlined in Figure 18.

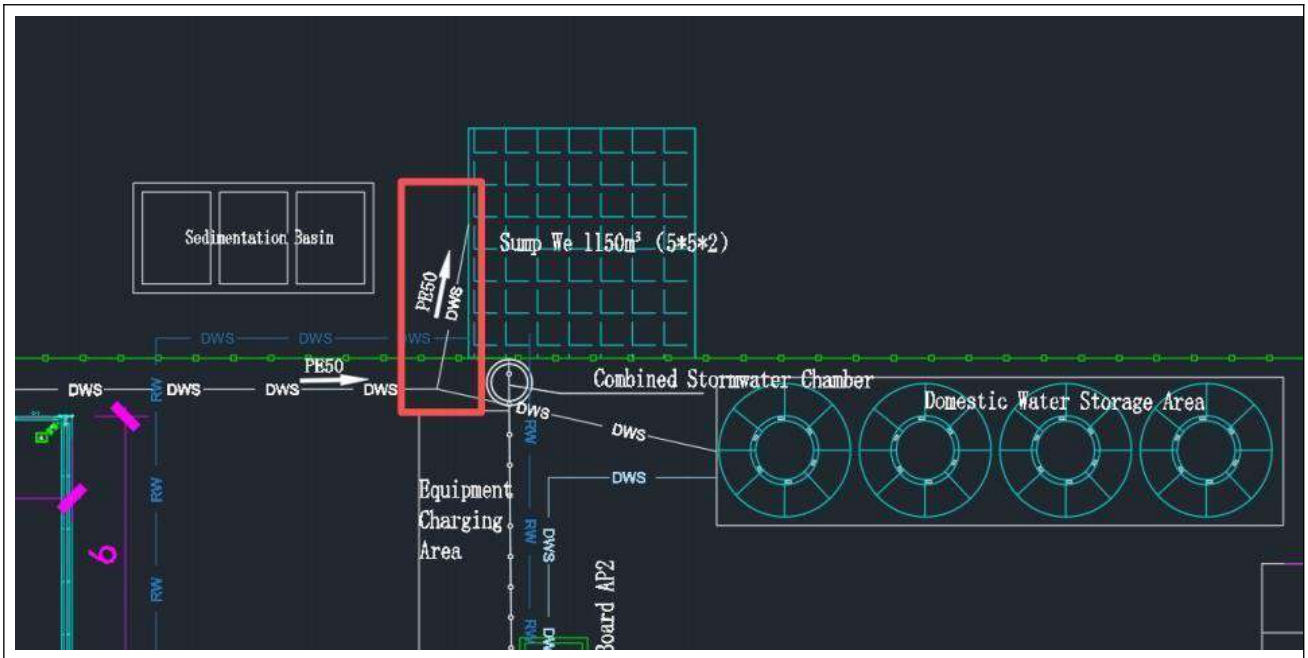


Figure 18: Water Supply Network

The water supply network is shown at Figure 18, and the location of the vegetable plot at Figure 19. CRSEG confirmed in November 2026 that the general layout plan, the camp layout plan and the water and power supply layout plans reproduced here are the current versions.

As noted above, a vegetable plot is proposed at the camp to provide a constant supply of fresh vegetables for meals, supplied from the camp water supply network. The vegetable garden within the workers' camp will measure 4 m × 32 m, with a total area of 128 m^2. The vegetable garden within the management camp measures 4 m × 24 m, with a total area of 96 m^2.

CRSEG confirmed in November 2026 that cultivation is limited to cucumbers, aubergines, tomatoes and chillies, raised from seedlings obtained from local suppliers. Vegetables will be grown using natural cultivation methods. No chemical fertilizers, hydroponic nutrient solutions, or other synthetic growth enhancers will be applied during cultivation. The garden will be established in imported topsoil or a proprietary growing medium obtained from a commercial supplier, not in soil excavated from the campsite, so that produce is not grown in material of unverified quality. The use of night soil is prohibited absolutely, as is the use of any human excreta, sludge or effluent from the camp sanitation system or from the adjacent treatment plant as fertilizer or irrigation water. Irrigation will use the potable supply or harvested rainwater. CRSEG confirmed the prohibition in November 2026 and confirmed that imported topsoil will meet the wording agreed with the Ministry of Agriculture. The prohibition is to be carried into the camp rules, which CRSEG has asked SAEDI to finalize, with compliance verified at the monthly camp inspection and recorded in the inspection log.



Figure 19: Vegetable Plot (enlarged) Location at the Workers' Campsite

3.3.3.5. Power supply and energy management

Electricity for the camp is supplied from the Barbados national electricity grid. CRSEG confirms that construction activities also use grid electricity, except welding machines.

Additionally, CRSEG clarified that the workers' camp photovoltaic equipment comprises standalone solar-powered lighting fixtures used only for lighting. These are not connected to the Barbados national grid, and CRSEG states that no grid-generation licences are required for these standalone fixtures.

Manufacturer datasheets for the solar spotlight and LED luminaires previously reproduced here have been removed. They are product specifications rather than assessment material; the relevant commitment is that LED lighting is installed throughout and that external lighting is positioned and directed to minimize glare and nuisance to nearby residents. Datasheets remain available from the Contractor on request.

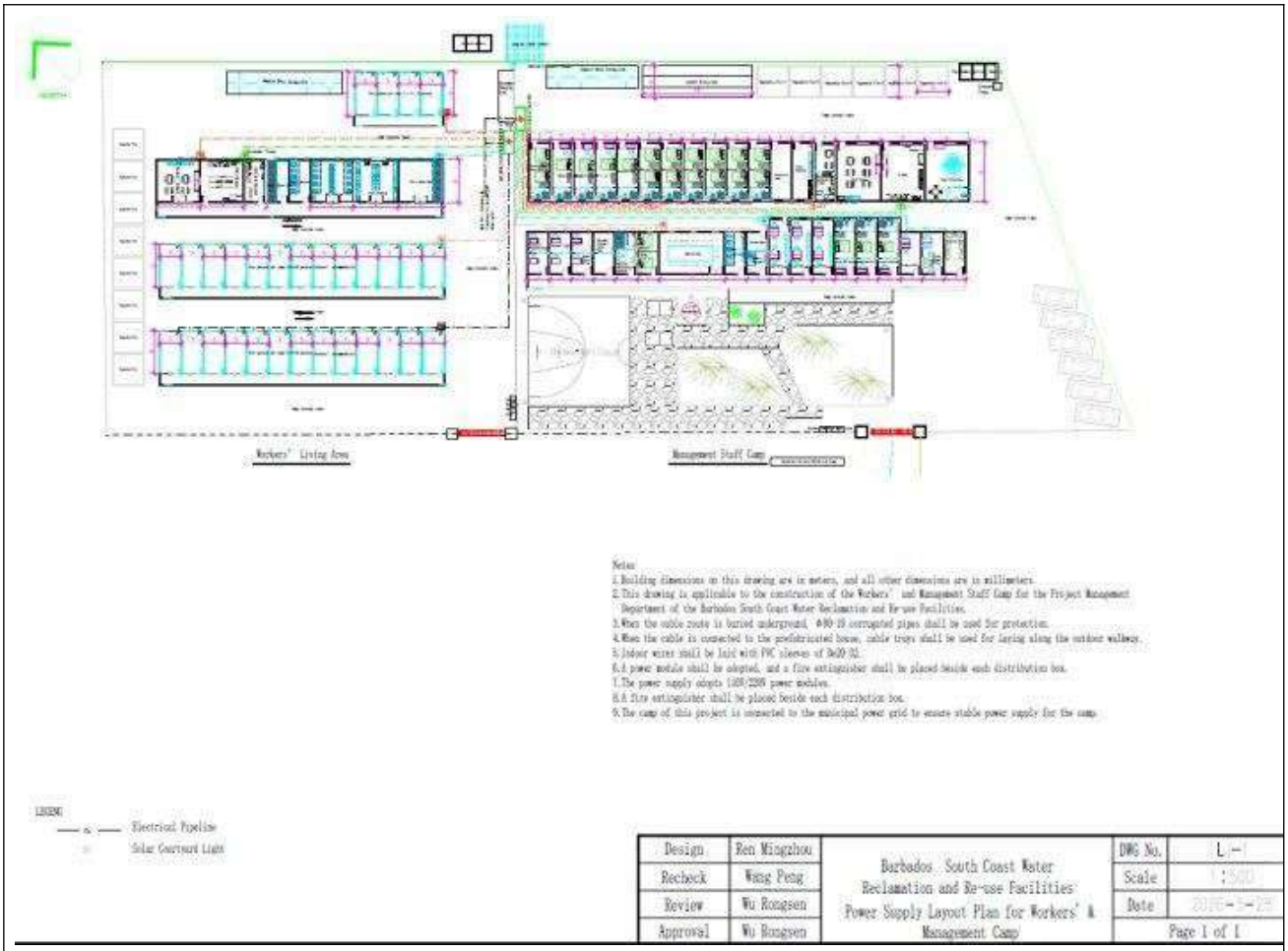


Figure 20: Power Supply Layout Plan

3.3.3.6. Drainage and stormwater management

No drainage or stormwater from the Camp shall enter any area of the GHS, since it will be treated at the existing wastewater treatment plant before discharge. Proper site grading shall ensure adequate drainage. All discharge and/or stormwater shall be directed to approved drainage systems. Additionally, regular drain cleaning will be conducted to prevent blockages. Erosion control measures shall be implemented where required.

Separate three-stage sedimentation tanks will be provided at both the Workers' Camp and the Management Camp for the treatment of domestic wastewater. Treated effluent will be discharged into the nearest SCSTP sewer manhole. The wastewater collection system will utilize 200mm diameter PVC pipes, which will be installed underground. The stormwater drainage system will also utilize 200mm diameter PVC pipes, installed underground. To ensure this system functions at optimum efficiency, a cleaning and maintenance plan has been developed. It is outlined as follows:

The receiving network is the collection system of the existing South Coast Sewage Treatment Plant, and the camp's treated domestic effluent therefore forms part of the influent to that plant. Confirmation of the available capacity and structural condition of the receiving sewer at the point of connection is required from the Barbados Water Authority as network owner and is being sought through the Project Execution Unit. Pending that confirmation, the camp system is designed on the basis that discharge is

limited to treated domestic wastewater from a peak resident population of 120 persons, with no industrial or construction process water entering the foul system.

The following controls apply to the prevention of overflow, backflow, leakage and odor, and are carried into the Environmental and Social Management Plan as monitored commitments, listed below. Responsibility for inspection and maintenance rests with the Camp Logistics Administrator, with oversight by the Health, Safety and Environment (HSE) Officer.

- Sedimentation tanks sized for peak occupancy, with freeboard and desludging on a defined interval.
- A non-return valve on the connection to the SCSTP manhole, to prevent backflow from the receiving network.
- Sealed covers and vented tanks to control odor, with the tanks sited away from dormitories and the canteen.
- Weekly visual inspection of manholes, tank levels and pipe runs, with immediate reporting of any surcharge or seepage.
- A prohibition on the discharge of fats, oils, grease and solid waste to the foul system, reinforced through camp induction.

Drainage channels are cleaned and inspected to the regime in Table 10, with routine cleaning monthly and emergency desilting immediately after heavy rainfall or storm events.

Table 10: Camp drainage channel cleaning and maintenance

Activity	Requirement
Routine cleaning	Floating debris and waste removed on sight. Full manual clean monthly to remove silt and sediment from the channel bed, with particular attention to bends, low-lying sections and dead zones. System flushed with clean water on completion.
Post-rainfall cleaning	Channels inspected after heavy rainfall and any blockage cleared immediately. Deposited sand, silt and leaves removed. Structures, outlets and connecting pipelines checked for obstruction and corrective action taken to prevent ponding, backflow or overflow.
Inspection	Condition inspected weekly. Damage, cracking, leakage or deterioration reported and repaired promptly.
Responsibility	Camp Logistics Administrator supervises, coordinates and accepts the work; additional site workers assigned where sediment accumulation is significant.

3.3.3.7. Storage of construction and operational materials

Construction materials to be used for the camp will include prefabricated material house components, floor tiles, sand and gravel, cement, water supply and drainage pipes, etc. These materials will be stored within the camp area and used progressively during the camp's construction.

All items to be stored onsite for construction and operational purposes are outlined in Table 11.

Table 11: Construction and Operations Material List

No.	Description	Model and Specification	Unit	Qty	Storage Location
1	Sewage Pump	1.5kW, 220v	Set	2	Warehouse No. 1

No.	Description	Model and Specification	Unit	Qty	Storage Location
2	Raincoat	Orange, Split Type w/ Reflective Strips	Set	20	Warehouse No. 1
3	Raincoat	Orange, Split Type w/ Reflective Strips	Set	40	Warehouse No. 1
4	Raincoat	Orange, Split Type w/ Reflective Strips	Set	40	Warehouse No. 1
5	Raincoat	Orange, Split Type w/ Reflective Strips	Set	20	Warehouse No. 1
6	Rubber Rain Boot	Size 40-44	Pair	60	Warehouse No. 1
7	Safety Harness	5-point, shock-absorbing, large hook	Set	40	Warehouse No. 1
8	Safety Helmet	Yellow, National Standard V-Type	Piece	120	Warehouse No. 1
9	Safety Helmet	Red, National Standard V-Type	Piece	30	Warehouse No. 1
10	Safety Helmet	White, National Standard V-Type	Piece	50	Warehouse No. 1
11	Safety Helmet	Blue, National Standard V-Type	Piece	10	Warehouse No. 1
12	Solar LED Light	150W	Piece	6	Warehouse No. 2
13	High-Pressure Washing Machine	220V	Set	2	Warehouse No. 2
14	Summer Workwear for Workers	Long Sleeve Suit	Set	20	Warehouse No. 2
15	Summer Workwear for Workers	Long Sleeve Suit	Set	40	Warehouse No. 2
16	Summer Workwear for Workers	Long Sleeve Suit	Set	40	Warehouse No. 2
17	Summer Workwear for Workers	Long Sleeve Suit	Set	20	Warehouse No. 2
18	Management Uniform	Short Sleeve Shirt	Piece	20	Warehouse No. 2
19	Management Uniform	Short Sleeve Shirt	Piece	20	Warehouse No. 2
20	Distribution Box/Cabinet	Model AL2-6	Set	1	Warehouse No. 2
21	Distribution Box/Cabinet	Model AP3	Set	1	Warehouse No. 2

No.	Description	Model and Specification	Unit	Qty	Storage Location
22	Distribution Box/Cabinet	Model AL3-1	Set	1	Warehouse No. 2
23	Distribution Box/Cabinet	Model AL3-2	Set	1	Warehouse No. 2
24	Distribution Box/Cabinet	Model AL3-3	Set	1	Warehouse No. 2
25	Distribution Box/Cabinet	Model AL3-4	Set	1	Warehouse No. 2
26	Distribution Box/Cabinet	Model AL3-5	Set	1	Warehouse No. 2
27	Distribution Box/Cabinet	Model AL3-6	Set	1	Warehouse No. 2
28	Distribution Box/Cabinet	Model AL3-7	Set	1	Warehouse No. 2
29	Distribution Box/Cabinet	Model AP1	Set	1	Warehouse No. 2
30	Distribution Box/Cabinet	Model AL1-1	Set	1	Warehouse No. 2
31	Floor Tile	800x800mm	m2	203	Warehouse No. 3
32	Floor Tile	300x300mm	m2	114	Warehouse No. 3
33	Cable (Residential Area)	YJV 4x70+1x35	m	65	Warehouse No. 3
34	Cable (Residential Area)	YJV 4x50+1x35	m	231	Warehouse No. 3
35	Cable (External Feed to Residential Area)	YJV 4x185+1x120	m	644	Warehouse No. 3
36	Rainwater Pipe (YS)	DN200 Corrugated Pipe	m	172	Warehouse No. 3
37	Sewage Pipe (WS)	DN300 Corrugated Pipe	m	53	Warehouse No. 3
38	Domestic Sewage Inlet Pipe	PVC Pipe, DN50	m	86	Warehouse No. 3
39	PVC Pipe	DN75	m	62	Warehouse No. 3
40	PVC Pipe	DN110	m	62	Warehouse No. 3
41	PVC Pipe	DN160	m	62	Warehouse No. 3

No.	Description	Model and Specification	Unit	Qty	Storage Location
42	Water Supply Pipe	PPR 32	m	35	Warehouse No. 4
43	Water Supply Pipe	PE50	m	15	Warehouse No. 4
44	Adaptor Connector	PE50 to PR 32	Piece	10	Warehouse No. 4
45	Angle Valve for Water Tank	-	Piece	20	Warehouse No. 4
46	Angle Valve for Sink	-	Piece	30	Warehouse No. 4
47	Angle Valve for Shower Room	-	Piece	30	Warehouse No. 4
48	Mixing Tap	-	Piece	30	Warehouse No. 4
49	Washing Machine Tap	-	Piece	5	Warehouse No. 4
50	High Pressure Hose	L=80cm	Piece	65	Warehouse No. 4
51	Cable (Construction Site)	YJV 4x70+1x35	m	507	Warehouse No. 5
52	Cable (Construction Site)	YJV 4x50+1x25	m	305	Warehouse No. 5
53	BVR Copper Core Cable	6mm2	m	800	Warehouse No. 5
54	Electric Hammer	Corded Type	Set	2	Warehouse No. 5
55	Electric Breaker Hammer	Corded Type	Set	1	Warehouse No. 5
56	Cable Stripping Knife	-	Piece	10	Warehouse No. 5
57	Mist Cannon Sprayer	380v, Fully Automatic, 30m Range	Set	2	Warehouse No. 5
58	Water Boiler	40L	Set	1	Warehouse No. 5
59	Steel Plate	2m x 4m, Thickness 10mm	Piece	4	Warehouse No. 5
60	Steel Plate	2m x 4m, Thickness 16mm	Piece	4	Warehouse No. 5
61	Color Steel Tile	0.96m x 2.5m	m2	350	Warehouse No. 5

The material storage facility is shown in Figure 21.



Figure 21: Material Storage Facility

3.3.3.8. Waste management

Waste management will be handled in accordance with the *CRSEG Integrated Solid Waste Management Plan*, which is integrated into the Environmental Management Plan. Consideration will be given to the expected waste streams, segregation methods, storage arrangements, and collection frequencies, among other focus areas.

At present, there are no plans to implement waste-to-energy recovery or energy utilization of waste generated from the project camps.

Construction waste and domestic waste generated by the project will be collected, transported, and disposed of by a licensed and qualified waste management contractor. Waste collection and disposal will be carried out at least weekly, and more frequently where required to prevent overflow or nuisance, in accordance with Section 8.4.5. Outdoor waste bins will be provided near the entrances of both the Workers' Camp and the Management Camp. Segregation at source and recycling are mandatory under that Plan and are not discretionary at the camp.

The Solid Waste and Hazardous Materials Management Plan at Section 8.4.5 establishes the waste categories and segregation requirements across all three sites. The composition at the camp is narrower than at the plant and the reclamation facility, which also generate demolition waste and process

residuals: camp arisings are principally general waste, organic waste from the canteen, recyclable material, construction waste during the camp build, and small quantities of hazardous waste such as used oils, batteries and lamps. These are segregated at source using the labelled and color-coded containers specified in that Plan. Each stream will be stored separately and collected, transported, and disposed of by local licensed and qualified waste management contractors in accordance with applicable regulatory requirements. The waste management contractor has not yet been identified. When that process is conducted, discussions on the best available and suitable operators will be held.

At this stage, the final disposal location(s) has not yet been confirmed. Therefore, it is currently not possible to determine whether the waste will be transported to a single disposal facility or to multiple approved disposal sites. Details of the disposal facilities will be confirmed by the appointed contractor in accordance with applicable regulatory requirements.

3.3.4. Camp construction activities

Given the project's scope, the execution of these steps will merge international standards (such as the IDB/GCF Environmental and Social Policy Frameworks for Category B projects) with local statutory mandates from the Barbados Environmental Protection Department (EPD), the Planning and Development Department, and the Barbados Water Authority (BWA). The primary camp construction activities are outlined below, in the intended execution sequence.

The construction sequence is as follows.

1. Vegetation clearing
2. Site levelling and compaction
3. Installation of underground water supply and drainage pipelines, and construction of building foundations
4. Installation of prefabricated buildings, together with construction of supporting facilities
5. Installation of water and electrical systems
6. Construction of ancillary facilities
7. Final finishing works, including the installation of camp fencing

The machinery parking location is shown at Figure 22.



Figure 22: Machinery Parking Location (highlighted in yellow)

1. **Vegetation Clearing:** The first activity entails the removal of weeds, trees, and other vegetation within the camp area. Clearing will be done within the boundaries of the identified project area, as guided by visible boundary irons/sticks around the perimeter. Prior to site clearing, the clearing boundaries will be demarcated throughout the site. An excavator will then be used to remove the existing surface vegetation. This is to prevent unnecessary environmental degradation and/or soil exposure beyond the approved working boundaries. Site clearing activities will be suspended during rainy weather.

   If mature or protected tree species are on-site, formal permission will be sought from the *Natural Heritage Department within the Ministry of Environment, Water Resources and Drainage* (and/or any other relevant authorities) before this activity can commence. Clearing activities will include the controlled removal of weeds, shrubs, trees, organic debris, and any unsuitable materials within the designated camp area.

   Any topsoil stripped during this phase will not be discarded. If possible, it will be stockpiled separately and covered with tarpaulins to prevent dust or rainwater erosion. The intention is to preserve the topsoil for future landscaping and the designated vegetable garden plot. No night soil will be used for landscaping or the vegetable garden plot. The cleared vegetation will be temporarily stored in the open area on the northern side of the plant site and subsequently collected, transported, and disposed of by a licensed waste management company. On-site burial or open burning of vegetation is strictly prohibited. The locations of the temporary vegetation storage area and topsoil stockpile area are shown in Figure 23.

The Contractor will also implement applicable erosion and sediment control measures, such as silt fences, berms, drainage channels, and sediment traps. The Contractor's soil erosion and sediment control measures will include:

- Exposed soil stockpiles will be fully covered with green geotextile mesh (soil cover netting). Standard flood-control sandbags (25 cm × 50 cm) will be stacked around the perimeter of the soil stockpile areas to form a continuous protective barrier. This barrier will intercept surface runoff and prevent rainfall-induced erosion and sediment discharge from the stockpiled soil.
- Following rainfall events, any sediment accumulated on the inner side of the sandbag barriers will be promptly removed. Damaged or displaced sandbags will be replaced immediately to maintain the effectiveness of the control measures.
- The construction of the new water treatment plant will incorporate the installation of drainage ditches and sedimentation ponds as part of the overall site drainage and erosion control system.

Additionally, the Contractor will restrict clearing works to daylight hours to minimize any disturbance to nearby communities. Notably, where feasible, any existing mature vegetation outside the immediate work area can be preserved to provide natural windbreaks, dust reduction, and visual buffering for the campsite.

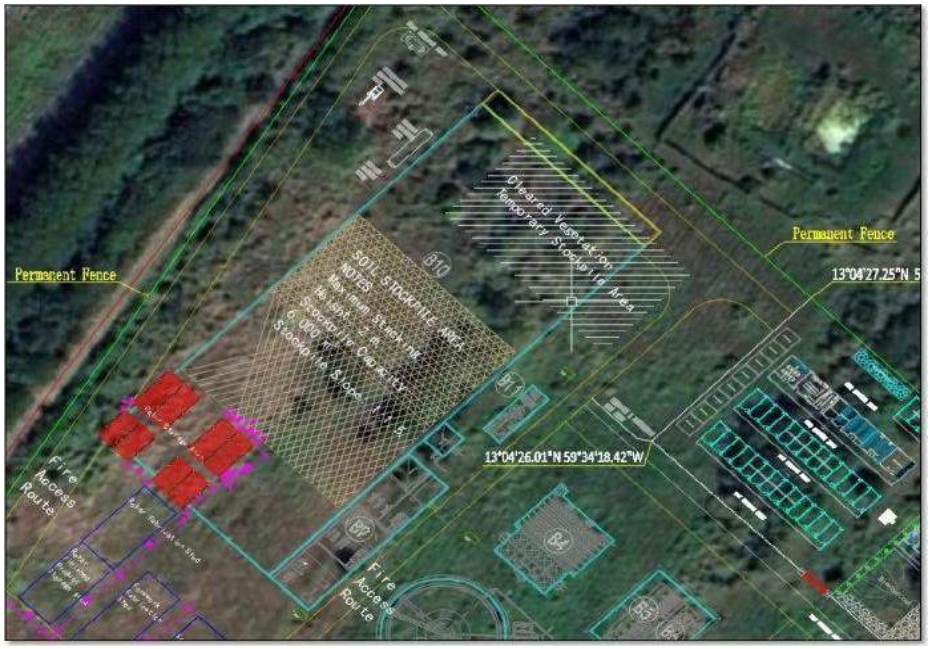


Figure 23: Locations of the temporary vegetation storage area and topsoil stockpile area

2. **Site leveling and Compaction:** Following clearing, the site shall be graded and levelled to achieve adequate drainage, structural stability, and safe access throughout the camp. Compaction activities shall be performed using approved compaction equipment tested to achieve a suitable bearing capacity for prefabricated structures, utilities, and traffic loads. As such, the Contractor will conduct appropriate compaction testing to verify engineering requirements. In areas with weak or saturated soils, geotextiles or additional stabilization methods may be required.

This type of activity may require continuous dust mitigation, such as regular watering down of exposed earth to prevent airborne particulates from migrating beyond the project site. This will be discussed further in the mitigation measures section of this document.

Special consideration will also be given to Barbados' heavy rainfall periods and hurricane vulnerability by ensuring the camp platform is elevated where necessary and resilient against flooding and stormwater accumulation. The crushed stone and coral layer will be used to provide a stable, mud-free platform for heavy equipment, which will reduce tire-tracking of mud onto the nearby public road while acting as a permeable base that manages localized stormwater infiltration.

Specific steps to facilitate applicable site leveling and compaction for the site will include the following:

- The site will be improved through ground replacement and filling using 0–160 mm marl aggregate, which will provide adequate durability, drainage performance, and bearing capacity for the intended use. Upon completion of the filling works, the material will be compacted in layers using a roller to achieve the required density. The finished floor level of the camp buildings will be maintained 200 mm above the surrounding ground level.
- A minimum site drainage gradient of 2% will be provided throughout the camp area to direct stormwater towards the drainage channels. Roof gutters will also be installed along the building eaves, with rainwater conveyed through downpipes into the underground stormwater drainage system.
- Flood-control sandbags will be maintained on site. During periods of heavy rainfall or flooding, sandbags can be rapidly deployed to form temporary flood barriers to prevent external floodwater from entering the camp area. Any damaged or displaced sandbags will be promptly replaced to ensure continued effectiveness.

3. **Installation of underground water supply and drainage pipelines, and construction of building foundations**: The Contractor will install water supply and drainage pipelines, and pour the building foundations, which shall be monolithically cast with concrete. The underground utility installation shall include potable water pipelines, wastewater drainage systems, stormwater conveyance systems, electrical conduits, and communication lines. Utility corridors will be clearly identified and protected during subsequent construction phases.

   The building foundations will adopt a concrete structure. Concrete work will include proper curing, quality control testing, and safe handling of cement materials to reduce dust exposure and runoff contamination. Stormwater management during this phase will also include runoff diversion and sediment control to protect adjacent environments and coastal waters.

   The camp utility systems are arranged as set out in Table 12.

Table 12: Camp utility infrastructure

System	Arrangement
Potable water supply	Polyethylene (PE) pipe throughout. Main 50 mm diameter, branches 32 mm, distributing to all water-use facilities and rooms.
Wastewater collection	PVC pipe throughout. Main sewer 200 mm diameter, branches 160 mm, collecting from toilets, kitchens, shower rooms and washrooms. Treated through a three-stage sedimentation tank before discharge to the nearest SCSTP sewer manhole.

System	Arrangement
Stormwater drainage	200 mm diameter PVC collecting roof and ground runoff, conveyed to the rainwater catch pit.
Electrical and communications conduit	Cables installed in PVC conduit sized by circuit: De20 for general outlets, lighting and communications; De25 for air-conditioning and canteen equipment; De32 for main feeders from distribution boards. Communications cables run in dedicated conduit separate from power.

4. **Installation of prefabricated buildings, together with construction of supporting facilities:** At this stage, the Contractor will commence the erection of prefabricated houses, proceeding sequentially from north to south. Meanwhile, construction will also commence on ancillary facilities such as sedimentation tanks and catch pits.

The north-to-south construction sequence optimizes on-site crane and machinery positioning, preventing unnecessary back-and-forth transit over unpaved ground, which drastically reduces secondary dust generation. The erection of prefabricated camp structures will be conducted sequentially and in accordance with manufacturer specifications, structural engineering requirements, and local building regulations. Additionally, the Contractor will ensure that all prefabricated units are securely anchored to withstand high winds and severe weather conditions.

Supporting facilities such as sedimentation tanks, septic systems, sump wells, and drainage infrastructure shall be installed concurrently to ensure environmentally sound wastewater and stormwater management.

The construction details of the proposed prefabricated structures are outlined below:

The prefabricated structures and their supporting works are built to the specification in Table 13.

Table 13: Prefabricated building and supporting works specification

Element	Specification
Main structure	150 mm compacted crushed stone sub-base; 50 mm C15 concrete foundation; prefabricated panel structure erected over it.
Water supply	Vertical pipes fixed to walls, horizontal branches along ring beams and wall bases.
Electrical	Flame-retardant PVC cable trunking, surface mounted and kept clear of wet areas. Distribution boards earthed with a main residual current device and branch breakers. Power and communications cables routed separately. Steel components and metal enclosures bonded to earth, grounding resistance not exceeding 4 Ω.
Lighting	Fittings arranged uniformly with moisture-resistant sealing; circuit-by-circuit commissioning.
Air conditioning	Indoor units set to a minimum 1 per cent drainage fall; outdoor units positioned for adequate ventilation.
Sanitary fixtures	Showers, toilets and wash basins installed and connected to water supply and drainage.
Ceilings and floors	Light-gauge steel ceiling framing fixed to roof purlins at hanger spacing not exceeding 1.2

Element	Specification
	m; floor tiling on a 30–50 mm dry mortar bed.
Buried pipework	Trenches machine-excavated leaving approximately 100 mm for hand trimming. PPR and HDPE water pipe heat-fusion welded, mains before branches. PVC drainage solvent-welded; corrugated pipe on rubber-ring socket joints.
Sump pit	Brick-built, 5 m × 5 m × 2 m, approximately 50 m^3, for stormwater collection. 100 mm C15 blinding and 150 mm C30 base slab over compacted formation.
Sedimentation (septic) tank	Brick-built, 4.9 m × 2.0 m × 1.8 m, approximately 15 m^3. Compacted base with blinding and 150 mm sloped floor slab; walls and internal partitions in brick masonry.

5. **Installation of water and electrical systems:** At this stage, water and electrical installation works shall be conducted. Please see the previous section (Section 4: Installation of prefabricated building) - *II. Water Supply and Drainage Pipe Installation and III. Electrical Cable Conduit Installation* for additional details. Simultaneously, interior floor tiling and ceiling construction will also be undertaken. This phase includes installation of water distribution systems, electrical wiring, lighting, air conditioning systems, drainage fixtures, sanitary facilities, and interior finishing works such as floor tiling and ceiling installation.

All electrical work will comply with recognized electrical safety standards and be performed by qualified personnel. Water conservation and energy efficiency measures will be integrated wherever practical. Such activities are discussed further in the mitigation section of this document.

6. **Construction of ancillary facilities:** For the additional comfort of staff and other people using the camp, ancillary facilities will also be included. Such facilities will include clothes drying sheds, vegetable garden areas, walkways, shaded rest areas, and a basketball court. The details of these areas can be seen on the previous site layout diagrams shared in the earlier sections.

7. **Final finishing works, including installation of camp fencing:** Final works shall include installation of perimeter fencing, entrance gates, signage, landscaping, drainage improvements, road surfacing, and final cleaning activities. Security systems, emergency response equipment, and safety infrastructure should also be fully operational before occupancy.

The perimeter fence of the project site is proposed to be a permanent fence, which will also serve as the external security fence for the camp area. The final design and specifications of the permanent fence are subject to approval through the project review process. Detailed information is provided in the drawing previously outlined in Figure 14: Fencing Arrangements for the Workers' Camp.

8. **Commissioning:** Before commissioning, the camp will undergo a final comprehensive inspection and verification process to ensure compliance with health, safety, environmental, and operational requirements. Final inspections will include items such as electrical, plumbing, and wastewater systems; verification of fire protection systems and emergency preparedness measures; testing of potable water quality; inspection of drainage systems for proper flow and erosion control; and waste management arrangements. The details of these activities are listed below.

Camp Inspection Verification

- *Inspection Schedule:* The final comprehensive camp inspection shall be conducted at the following stages:

- Upon completion of camp construction and installation of all supporting facilities;
- After all corrective actions have been closed and internal pre-acceptance inspections have been completed;
- At least seven (7) working days prior to the occupancy of the first personnel or the official commissioning of the camp.

- *Responsible Personnel:*

(1) Organizing Party: The Contractor's Project Management Team shall be responsible for organizing and implementing the final comprehensive inspection.

(2) Inspection Team Members: The inspection team shall comprise the following personnel: - *The named individuals above are the personnel proposed for these functions in the Contractor's technical proposal. Where a post-holder changes, the Contractor will notify the Project Execution Unit before the inspection is undertaken*.

- *Project Manager (Wu Rongsen)*: Approval of the inspection plan and acceptance results;
- *Quality Manager (Wang Peng)*: Responsible for inspection records and verification of compliance;
- *HSE Officer (Wu Dequan)*: Responsible for health, safety, social and environmental compliance inspections[17];
- *Mechanical Engineer (Ren Mingzhou)*: Verification of power supply, water supply, fire protection, and electromechanical facilities;
- *Administration Officer (Wu Pengbo)*: Verification of camp operational readiness and accommodation conditions;
- Environmental and Social Manager (to be appointed by the Contractor): Responsible for social and gender compliance at the camp, including living conditions, the application of camp rules and welfare standards against the contractual and national legal requirements, the operation of the Code of Conduct and the grievance mechanism within the camp, and verification of these matters at inspection. This post has not yet been filled and must be named by CRSEG before the camp is commissioned.
- *Employer's Representative:* Participation in joint inspections and witnessing of acceptance activities;
- *Local Regulatory Authority Representatives (where required by regulations):* Conduct statutory inspections and confirm permitting requirements.

Pre-occupancy commissioning covers each functional area of the camp against a defined scope of inspection, set out in Table 14.

[17] A local officer will be hired to complement Mr. Dequan in ensuring social compliance.

Table 14: Commissioning inspection agenda

Area	Scope of inspection
Health management	Potable water supply system, kitchen hygiene, food storage, sanitary facilities and waste handling.
Safety management	Fire extinguisher provision and placement, evacuation routes and assembly points, emergency lighting and electrical safety.
Environmental management	Wastewater collection and treatment, stormwater drainage, waste segregation and storage, and control of spillage.
Social and gender management	Availability and condition of separate accommodation and sanitary facilities for women and men, operation of the Code of Conduct and grievance mechanism within the camp, display of worker-facing information in the languages spoken on site, and welfare standards against contractual and legal requirements. Conducted by the Environmental and Social Manager.
Operational management	Dormitory facilities and occupancy readiness, dining and communal areas, offices and camp services.

Evaluation of Inspection Results:

Upon completion of the inspection, the camp shall be evaluated in accordance with the following criteria (see Table 15):

Table 15: Site Inspection Evaluation Rating

Rating	Description
Compliant	All requirements are satisfied, and the camp is approved for operation.
Conditionally Compliant	Minor deficiencies exist; the camp may be approved for operation subject to completion of corrective actions.
Non-Compliant	Major deficiencies exist; the camp shall not be approved for operation. All corrective actions are urgent.

All inspection findings shall be documented in the final *Camp Inspection Checklist*.

- Corrective Actions and Close-Out Requirements:

- All findings identified during the inspection shall be entered into the *Action Tracking Register* for monitoring and close-out.
- The camp shall not be approved for occupancy or operation until all major non-conformities have been satisfactorily closed.
- Completion of corrective actions shall be jointly verified and signed off by the HSE Officer, Quality Manager, and Project Manager.
- Formal operation of the camp may commence only after approval has been granted by the Client/Client Representative.

List of Equipment/Machinery to be used at the Workers' Camp

Table 16: List of Equipment/Machinery to be used at the Workers' Camp

Equipment Name	Specification and Model	Quantity	Manufacturer	Year of Manufacturer	Equipment Status	Country of Production	Place of Origin
Excavator	SY365	1	Sany Heavy Industry Co., Ltd	2022	GOOD	CHINA	CHINA
Forklift	CPCD35-Q25K2	1	Shanghai Heli Forklift Truck Co., Ltd	2026	GOOD	CHINA	CHINA
Road Roller	SSR180C-10	1	Sany Heavy Industry Co., Ltd	2023	GOOD	CHINA	CHINA
Concrete Mixer	JH600	1	LONTA MACHINERY Co. Ltd	2024	GOOD	CHINA	CHINA
Generator	5.5Kw	1	LONTA MACHINERY Co. Ltd	2024	GOOD	CHINA	CHINA

3.3.5. Analysis of Alternatives: SCWRRF

The Barbados environmental impact assessment process and Performance Standard 1 both require an analysis of alternatives. Alternatives are assessed against water security benefit, environmental risk to confirmed Critical Habitat, social acceptability, technical feasibility and cost. The position of the site within the watershed draining toward Graeme Hall Swamp carries particular weight in every comparison.

3.3.5.1. The No Project Alternative

Under the no project alternative the South Coast Sewage Treatment Plant continues to discharge treated effluent through the existing conveyance running south through the wetland toward the sluice and the coastal outlet. No reclaimed water is produced, no aquifer recharge occurs, and irrigation demand continues to draw on potable supply.

Three consequences follow. Barbados is classified among the most water-scarce countries in the world on a per capita renewable freshwater basis, and the island depends on a limestone aquifer that is vulnerable to saline intrusion and to contamination from surface sources. Foregoing a reclaimed water source therefore leaves irrigation demand competing with potable supply during drought, which the HSE Management Manual identifies among the twelve natural hazards affecting this Project.

The existing conveyance and its two pumping stations remain within Critical Habitat, and the emergency bypass to the Graeme Hall Bisecting Canal remains the failure route. Field verification in August 2026 recorded the sluice gate as apparently inoperable. The no project alternative therefore preserves an arrangement in which a plant failure discharges toward the Ramsar wetland.

The climate resilience objective of the wider Project is not met. The no-project alternative is rejected on those grounds.

3.3.5.2. Site Alternatives

The selected site lies immediately north of the Graeme Hall wetland, adjacent to the existing treatment plant, on land assessed by field verification as brushland and shrubbery in Good condition with several mature trees including mahogany and lignum-vitae.

Three considerations bear on site selection. Adjacency to the existing plant removes the need for a long transfer main, and a longer conveyance would itself introduce construction impacts along its route and a leakage pathway over its operating life. The site sits within the same watershed as the plant it serves, so the hydrological relationship with the wetland is a feature of the location, and it is present for any candidate site in this area. Land availability adjacent to an operating public utility is limited on the developed south coast.

Against those considerations, the site sits upslope of confirmed Critical Habitat and drains it through a natural gully along the eastern boundary. That is the principal environmental argument against the location, and it is the reason the runoff and sediment pathway at PRJ-EI-01 carries the highest pre-mitigation rating in this assessment.

The comparative assessment of candidate sites, and the basis on which the selected site was preferred, is recorded in the design and option study documentation.

3.3.5.3. Treatment Technology Alternatives

Reclaimed water for aquifer recharge and for agricultural irrigation requires treatment beyond the preliminary screening provided by the existing plant. Technology alternatives are compared on the reclaimed water quality achieved, energy demand, chemical usage, sludge production, footprint and operational complexity.

Energy demand carries additional weight on this Project. The Contract stipulates a non-carbon emissions agreement, and the Contractor is required to measure the carbon footprint through construction and operation. A treatment train with lower energy intensity therefore performs better against a contractual commitment as well as against operating cost.

Chemical usage carries weight because chemical storage adjacent to a drainage pathway toward Critical Habitat is identified in the Critical Habitat Impact and Significance Matrix as capable of causing material degradation in the event of a substantial uncontrolled release. A process requiring smaller volumes of fewer hazardous reagents reduces that exposure at source.

Sludge production carries weight because handling, storage and disposal introduce their own pathways, assessed at PRJ-EI-10.

3.3.5.4. Reuse Configuration Alternatives

Three configurations are available: aquifer recharge alone, agricultural irrigation alone, or a combination of the two.

Aquifer recharge addresses the long-term security of the limestone aquifer and offers storage that irrigation supply cannot. It carries the higher receptor risk, since reclaimed water entering groundwater is difficult to recover, and the aquifer is a potable source. Karst geology transmits water rapidly and with limited natural filtration, which shortens the travel time available for attenuation.

Agricultural irrigation delivers a direct and visible benefit to farmers, who the Ministry of Agriculture has advised currently pay one Barbados dollar per cubic meter for irrigation water. The receptor pathway runs to crops, to farm workers and to consumers, and is managed through quality specification at the point of use and through restrictions on crop type where appropriate.

A combined configuration spreads demand across two outlets, which reduces the consequence of either outlet becoming unavailable and allows reclaimed water of differing quality to be directed to the use each is suited to. It requires two sets of monitoring and two sets of user agreements.

3.3.5.5. Construction Method and Timing Alternatives

Timing alternatives are assessed against the wet season and the hurricane season. Earthworks and vegetation clearance carried out during the June to November period coincide with the highest rainfall and with tropical cyclone risk, and both increase the runoff and sediment pathway to the wetland assessed at PRJ-EI-01. Scheduling bulk earthworks outside that window reduces the pre-mitigation exposure without requiring any additional control measure.

Timing also interacts with the SCSTP upgrade. Concurrent construction on both footprints during the wet season is identified at Section 7.8 as the cumulative combination of greatest concern.

3.3.5.6. *Preferred Alternative*

The preferred alternative is construction of the reclamation facility on the site adjacent to the existing treatment plant, producing reclaimed water for a combined configuration of aquifer recharge and agricultural irrigation, with bulk earthworks scheduled outside the June to November, wet and cyclone season.

The basis for that preference is as follows. Proceeding in this way meets the water security objective that the no-project alternative forfeits, and it removes the routine discharge of treated effluent through the wetland conveyance. The selected site avoids a long transfer main and its associated construction and leakage pathways, and site availability adjacent to an operating public utility on the developed south coast is limited. A combined reuse configuration spreads demand across two outlets and allows reclaimed water to be directed to the use each quality is suited to. Scheduling bulk earthworks outside the wet season reduces the runoff and sediment exposure at PRJ-EI-01 without requiring an additional control measure.

The preference is conditional on the safeguards at Section 8.3, and in particular on the construction footprint remaining outside wetland habitat, on erosion and sediment controls being installed before significant ground disturbance, and on hazardous material storage being sited away from drainage pathways connected to the wetland.

3.4. Project Area of Influence

The Area of Influence (AoI) defines the spatial limits within which Project effects are assessed. It is established separately for direct and indirect pathways, and separately again for the Critical Habitat assessment, because the three follow different logics: physical exposure attenuates with distance, socio-economic interaction follows patterns of movement and use, and ecological effect follows hydrological and habitat connectivity rather than proximity.

The AoI is common to the plant upgrade and the reclamation facility as well as the workers' camp (the latter being a temporary structure). The two main and more permanent sites occupy adjacent footprints, share an access route and a receiving environment, and are constructed on overlapping programs, so a boundary drawn for one would in practice be a boundary for both.

3.4.1. Direct Area of Influence

The Direct Area of Influence (DAI) comprises the area within which Project activities may cause a measurable change in a receptor.

For physical exposure pathways, involving particulates, noise, vibration and odor, it extends approximately 500 meters (0.31 miles) from the site boundary. The nearest residential area lies approximately 250 meters (0.16 miles) to the southeast.

For socio-economic pathways it extends approximately 1 kilometer, or 0.62 miles, from the site boundary, within which interactions between Project personnel, residents, informal vendors, businesses and service providers are most likely to occur.

It further comprises the construction access route including the approach through Harmony Hall, and the drainage pathway from the site through the eastern gully to the eastern margin of the Graeme Hall wetland.

Figure *24* shows the direct area of influence of the SCSTP and SCWRRF facilities.

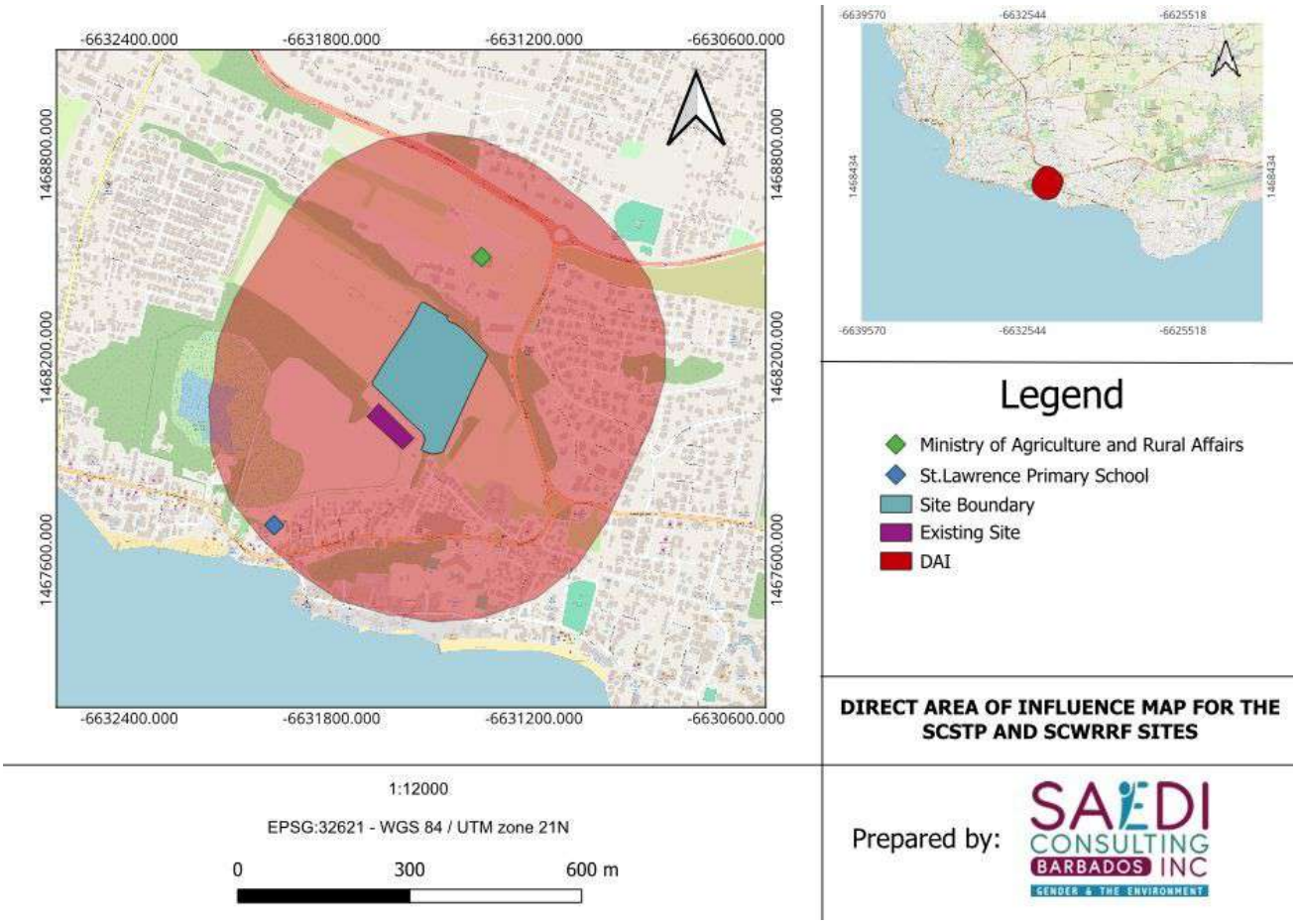


Figure 25: Direct Area of Influence of the SCSTP and SCWRRF Facilities

3.4.2. Indirect Area of Influence

The Indirect Area of Influence comprises:

- The Graeme Hall wetland system as a whole, including the Eastern Marsh, the Upper Drainage, the Bisecting Canal, the Nature Sanctuary and the Southern Wetland Interface.
- The coastal zone downstream of the sluice gate.
- The aquifer receiving reclaimed water recharge.
- Agricultural land receiving reclaimed water.
- Haulage, delivery and disposal routes and the communities situated along them.
- Health and public services receiving Project-generated demand.

The Indirect Area of Influence is not expressed as a fixed radius. Its extent follows the hydrological system, the reuse distribution arrangements and the haulage network.

Figure 26 shows the indirect area of influence for the SCSTP and SCWRRF facilities.

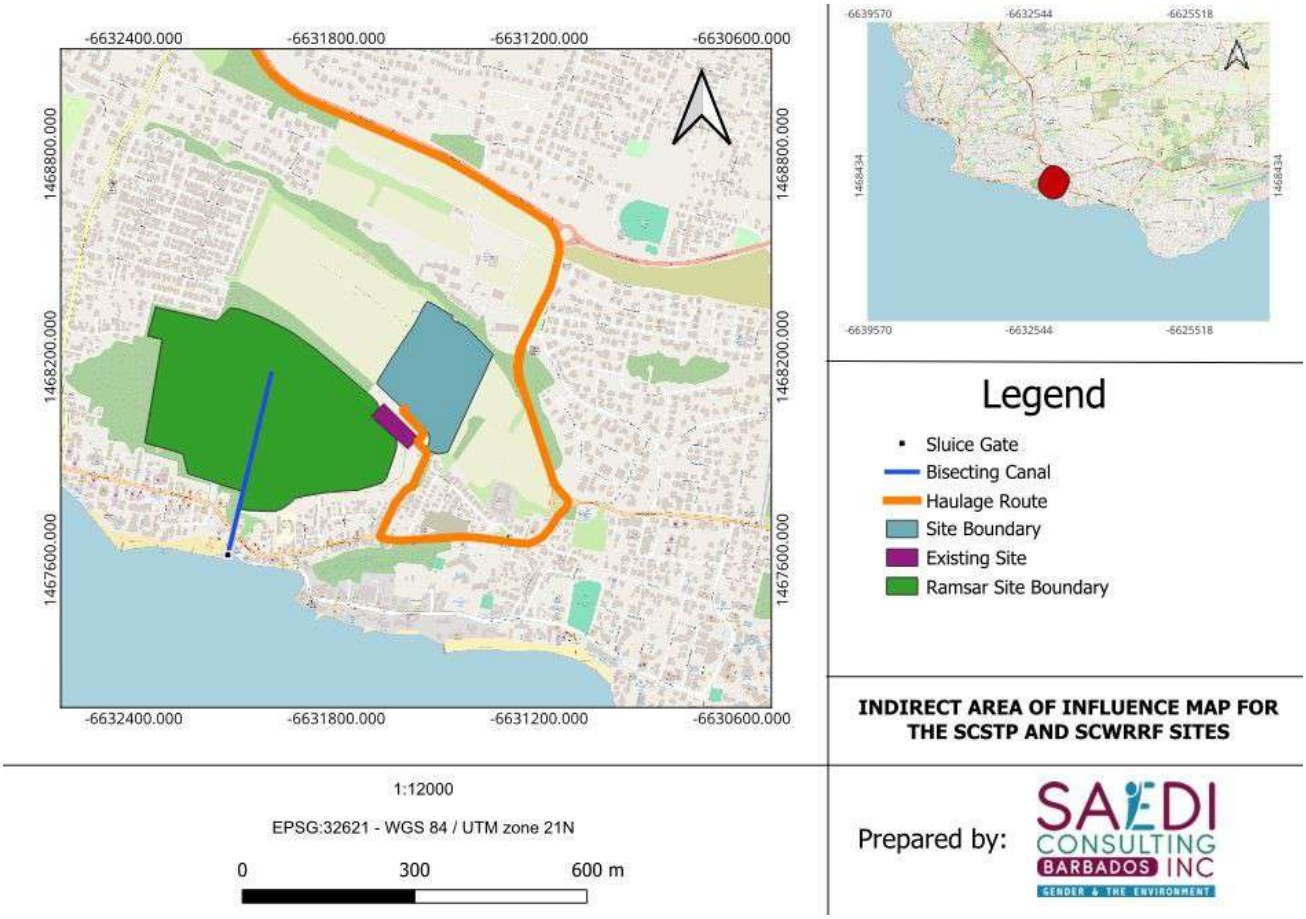


Figure *26*: Indirect Area of Influence for the SCSTP and SCWRRF Facilities

3.4.3. Critical Habitat Assessment Area

The Critical Habitat Assessment Area is the area over which Critical Habitat is screened and Project impact pathways assessed. It is defined on an ecological basis rather than as a distance from the site, because the IDB framework requires Critical Habitat to be delineated by the extent of the habitat and the processes that sustain it. It overlaps the Indirect Area of Influence at Section 3.4.2 but serves a narrower purpose: the Indirect Area of Influence captures every receptor the Project may reach, while this area captures only the habitat and the ecological processes relevant to the Critical Habitat determination. It comprises three nested units.

The Core Critical Habitat Area is Ramsar Site No. 1591, Graeme Hall Swamp, with its connected units: the Eastern Marsh, the Upper Drainage, the Bisecting Canal, the Nature Sanctuary and the Southern Wetland Interface. It is mapped at Figure 60.

The Project and Habitat Interface Area is the ground across which a Project pressure can physically reach the Core Area, comprising the drainage pathway from the site through the eastern gully to the eastern margin of the Eastern Marsh, the site margins adjoining agricultural land and Graeme Hall Road, and the construction access route through Harmony Hall. It is mapped at Figure 61.

The Functional Ecological Influence Area is the wider zone within which the processes sustaining the Core Area operate: the interconnected wetland drainage system upstream and downstream of the Core Area, the coastal connection downstream of the sluice gate, and the aquifer receiving reclaimed water recharge. Its extent follows the hydrological system rather than a measured radius. It is mapped at Figure 61.

The screening and determination are at Section 7.5 and Annex D, the impact and significance assessment at Annex E, and the mitigation, monitoring and follow-up actions at Annex F. The methodology, including the significant conversion or degradation test, is at Section 5.4.

3.4.4. Project Site Boundary and Coordinates

The Contractor has confirmed the site boundary by survey, shown at a drawing scale of 1 to 1,750 on the Project Site Boundary and Coordinates drawing. The boundary is defined by the following corner coordinates.[18]

Table 17 presents the project site boundary coordinates.

Table 17: Project site boundary coordinates

Corner	Latitude	Longitude	Setting
North	13 04 31.99 N	59 34 19.42 W	Northern extent, adjoining agricultural land
East	13 04 27.11 N	59 34 13.01 W	Eastern extent, adjoining Graeme Hall Road
South-east	13 04 17.96 N	59 34 17.39 W	Southern extent, adjoining agricultural land
South	13 04 18.21 N	59 34 19.47 W	Southern extent, adjoining Harmony Hall
West	13 04 24.52 N	59 34 24.13 W	Western extent, above the existing South Coast Sewage Plant

What this table shows: *The surveyed corners of the site. Read against the drawing, they put the existing sewage plant inside the western edge of the site, Graeme Hall Road along the eastern edge and Harmony Hall immediately to the south. The houses assessed for traffic, dust and noise are next to the site and not some distance from it.*

Three features of the confirmed boundary bear on the assessment. The existing South Coast Sewage Plant lies immediately to the south-west of the site, inside the western boundary line, which confirms the adjacency assumed throughout and the shared access arrangement. Graeme Hall Road forms the eastern edge, and Harmony Hall lies immediately to the south, which places the residential receptors directly adjoining the southern boundary. The land within the boundary is agricultural and scrub,

[18] CRSEG Project Site Boundary and Coordinates drawing, 2026, drawing scale 1 to 1,750, corner coordinates for the northern, eastern, south-eastern, southern and western extents of the Project site. (China Railway Shanghai Engineering Group Co., Ltd., 2026)

consistent with the brushland and shrubbery recorded during ecological field verification, and existing vegetation within the boundary will be cleared.

Excavation of approximately 50,000 cubic meters and backfill of approximately 20,000 cubic meters are estimated within this boundary, giving a net export of approximately 30,000 cubic meters.

4. Legislative and Institutional Framework

This section sets out the legal and institutional requirements the Program must satisfy and identifies where those requirements bear on the assessment and the management measures. It covers applicable national legislation, the Inter-American Development Bank Environmental and Social Performance Standards including the specific requirements arising under ESPS 6 where Critical Habitat is confirmed, the contractual requirements binding the Contractor, relevant international guidance, and the capacity of the enabling environment to give effect to all of it.

The last of these carries particular weight. A requirement that exists in law but is not enforced in practice does not deliver the protection the assessment assumes when it assigns a residual rating, so the assessment records where compliance depends on institutional capacity and treats that dependence as a risk rather than as a given.

The legislative and institutional framework applies to the entire Program, governing both the SCSTP upgrade and the SCWRRF. Because the two facilities occupy adjacent footprints on the same site and share receptors, the same national laws, IDB safeguard requirements, and international conventions apply uniformly. Where particular provisions bear more directly on one facility than the other for example, odor and discharge standards for the SCSTP, or reuse licensing and groundwater protection zoning for the SCWRRF, these specifics are identified in the relevant subsections. This integrated approach ensures that compliance obligations are presented as a single framework, while still highlighting facility-specific requirements where they materially affect the assessment or management measures.

4.1. Applicable National Legislation

Four pieces of legislation carry particular relevance to these facilities.

The Ramsar Convention on Wetlands applies through the designation of Graeme Hall Swamp as Ramsar Site No. 1591[19]. The emergency bypass discharges into that designated site[20], so the obligation to maintain ecological character is engaged directly by the discharge pathway assessed at EI-02.

The Marine Pollution Control Act governs discharge to coastal waters, engaged by the existing ocean outfall and by the hydrological connection through the sluice gate.

The Health Services Act, Chapter 44, governs sanitation and nuisance, engaged by the odor pathway at EI-03 and by any discharge reaching areas used by the public.

[19] Ramsar Convention on Wetlands, List of Wetlands of International Importance, Graeme Hall Swamp, Site No. 1591. (Ramsar Convention on Wetlands, n.d.)

[20] Ramsar Convention on Wetlands, List of Wetlands of International Importance, Graeme Hall Swamp, Site No. 1591. (Ramsar Convention on Wetlands, n.d.)

Performance Standard 6 applies with Critical Habitat requirements engaged, since the receiving water for the bypass is confirmed Critical Habitat.

Table 18 presents the applicable national legislation.

Table 18: Applicable national legislation

Instrument	Relevance
Barbados Water Authority Act	Water resource management, and the Authority's role as executing agency
Child Protection Act, 2024	Child protection obligations
Data Protection Act, 2019-29	Personal information in grievances, engagement records and monitoring
Employment Rights Act, 2012	Employment terms and disciplinary process
Employment Sexual Harassment (Prevention) Act, 2017	Employer obligation to issue a written policy and complaint procedure
Employment (Prevention of Discrimination) Act, 2020	Non-discrimination in employment, including through subcontractors
Environmental Protection Department requirements	Air, noise, effluent and waste standards
Health Services (Collection and Disposal of Refuse) Regulations	Waste definitions, storage and disposal
Health Services Act, Chapter 44	Public health and nuisance, material to odor and to any discharge reaching areas of public access
Marine Pollution Control Act	Discharge to coastal waters
National Biodiversity Strategy and Action Plan, 2020	National biodiversity policy, identifies mosquito and rat control needs at Graeme Hall
National Noise Policy	Environmental noise, adopting the World Health Organization Community Noise Guidelines as reference standards
Planning and Development (Environmental Impact Assessment) Regulations, 2021	Governs the national environmental impact assessment process and the approval pathway
Prevention of Floods Act	Drainage and standing water
Ramsar Convention, as applied to Site No. 1591	International designation underpinning the Critical Habitat determination
Rights of Persons with Disabilities Bill, 2025	Accessibility and non-discrimination, subject to enactment
Road Traffic Act and Regulations	Vehicle movement, speed and noise-making devices
Safety and Health at Work Act, Chapter 356	Occupational duties, with community consequence at the

Instrument	Relevance
	interface
Sexual Offenses Act, Chapter 154	Criminal framework relevant to the SEA, SH and GBV commitments
Town and Country Planning Act	Development permission for the facility
Underground Water Control Act	Aquifer protection, material to the recharge component
Barbados Strategic Plan for Health, 2002	Direction for public health sector development, relevant to community health and safety
Constitution of Barbados, Chapter III (sections 11 to 26)	Fundamental rights and freedoms, including equality and dignity before the law; the foundation for the non-discrimination and gender commitments
Domestic Violence legislation (1993, as cited)	Protection orders in circumstances of domestic violence; relevant to the GBV response and referral pathway
Employment (Miscellaneous Provisions) Act, 2005	General employment provisions, including young persons and children
Employment of Women (Maternity Leave) Act, Chapter 345A	Maternity leave entitlement and protection of employment during leave
Holidays with Pay Act, Chapter 348	Paid holiday entitlement for employees
Labor Clauses (Public Contracts) Act, Chapter 349	Working conditions, wages and limits on contractors and subcontractors in public contracts
Minimum Wage Act, 2017, and Minimum Wage (National and Sectoral Minimum Wage) Order, 2021	National and sectoral minimum wage, employer record-keeping and notice duties
National Employment Policy of Barbados, 2014	Access to full, productive and freely chosen employment
National Strategic Plan for the Prevention and Control of Non-Communicable Diseases, 2020 to 2025	Public health priorities relevant to the community health baseline
National Strategic Plan of Barbados, 2006 to 2025	Multi-sector national development policy covering social risk management
Protection of Wages Act, Chapter 351	Payment of wages in legal tender
Public Holidays Act, Chapter 352	Public holiday entitlements
Trade Unions Act, Chapter 361	Workers' rights to organize and protection against coercion for union participation

The regulatory standard governing reclaimed water quality for aquifer recharge and for agricultural reuse remains to be confirmed with the Environmental Protection Department and the Barbados Water

Authority. Until it is, the assessment at PRJ-EI-09 applies World Health Organization guidance on the safe use of wastewater in agriculture as the interim reference.[21] This determines the operational criteria assessed at PRJ-EI-09.

4.1.1. Labor, Employment and Gender Legislation

Labor, Employment and Gender Legislation

The Program will have direct and indirect workers on site, and communities and foot traffic lie within the area of influence. The labor, employment, health and gender instruments therefore activate ESPS 1, 2, 4 and 9, and in some cases the whole performance framework. Table 19a maps each instrument to the performance standard it activates and to the unit responsible for demonstrating compliance, with the evidence that unit holds.

Table 19a: Labor, employment, health and gender legislation, ESPS activated and responsible unit

Instrument	Key provision	ESPS	Responsible unit and evidence
Constitution of Barbados, Chapter III	Fundamental rights and equality before the law	ESPS 1, 2, 4, 9	Social Department; Social Management Plan; Code of Conduct; Environmental Management Plan; Labor Influx Plan; Employee Contract
Employment of Women (Maternity Leave) Act, Ch. 345A	Maternity leave and protection of employment	ESPS 2, 9	Human Resource Department; Employment Contract; Sexual Harassment Policy; Workers' Code of Conduct
Holidays with Pay Act, Ch. 348	Holiday entitlement after one year of employment	ESPS 2	Human Resource Department; Employment Contract
Labor Clauses (Public Contracts) Act, Ch. 349	Notices of working conditions, wages and limits on contractors and subcontractors	ESPS 2	Human Resource Department; Procurement Department; Employment Contract; Supplier and Procurement Contracts
Protection of Wages Act, Ch.	Wages payable in legal tender	ESPS 2	Human Resource Department; Employment Contract; Health and Safety Management

[21] World Health Organization, Guidelines for the Safe Use of Wastewater, Excreta and Greywater in Agriculture and Aquaculture, Volume 2, health-based targets and the multiple barrier approach comprising treatment, crop restriction, irrigation method, withholding periods and hygiene practice. (World Health Organization, 2006)

Instrument	Key provision	ESPS	Responsible unit and evidence
351			Plan; Social Management Plan
Public Holidays Act, Ch. 352	Public holiday entitlements	ESPS 2	Human Resource Department; Employment Contract
Safety and Health at Work Act, Ch. 356	Health, safety and welfare at work; fire certificate issued by the Chief Fire Officer	ESPS 2	Health and Safety Officer; Health and Safety Management Plan; Environmental Management Plan
Sexual Offences Act, Ch. 154	Sexual crimes, including offences against persons under 16	ESPS 9	Human Resource Department; Employment Contract; Sexual Harassment Policy; SGBV Policy; Workers' Code of Conduct; Grievance Redress Mechanism
Trade Unions Act, Ch. 361	Right to organize; offences of coercion or prejudice against union participation	ESPS 2	Human Resource Department; Employment Contract; Workers' Rights Policy; Trade Union or Collective Bargaining Agreement
National Employment Policy, 2014	Full, productive and freely chosen employment	ESPS 2	Human Resource Department; Employment Contract; Workers' Rights Policy; Trade Union or Collective Bargaining Agreement
Employment (Miscellaneous Provisions) Act, 2005	General employment provisions, including young persons and children	ESPS 2	Human Resource Department; Employment Contract; Workers' Rights Policy; Trade Union or Collective Bargaining Agreement
Minimum Wage Act, 2017, and Order, 2021	National and sectoral minimum wage; employer records and notice	ESPS 2	Employment Contract; Workers' Rights Policy; Trade Union or Collective Bargaining Agreement
Employment Rights Act, 2012	Written particulars, itemized pay, notice, unfair dismissal, Employment Rights Tribunal	ESPS 2	Human Resource Department; Employment Contract; Workers' Rights Policy; Trade Union or Collective Bargaining Agreement
Employment Sexual Harassment (Prevention) Act, 2017	Definition of sexual harassment; employer duty to adopt and post a policy with penalties	ESPS 2, 9	Human Resource Department; Employment Contract; Sexual Harassment Policy; SGBV Policy; Workers' Code of Conduct; Grievance Redress Mechanism
Employment (Prevention of	Protection from discrimination in	ESPS 2, 9 [ESPS 9	[Not stated in source document, to be

Instrument	Key provision	ESPS	Responsible unit and evidence
Discrimination) Act, 2020	employment	added; source lists ESPS 2 only]	completed]
Health Services Act, 1969 (Cap. 44)	Public health, sanitation, overcrowding and nuisance	ESPS 4	Health and Safety Officer; Health and Safety Management Plan; Environmental Management Plan
Barbados Strategic Plan for Health, 2002	Public health sector direction	ESPS 4	Health and Safety Officer; Health and Safety Management Plan; Environmental Management Plan
National Strategic Plan for NCDs, 2020 to 2025	Eight priority areas for NCD prevention and control	ESPS 4	Health and Safety Officer; Health and Safety Management Plan; Environmental Management Plan
National Strategic Plan of Barbados, 2006 to 2025	Multi-sector national development policy	ESPS 1 to 10	Social Department; Health and Safety Department; Project Execution Unit; Social Management Plan; Workers' Code of Conduct; Environmental Management Plan; Labor Influx Plan; Employee Contract; Waste Management Plan
Planning and Development (EIA) Regulations, 2021	Public participation and content of the environmental impact statement	ESPS 1 to 10	Social Department; Administrative Department; Project Engineer; Execution Department; Social, Environmental, Stakeholder Engagement, Labor, Waste and Traffic Management Plans; Grievance Mechanism

The Employment Sexual Harassment (Prevention) Act and the Employment (Prevention of Discrimination) Act are the two instruments on which the workforce commitments rest most directly. Subcontractors are bound by the Workers' Code of Conduct and by the non-discrimination requirements of the 2020 Act, and the Contractor sets gender provisions in subcontract terms. The way these instruments are applied to the workforce is assessed in the Social Impact Assessment and in the gender monitoring matrix.

4.1.2. Noise Standards and the National Framework

Barbados has no dedicated noise legislation. Noise is otherwise addressed through the nuisance provisions of the Health Services Act, the Marine Pollution Control Act and the Road Traffic Regulations. The Project adopts the guideline values contractually so that they bind irrespective of enforceability at

national level, applying 55 dB(A) as the daytime threshold for serious annoyance, 50 dB(A) for moderate annoyance, and 45 dB(A) as the night-time guideline outside bedrooms.

The National Environmental Noise Perception and Social Survey (NENPASS) supplies the national evidence base on how communities experience environmental noise. It establishes that community response is governed by more than measured level, with perceived intrusiveness, source character, time of day, predictability and community attitude toward the source all shaping the response.

That finding carries specific weight for this facility. The existing plant is an existing operational source that residents already associate with odor and nuisance, and additional and new construction on an operating sewage works is an activity toward which the receiving community is unlikely to be neutral. Noise from this facility is therefore assessed as more intrusive at a given level than the same level from a source the community regards as benign. The NENPASS evidence also supports assessing night-time exposure separately, since sleep disturbance operates at levels below those causing daytime annoyance, and Location 2 within the plant compound already records the most significant existing noise source at an average of 63.8 dB(A).

4.2. Inter-American Development Bank Performance Standards

The Inter-American Development Bank's Environmental and Social Performance Framework (ESPF) governs and provides overall guidance to the ESIA and ESMP approach in this document. The ESPF consists of ten (10) standards (see Figure 26)



Figure 27: Overview of IDB's ESPS

Of the 10 ESPS, eight apply to this Assessment. ESPS 5 is deemed not relevant due to the fact that no land acquisition is required for the upgrade to the current plant and likewise ESPS 7 is also not relevant due to the fact that Barbados has no indigenous groups or peoples. All of the other ESPS apply (see Table 19). ESPS 6 is particularly relevant due to the emergency bypass discharges into confirmed Critical

Habitat areas and given that the existing conveyance lies within it. ESPS 3 also carries weight given the effluent and sludge streams while ESPS 4 carries particular weight given the odor pathway to residential receptors at approximately 250 meters as well as operational interface hazards.

Relevant also to ESPS 1 is that the pipeline route appears not to be fully confirmed and this has implications for air quality and noise impact assessments. Also relevant to ESPS 1 as well as Pollution Prevention (ESPS 3) is that the SCSTP and BSTP (Bridgetown Sewage Treatment Plant) both have marine discharge points in proximity.

Table 19: IDB Environmental and Social Performance Standards triggered

Standard	Basis
ESPS 1, Assessment and Management of Environmental and Social Risks and Impacts	Governs the assessment process, the mitigation hierarchy and the management system
ESPS 2, Labor and Working Conditions	Construction workforce, subcontracted labor, worker grievances
ESPS 3, Resource Efficiency and Pollution Prevention	Emissions, effluent, waste, hazardous materials, energy and water use
ESPS 4, Community Health, Safety and Security	Traffic, dust, noise, emergency events, security arrangements
ESPS 6, Biodiversity Conservation and Sustainable Management of Living Natural Resources	Confirmed Critical Habitat, the governing standard for the biodiversity assessment
ESPS 8, Cultural Heritage	Excavation is proposed, triggering the chance find requirement
ESPS 9, Gender Equality	Differentiated effects, SEA, SH and GBV, workforce composition
ESPS 10, Stakeholder Engagement and Information Disclosure	Engagement, disclosure and grievance access

ESPS 5 on land acquisition and resettlement and ESPS 7 on Indigenous Peoples are screened and not triggered. Land tenure along the transfer and reuse pipeline corridor remains to be established, and the ESPS 5 screening cannot be closed until it is.

4.2.1. Critical Habitat Requirements Under ESPS 6

Because Critical Habitat is confirmed, the Project must demonstrate that it will not result in measurable adverse impact on the criteria for which the habitat was designated, no net reduction in the population of any Critically Endangered, Endangered or restricted-range species, and no significant conversion or degradation of the habitat.

4.2.2. Prohibition on Asbestos

Asbestos-containing materials are prohibited on this Project. The prohibition follows from the Inter-American Development Bank Environmental and Social Policy Framework, under which asbestos-containing materials are not permitted in Bank-funded projects. It applies to both facilities, to all

contractors and subcontractors, and to every stage from procurement through construction, operation and maintenance.[22]

No asbestos-containing material may be specified, procured, delivered to site or installed. This applies to roofing sheets, cladding, pipework, gaskets, insulation, jointing compounds, brake and clutch components, and any other product in which asbestos may be present. Where a material specification is silent on asbestos content, the Contractor obtains written confirmation from the supplier that the product is asbestos free before procurement proceeds.

Where asbestos-containing material is suspected or found in existing structures during the upgrade of the existing plant, work stops immediately in the affected area. The material is not disturbed, cut, drilled, broken or removed by construction personnel. The area is secured and the Project Execution Unit is notified. Identification and any subsequent removal are undertaken only by personnel competent in asbestos handling, under a method statement approved in advance, with removal, transport and disposal through an authorized route and with air monitoring during the works. Records of identification, handling and disposal are retained for the life of the Project.

Any reference in Project documentation to asbestos-cement or asbestos-containing components in existing infrastructure is read as a record of what may be encountered and not as authorization to install, reuse or retain such material. Where existing asbestos-containing material is identified and can be left undisturbed without risk, that decision is recorded with the reasons; in every other case the material is removed under the arrangements above.

Workforce induction covers the prohibition, the recognition of materials that may contain asbestos, and the obligation to stop work and report. Compliance is verified through procurement records, delivery inspection and the monthly report to the Project Execution Unit.

4.3. International Frameworks

Barbados is party to multilateral agreements that bear directly on a sewage treatment works discharging to the marine environment adjacent to a Ramsar wetland. The instruments carrying particular weight for these facilities are set out below.

The Cartagena Convention and the Land-Based Sources Protocol

Barbados ratified the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region and its Oil Spills Protocol in May 1985, endorsed the Specially Protected Areas and Wildlife Protocol in October 2002, and acceded to the Protocol Concerning Pollution from Land-Based Sources and Activities on 29 June 2019[23],[24].

[22] Inter-American Development Bank, Environmental and Social Policy Framework, Environmental and Social Performance Standards 1 to 10, with Performance Standard 6 on Biodiversity Conservation and Sustainable Management of Living Natural Resources. (Inter-American Development Bank, n.d.)

[23] Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region (Cartagena Convention), 1983, and the Protocol Concerning Pollution from Land-Based Sources and Activities, Annex III, effluent limitations for domestic wastewater discharged to the marine environment. (Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region, 1983)

[24] World Bank Group, General Environmental, Health and Safety Guidelines, sections 1 and 3, together with the Environmental, Health and Safety Guidelines for Water and Sanitation, sections on plant operation, odor and bioaerosol management and sludge handling. (World Bank

The Land-Based Sources Protocol is the most directly engaged instrument by this facility. It governs pollution reaching the marine environment from land, and Annex III establishes effluent limitations for domestic wastewater discharged to the marine environment, covering biochemical oxygen demand, total suspended solids, pH, fats, oils and grease, floatables and fecal coliforms, with limits differing according to the sensitivity of the receiving waters.

The effluent quality recorded at Section 4.2.1 bears directly on that obligation. Suspended solids leaving the plant at 142 mg/L, biochemical oxygen demand at 205 mg/L, and fecal coliforms and enterococci exceeding safe limits by orders of magnitude describe a discharge that does not meet the Annex III standard for domestic wastewater. The upgrade is the mechanism by which compliance is achieved, and this assessment records the pre-upgrade position as the baseline against which that improvement is measured.

The Specially Protected Areas and Wildlife Protocol requires Parties to protect rare or fragile ecosystems and the habitat of depleted, threatened or endangered species. The emergency bypass discharges into habitat of that character. The Oil Spills Protocol applies to the fuel and chemical storage arrangements on site.

The Ramsar Convention on Wetlands

Graeme Hall Swamp is designated Ramsar Site No. 1591[25]. Article 3.2 of the Convention requires Barbados to inform the Ramsar Secretariat at the earliest possible time if the ecological character of a listed site has changed, is changing or is likely to change as a result of technological developments, pollution or other human interference.

That duty is engaged by the emergency bypass. A discharge of untreated sewage into the Bisecting Canal is pollution reaching a listed site, and a discharge of the scale recorded in 2005 would be capable of changing its ecological character. The bypass arrangements at Section 7.2 and the notification protocol at Section 7.7 are directed at preventing that outcome and, should it occur, at ensuring the Government of Barbados is placed in a position to discharge its reporting obligation.

Convention on Biological Diversity and Climate Instruments

The National Biodiversity Strategy and Action Plan of 2020[26] identifies wetland and mangrove ecosystems as conservation priorities and identifies the need for mosquito and rat control in Graeme Hall Swamp specifically, which connects the Convention obligations to the vector pathway at EI-10.[27]

Group, 2007; World Bank Group, 2007)

[25] Barbados Statistical Service, 2021 Population and Housing Census, enumeration area data for Graeme Hall, St. Lawrence, Worthing and Rendezvous. (Barbados Statistical Service, n.d.)

[26] Barbados Statistical Service, 2021 Population and Housing Census, enumeration area data for Graeme Hall, St. Lawrence, Worthing and Rendezvous. (Barbados Statistical Service, n.d.)

[27] Government of Barbados, National Biodiversity Strategy and Action Plan, 2020, priority actions on wetland and mangrove ecosystems and on mosquito and rat control at Graeme Hall Swamp. (Government of Barbados, 2020)

Barbados is a Party to the United Nations Framework Convention on Climate Change and the Paris Agreement. The upgrade carries an energy demand that bears on the national mitigation commitment and on the non-carbon emissions agreement stipulated in the Contract.

4.3.1. Human Rights and Regional Instruments

Barbados has ratified the Convention on the Elimination of All Forms of Discrimination Against Women, the Convention on the Rights of the Child, and the Convention on the Rights of Persons with Disabilities. Each bears on the social and gender assessment and on the engagement arrangements.

The obligations under the Convention on the Elimination of All Forms of Discrimination Against Women (known as CEDAW) are engaged by the presence of a predominantly male non-local construction workforce adjacent to an established residential community, and by the differentiated exposure of women and girls recorded in the social baseline. The Convention on the Rights of Persons with Disabilities is engaged by the accessibility arrangements for consultation and for the grievance mechanism, and by the identification of persons with disabilities as a vulnerable group. The Convention on the Rights of the Child is engaged by the proximity of two schools to the construction access route and by the child protection provisions of the Grievance Redress Mechanism.

Barbados has ratified the eight fundamental Conventions of the International Labour Organization, covering freedom of association and collective bargaining, the elimination of forced labor, the abolition of child labor and the elimination of discrimination in employment. These are given effect through the Labor Management Plan and the Code of Conduct and are assessed under Performance Standard 2.

Barbados is a member of the Caribbean Community, and the Revised Treaty of Chaguaramas provides for cooperation on environmental protection and for the free movement of skills, the latter bearing on the composition of the construction workforce. The Caribbean Public Health Agency, CARPHA, provides regional public health coordination relevant to the communicable disease and vector pathways.

Barbados is also a Small Island Developing State and participates in the framework established through the Barbados Programme of Action of 1994, the Mauritius Strategy and the SAMOA Pathway, each of which addresses freshwater resources, coastal and marine resources and waste management as priority areas. Species listed under the Convention on International Trade in Endangered Species are addressed in the Priority Species Screening Matrix, and the Project does not involve trade in listed species.

4.3.2. Gender, Labor and Human Rights Instruments

Gender, Labor and Human Rights Instruments

Barbados has signed, adopted or ratified the instruments in Table 19b, and by those undertakings is obliged to act. CEDAW is elaborated through General Recommendations. Two bear directly on the Program: General Recommendation 37, on the gender-related dimensions of disaster risk reduction in the context of climate change, which is relevant to a project justified on climate resilience grounds, and General Recommendation 38, on trafficking in women and girls in the context of global migration, which is relevant to the management of a non-local workforce. The Beijing Platform for Action sets out 12 critical areas of concern, including violence, the economy, power and decision-making, and the environment, which frame the national gender policy.

Table 19b: International instruments relevant to gender equality and labor

Instrument	Purpose	Status (as stated in source)	Country response
CEDAW (1979)	Legally binding standards to eliminate discrimination against women and ensure equal rights in political, economic and social life	Ratified 24 July 1980	[Not stated in source document, to be completed][28]
Belem do Para Convention (1994)	Establishes the right of women to a life free from violence; binds states to criminalize and eliminate gender-based physical, sexual and psychological harm	"Adopted on May 16, 1995"	Enactment of the Domestic Violence protection orders legislatTion
ILO Convention C190	Right of everyone to a world of work free from violence and harassment, including gender-based violence	"Adopted 01 September 2022"	Enactment of the Employment (Prevention of Discrimination) Act
ILO Convention C111, Discrimination (Employment and Occupation), 1958	Equality of opportunity and treatment in employment and occupation	"Adopted 14 October 1974"	[Not stated in source document, to be completed]
ILO Convention C029, Forced Labour, 1930	Suppression of forced or compulsory labor in all its forms	Ratified by Barbados (fundamental convention); date to be confirmed against ILO NORMLEX	Prohibition of forced labor in the Code of Conduct and LMP; no retention of identity documents; free recruitment
ILO Convention C105, Abolition of Forced Labour,	Prohibits forced labor as a means of coercion, discipline or punishment	Ratified by Barbados (fundamental convention); date to be confirmed against ILO NORMLEX	Code of Conduct and LMP disciplinary procedures exclude any form of forced labor as a

[28] This relates to the content of publicly available reports where information may be incomplete for the purposes needed for an ESIA.

Instrument	Purpose	Status (as stated in source)	Country response
1957			sanction
ILO Convention C100, Equal Remuneration, 1951	Equal remuneration for men and women workers for work of equal value	Ratified by Barbados (fundamental convention); date to be confirmed against ILO NORMLEX	Pay by grade benchmarked against national data and applied equally to women and men (LMP 8.4.7.4); pay data monitored by sex
ILO Convention C182, Worst Forms of Child Labour, 1999	Prohibition and elimination of the worst forms of child labor, including hazardous work by persons under 18	Ratified by Barbados (fundamental convention); date to be confirmed against ILO NORMLEX	Minimum age of 18 for hazardous work and age verification with a Register of Young Persons (LMP); child protection provisions of the Code of Conduct
Beijing Platform for Action (1995)	Roadmap for women's rights and empowerment across 12 critical areas of concern	Signed and adopted September 1995	[Not stated in source document, to be completed]

4.4. Enabling Environment and Implications for Compliance

The national framework addresses environmental assessment, water resources, public health, occupational safety, labor, data protection and biodiversity policy, with institutional responsibility assigned to identifiable agencies.

Three characteristics shape how compliance is achieved in this facility.

Coverage is distributed across instruments. Compliance is demonstrated through project level instruments that draw the requirements together.

Certain standards rest on policy and not on statute. Environmental noise is the clearest example. Where a standard rests on policy, the Project adopts it contractually so that it binds irrespective of enforceability at national level.

Enforcement capacity is subject to concurrent demand across the Environmental Protection Department, the Barbados Water Authority and the Coastal Zone Management Unit. The management arrangements therefore rely on Contractor delivered monitoring, supervision and corrective action, with regulatory engagement structured as coordination.

4.5. SCSTP-Specific Legislative and Institutional Considerations

Four instruments carry particular relevance to this facility.

The regulatory and safeguard framework governing the Project engages multiple instruments. The Ramsar Convention on Wetlands applies through the designation of Graeme Hall Swamp as Ramsar Site No. 1591, with obligations to maintain ecological character directly engaged by the emergency bypass pathway (STP-EI-02). The Marine Pollution Control Act governs discharges to coastal waters, relevant to both the existing ocean outfall and the hydrological connection through the sluice gate. The Health Services Act, Chapter 44 addresses sanitation and nuisance, engaged by odor emissions (STP-EI-03) and by any discharge reaching areas used by the public. Finally, Performance Standard 6 applies with Critical Habitat requirements engaged, since the receiving waters for the bypass are confirmed Critical Habitat.

Table 20 outlines the relevant legislative and policy instruments with more detail of how these are being considered in the context of the assessment.

Table 20: Instruments of particular relevance to the SCSTP component

Instrument	Relevance
Marine Pollution Control Act	Governs discharge to coastal waters, material to the existing outfall and to any discharge during construction
Environmental Protection Department effluent standards	Sets the discharge quality criteria applying during and after the upgrade
Health Services Act, Chapter 44	Public health and nuisance, material to odor and to any discharge reaching areas of public access
Barbados Water Authority Act	The Authority's role as operator and executing agency
Ramsar Convention, Site No. 1591	Underpins the Critical Habitat determination for the receiving waters of the emergency bypass
Underground Water Control Act	Aquifer protection
Planning and Development (Environmental Impact Assessment) Regulations, 2021	The national assessment and approval pathway

The discharge consent conditions currently applying to the plant, and whether the upgrade alters them, remain to be confirmed with the Environmental Protection Department.

5. Assessment Methodology

This section records how the assessment was carried out, so that any finding in this document can be traced to the evidence and the reasoning behind it. It covers the principles governing the work, the evidence base and how it was tested, the basis on which four previously separate assessments were consolidated into this document, the impact rating method and the derivation of significance from likelihood and magnitude, the additional test applied where Critical Habitat is engaged, and the quality assurance arrangements.

The methodology is applied without variation across the two facilities and the workers' camp, and across environmental, social and gender pathways. That consistency is deliberate: it is what allows the ratings in this document to be compared with one another, with the Critical Habitat Impact and Significance Matrix, and with the other Project instruments.

5.1. Approach and Guiding Principles

The assessment applies the methodology agreed for the upgrade and reclamation facility assessments. Six principles govern:

- Compliance traceability. Each requirement of the Inter-American Development Bank Performance Standards and of the Barbados environmental impact assessment process is traced to the section of this document that responds to it, through the Environmental and Social Commitments Register at Annex H.
- Proportionality. Assessment effort and control intensity are calibrated to assessed risk, with the highest effort directed at Critical Habitat pathways, road safety and the reclaimed water pathway.
- Integration. The assessment is developed alongside the plant upgrade assessment, the Labor Management Plan, the CoC, the Community Health Assessment and the stakeholder engagement record, so that commitments are consistent across instruments.
- Inclusion. Differentiated effects on vulnerable groups are assessed explicitly, and engagement arrangements are designed so those groups can participate meaningfully.
- Practicality. Commitments are written for use by Contractor supervisors and subcontractors, with a named responsible role, a frequency and a verification method for every measure.
- Adaptive management. Monitoring results, grievances and incidents drive revision of controls through the corrective action process.

5.2. Evidence Base

The assessment begins from the existing evidence base. The Contractor's soil, air, water and noise sampling, laboratory results, design information, construction assumptions and site knowledge are treated as primary inputs, subject to review for date, location, parameter coverage, quality, representativeness and relevance to this facility. Prefeasibility studies prepared previously are used to retain continuity in the Project narrative, the Area of Influence, the risk issues and the baseline interpretation.

Where the existing evidence is sufficient, this assessment cites and interprets it. Where limitations remain, the assessment applies professional judgment, targeted verification, new sampling, or an implementation stage monitoring commitment, and states which applies at the point the issue arises.

5.2.1. Consolidation of Source Assessments

This document consolidates material previously held in separate assessments, and the basis of that consolidation is recorded here so that a reader can trace any finding to its source. Four bodies of work

are combined. The first is the integrated assessment of the plant upgrade, the reclamation facility and the workers' camp, which forms the body of this document.

The Rapid Critical Habitat Assessment supplies the Critical Habitat determination, the Key Biodiversity Features, the priority species screening, the August 2026 field verification, and the Critical Habitat Impact and Significance Matrix. The Gender and Social Assessment supplies the workforce composition analysis, the occupational segregation findings and the gender-differentiated impact pathways. The Environmental and Social baseline Studies and laboratory results commissioned for the two facilities supply the April 2026 water, air and noise data.

Consolidation follows three rules. A dataset is recorded once, in the chapter where it is first used, and cross-referenced thereafter rather than reproduced, so that a figure cannot diverge between chapters through separate editing. Where the same pathway acts on both facilities, it is assessed once at the level at which it operates and cross-referenced from the other chapter, which is why traffic and road safety is rated once for the shared access route and why the wetland conveyance decision is recorded as a single determination at PRJ-EI-11 and PRJ-EI-14. Where two source documents record different figures for the same quantity, both are stated with their source, and the difference is explained rather than reconciled silently; the earlier local content figures of 61.1 and 58.3 percent were treated in this way. Two figures have since been settled: the resident camp population is assessed at 120, as agreed with the Project Execution Unit, which with the total of 252 gives 132 local posts and local content of 52.4 percent; and the number of women is 21, the figure in the Contractor's Labor Management Plan, of whom 20 are employed through local subcontractors and one is a Chinese national in project management.

Two limitations of the consolidation should be read alongside the findings. The baseline data are drawn from a monitoring campaign designed around the workers' camp, so coverage is strongest at the camp and plant interface and thinner at the margins of the reclamation facility footprint. And all field data fall within the dry season, so the assessment of wet-season pathways, principally runoff, standing water and bypass activation, rests on professional judgment and on the physical characterization of the site rather than on measured wet-season conditions.

5.3. Impact Assessment Methodology

Impacts are rated using the methodology required by the Project Execution Unit and applied across all Project environmental and social documentation, so that findings are comparable between instruments.

Extent: on-site, local, regional, national, or transboundary and international.

Duration: temporary, short-term, long-term, or permanent.

Likelihood or probability (Table 21):

Table 21: Likelihood scale

Score	Descriptor
1	Rare or highly unlikely
2	Unlikely

Score	Descriptor
3	Possible
4	Likely
5	Highly likely or almost certain

Magnitude, considered in terms of receptor sensitivity (see Table 22):

Table 22: Magnitude scale, considered in terms of receptor sensitivity

Score	Descriptor	Interpretation
1	Negligible	No measurable change in receptor condition or function
2	Low	Transient or localized change, no lasting effect
3	Moderate	Measurable change requiring management, recoverable
4	High	Serious change, sustained effect, recovery uncertain or prolonged
5	Catastrophic	Irreversible loss of receptor function, fatality, or permanent conversion

Magnitude answers one question: how badly would the receptor be affected if this happened. A score of 1 or 2 means the receptor absorbs the change without lasting effect. A 3 means the change is noticeable but recovers. A 4 means the receptor cannot absorb it without intervention. A 5 is reserved for harm that cannot be undone. In this assessment four things score 5: a fatality, whether on the road or in lifting operations, serious harm from sexual exploitation or abuse, an uncontrolled release reaching the Ramsar wetland, and off-specification recharge water reaching the karst aquifer.

Risk significance is derived from likelihood and magnitude and expressed as Low, Medium, High, Very High or Critical, consistent with the risk level interpretation required by the IDB.

Significance is the product of the likelihood and magnitude scores, following the Risk Assessment Matrix that the Project Execution Unit reviewed for the Workers' Camp assessment. A score of 1 to 4 is Low, 5 to 9 Medium, 10 to 14 High, 15 to 19 Very High and 20 to 25 Critical. The matrix reviewed for the Workers' Camp carried inconsistent labels for scores of 15 and 16, so the five bands stated here are applied to every pathway. Table 23 sets out the score and rating for every combination, so that a reader can reproduce any rating in this assessment. The likelihood and magnitude scores are reported beside every rating.

Professional judgment is applied to one class of pathway. A product treats a rare catastrophic event and a frequent minor one alike, so a pathway with a catastrophic magnitude (5) is designated a priority pathway and is managed at the highest priority whatever its score. Two reasons support the rule. For releases that could reach the Graeme Hall wetland, ESPS 6 requires that the Project does not lead to measurable adverse impacts on the biodiversity values for which the Critical Habitat was designated

(paragraph 17). The standard sets an outcome and, in the reading applied in this assessment, a low likelihood score is not sufficient on its own to show that the condition is met. For harm to people, including a fatality or sexual exploitation and abuse, the consequence cannot be reversed.

Priority pathways are marked (Priority) in the summary tables. Their rating still follows the matrix, but a lower residual rating does not relax any control: the gate conditions in Section 7.12, the named verifiers and the monitoring in Section 8.5 apply in full. A residual position that leaves open a measurable adverse impact on the wetland is not acceptable and requires the design or method to be revised.

Table 23: Derivation of significance from likelihood and magnitude

Magnitude	Likelihood 1	Likelihood 2	Likelihood 3	Likelihood 4	Likelihood 5
5, Catastrophic	5, Medium	10, High	15, Very High	20, Critical	25, Critical
4, High	4, Low	8, Medium	12, High	16, Very High	20, Critical
3, Moderate	3, Low	6, Medium	9, Medium	12, High	15, Very High
2, Low	2, Low	4, Low	6, Medium	8, Medium	10, High
1, Negligible	1, Low	2, Low	3, Low	4, Low	5, Medium

Three conventions apply to the reading of the impact tables. Where a score is expressed as a range, such as a magnitude of 2 to 3, the significance is expressed as the corresponding range, and the higher value governs any management decision taken on it. Where an impact is beneficial, the same scoring is applied, and the significance is recorded as positive; a positive rating of Very High denotes a substantial benefit and not a substantial risk. Beneficial significance is expressed on the levels Low to Very High, so a beneficial product of 20 or more is recorded as Very High, positive. And a residual likelihood is not reduced below the point at which the activity itself remains certain: where an impact arises from an activity that will occur, such as vegetation clearance within an approved footprint, mitigation acts on magnitude rather than on likelihood, and the residual rating reflects that.

Post-mitigation ratings assume that the stated measures are implemented in full and verified through the monitoring program. They are not a forecast of what will occur in the absence of that verification, and where monitoring demonstrates that a measure is not performing, the residual rating is not the applicable one, and the corrective action process applies.

Each impact is assessed twice, before and after mitigation. Impact tables record activity, potential impact, risk, nature and type of impact, extent, duration, likelihood, magnitude, pre-mitigation significance, summary of mitigation measures with cross-reference to the Environmental and Social Management Plan, post-mitigation likelihood and magnitude, residual significance, and management measures addressing residual impacts.

5.4. Critical Habitat Assessment Methodology

Because Critical Habitat is confirmed, each Project pressure acting on a Key Biodiversity Feature is additionally assessed against the significant conversion or degradation test. That test asks whether the effect is of sufficient magnitude, extent, duration or irreversibility to materially reduce the integrity,

ecological character or biodiversity support function of the Critical Habitat, or to substantially compromise the Key Biodiversity Features and ecological processes for which it is important.

The assessment distinguishes the presence of an impact pathway from an effect capable of causing significant conversion or degradation. The presence of a pathway does not of itself establish significance.

5.5. Quality Assurance

Each deliverable is checked for technical completeness, internal consistency, compliance traceability, evidence quality, implementability and responsiveness to comments. Review comments from the Contractor, the Barbados Water Authority, the Inter-American Development Bank and stakeholders are tracked in the comment and response matrix at Annex K, recording for each comment whether the document was revised, the location of the revision, and any remaining assumption or implementation stage action.

5.6. Assessment Preparation Team

This assessment was prepared by SAEDI Consulting (Barbados) Inc. The team combines environmental assessment, ecology, social and gender assessment, GBV/SEAH, community health, GIS and engineering review disciplines.

Ecological field verification was carried out on 21, 24 and 28 August 2026 by Tracy Phillips, Gregory Franklin and Katherine Blackman. Ambient noise monitoring was carried out on 15 to 17 April 2026 by M. Franklin-Lynch of BrinsJen Systems Development Specialists using REED R8080 Type 2 sound level meters, serial numbers 220106871 and 230604542, with factory calibration dated 2 September 2025 and field calibration on 13 April 2026.

The April 2026 field data come from three separate activities undertaken by BrinsJen Systems Development Specialists in the same week: ambient noise monitoring at eight locations (15 to 17 April), the flora and fauna survey of the Workers' Camp site and environs (14 to 18 April), and the socio-economic field exercise in Harmony Hall and the surrounding community (15 to 18 April). The differing dates reflect the duration of each activity rather than inconsistency in the record.

5.7. Information Gaps and Assumptions

Gaps fall into three classes. Design gaps concern information held by the Contractor that is not yet issued. Baseline gaps concern environmental or social measurement not yet undertaken. Institutional gaps concern decisions or confirmations held by the Barbados Water Authority, the Project Execution Unit or a regulator. Each is listed with the party able to close it.

5.7.1. Design Information

The Contractor issued design information for both facilities on 12 September 2026, which closed the majority of the design gaps previously recorded. The items below remain open. The table states the assumption applied in the interim and the effect on the assessment if the assumption proves wrong.

Table 24 presents the outstanding design information, assumptions applied and effect on the assessment.

Table 24: Outstanding design information, assumptions applied and effect on the assessment

Item	Assumption applied	Effect if the assumption is wrong	Held by
Energy demand for the SCWRRF, left blank in the reply of 12 September	Demand is proportionate to the treatment train described, and is controlled through the non-carbon emissions agreement	The magnitude score at the energy and emissions pathway would change, and the carbon footprint obligation could not be verified against a design figure	CRSEG
Reclaimed water destination and reuse points	Reclaimed water is directed to reuse points within the Project boundary, with quality controlled at the facility outlet	The receptors exposed to reclaimed water cannot be identified, so the exposure pathway cannot be closed out	CRSEG and Barbados Water Authority
Hydraulic capacity of the natural gully on the southeast side and its onward connection to the wetland drainage system	Stormwater is managed by the enclosed gravity network described, discharging through the southeast outfall to the natural gully on the southeast side, which is the routing finalized on 9 October 2026 following the AECOM review	If the gully conveys the discharge to the wetland drainage system at a rate or a quality this assessment has not anticipated, the runoff pathway rating and its controls both change. The routing itself is now settled. The hydrological study required before the first discharge to the gully resolves the remaining question of capacity	CRSEG, AECOM and the Employer
Bypass containment arrangement	Bypass is planned, sequenced and monitored, with bypassed flow receiving temporary treatment or held in contingency storage	The residual rating at the bypass discharge pathway does not hold. The Contractor has confirmed that the site presently has no capability for temporary storage or tanker removal	CRSEG
Number of process units taken out of service and the duration of each	Units are taken out of service in sequence, with duration fixed in advance and recorded	The total quantity of reduced-quality discharge over the construction period cannot be estimated	CRSEG
Whether site space permits building alongside operating units for the remaining works	Space permits the alongside approach for the new lift pump station and odor control facility, as confirmed, and for a majority of the remaining works	A greater share of the works would require units out of service, increasing bypass duration	CRSEG
Sludge and screenings disposal route	Screenings and grit are removed to an authorized route confirmed before first removal	Storage duration on site would extend, increasing the odor pathway	CRSEG and Environmental Protection Department

5.7.2. Baseline Information

The April 2026 baseline campaign does not meet the standard required for a full environmental and social baseline, and this assessment does not treat it as doing so. The limitations are stated here with the action that closes each. Until those actions are complete, the findings that depend on the affected parameter are qualified accordingly, and the residual ratings assume the monitoring program detects any deviation.

Table 25 presents the baseline limitations, effect on the assessment and closing action.

Table 25: Baseline limitations, effect on the assessment and closing action

Limitation	Effect on the assessment	Closing action	Held by
Single grab sample at each of five water quality locations	Establishes order of magnitude and identifies gross exceedances. Does not support statistical treatment, and averages are not read as representative of long-term conditions	Repeat sampling at each location across multiple rounds	CRSEG, under the Studies Report
All field data fall within the dry season	No wet-season condition is characterized, and wet-season loading is the condition under which runoff and bypass risk are highest	Wet-season sampling round	CRSEG, before the 2027 wet season
Sampling methodology details not recorded, including preservation, container type, transport temperature and time of sampling	Data quality cannot be independently verified	Chain-of-custody and preservation records retained on the certificate of analysis for every future sample	CRSEG and the analyzing laboratory
No groundwater baseline for the site	The condition of the aquifer beneath the site is not established	Monitoring wells installed and sampled at agreed points	CRSEG, agreed with Barbados Water Authority
No coastal or marine water quality data near the outfall	The condition of the receiving coastal environment and bathing waters is not established, which bears on the cumulative assessment	Coastal sampling round at agreed points	CRSEG, agreed with the Coastal Zone Management Unit
No night-time noise baseline at the residential receptors	Sleep disturbance operates at levels below those causing daytime annoyance and cannot be assessed against a daytime baseline	Night-time monitoring at the Harmony Hall receptors	CRSEG, before mobilization

Limitation	Effect on the assessment	Closing action	Held by
No 24-hour particulate measurement at Location 1	The particulate baseline rests on short-duration measurement	Full 24-hour measurement at Location 1	CRSEG, before mobilization
Greenhouse gas parameters not sampled	The carbon footprint obligation under the Contract has no baseline against which to measure	Carbon dioxide, methane and other greenhouse gases added to the monitoring program	CRSEG
Carbon monoxide readings of 141.9 and 117.8 mg/m3 exceed the World Health Organization 15-minute guideline of 100 mg/m3	Attribution is unresolved, so it is not established whether the Project inherits an existing exceedance or contributes to a new one	Repeat measurement and source investigation at Locations 1 and 5	CRSEG, before mobilization
Hydrological measurements not undertaken	Statements on hydrological disturbance rest on field observation of drainage direction and on the published record, and not on measured flow or level data	Hydrological study covering flow, level, direction and seasonal variation, reconciled against the final drainage routing	CRSEG designer, before the first discharge to the gully
Access to the Graeme Hall Nature Sanctuary not granted for the August 2026 field verification	Observations for that station derive from a visit on 10 April 2026 and are contextual	Access requested for the next verification round	CRSEG, with the Sanctuary

The closing actions in the table sit with the Contractor or its designer. The physical and chemical monitoring actions are measurements of the site and of the operating plant, and they are undertaken by the Contractor under the Studies Report obligation in the construction contract, with laboratory certification and chain of custody held by the Contractor and the analyzing laboratory. One action previously held by SAEDI Consulting, access to the Graeme Hall Nature Sanctuary[29], is now held by CRSEG.

Field data and the social baseline. The Project Execution Unit's review notes that four days of site visits in April 2026 are not a sufficient field basis for an assessment of this scope. The point is accepted for the environmental baseline, where it is answered by the pre-construction monitoring commitments in Section 8.5, and it is answered differently for the social baseline. The socio-economic profile of the Direct Area of Influence rests on the 2021 Census enumeration-area tabulations by age, sex, occupation, headship and tenure (Tables 39 to 41 and 44 to 46), on the household field exercise of 15 to 18 April 2026 (79 households, Section 7.7.1) and on the two town halls of 23 September and 8 October 2026, not on the site visits alone. Parish-level activity data by sex from the published 2021 Census report (Barbados

[29] It is important to note that this was an existing issue between the private owners and the project and despite further attempts, access still could not be achieved. The Sanctuary requested data that the site verification would yield as a requirement for site access permission, however as the subcontractor, SAEDI Consulting could not fulfil this demand and it was noted to the contractor and the BWA. This issue was not resolved.

Statistical Service, 2023) have been added. Initially, the census did not provide economic activity, disability, country of birth or formality of work by sex at enumeration-area level, and no source yet provides current rental values or travel times and fees for local services. These gaps were closed in the pre-construction baseline update from Statistics Barbados, the Community Health Assessment profile and field verification. The GRM awareness survey before camp occupation and the rental baseline under the Social Management Plan then extend the baseline through construction.

6. Environmental and Social Baseline

This section establishes the environmental conditions against which Program effects are assessed. It covers the physical setting, water quality across the wetland system, the aquifer and the coastal receiving environment, air quality and noise, the biological environment including the wetland's ecological character and avifauna, the socio-economic profile of the Area of Influence, and the receptors and vulnerable groups exposed to Program pathways.

Because the SCSTP upgrade and the SCWRRF new construction occupy adjacent footprints on the same parcel of land, they are governed by a single environmental and social baseline. The same applies for the Workers' Camp. The receptors, physical setting, and socio-economic context described here apply equally to both facilities and the Camp, ensuring that impacts are assessed against a common frame of reference. This unified baseline also underpins the Environmental and Social Management Plans, which are designed to apply consistently across the site, with facility-specific measures added only where operational differences require them. By treating the baseline as shared, the assessment captures cumulative effects more accurately and avoids duplication, while still allowing for differentiation where one facility or site element introduces unique pathways such as odor emissions or reclaimed water reuse.

Two features of the baseline should be read alongside every finding drawn from it. All field data fall within the dry season, so wet-season conditions, which govern runoff, standing water and bypass activation, are assessed on the physical characterization of the site and on professional judgment rather than on measurement. And the receiving environment is already under stress from urban drainage inputs, illegal dumping, storm damage and an altered hydrological regime, so Project effects are assessed as increments on a system with limited remaining capacity rather than on an undisturbed one.

6.1. Topography

-General Topography of Christ Church Parish

The project sites are located in the coastal parish of Christ Church at the southern end of Barbados. It has a land area of 57 km^2 (22 sq mi) *(Mindat.org, 2026)*. The average elevation is 46m, with a maximum of 212m. The top is characterized by relatively low-lying, flat topography, particularly in its coastal regions, in contrast to the more rugged, elevated terrain found in other parts of the island. This geographic configuration makes the parish highly sensitive to coastal processes, including erosion and sea-level variability. The landscape includes essential ecological zones such as the Graeme Hall Nature Sanctuary, which serves as the site of the last significant remaining mangrove swamp in Barbados. These mangroves are vital for coastal stabilization, sediment filtration, and providing critical habitats for local

biodiversity (Environmental Engineering Consultants, 2010; Mahon, et al., 2025). Elevation across Barbados is shown at Figure 27.

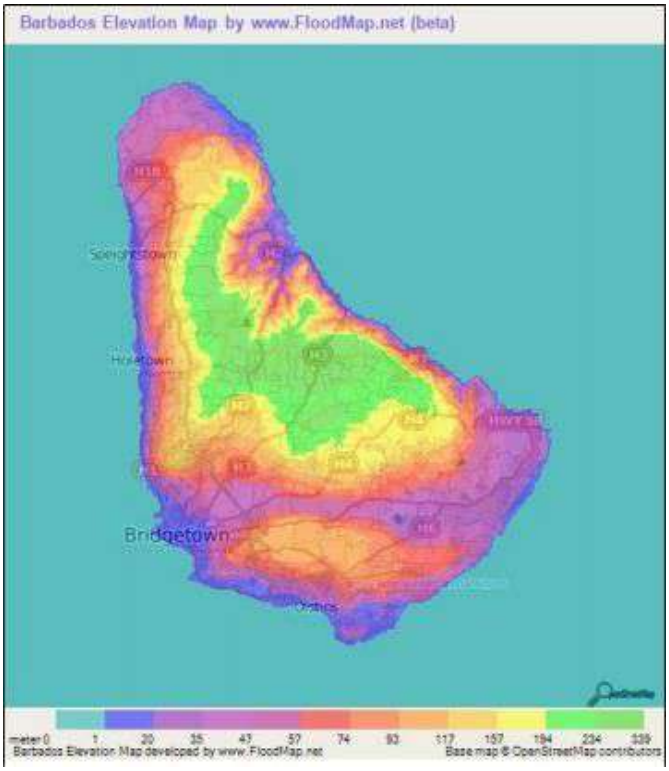


Figure 28: Elevation Map of Barbados

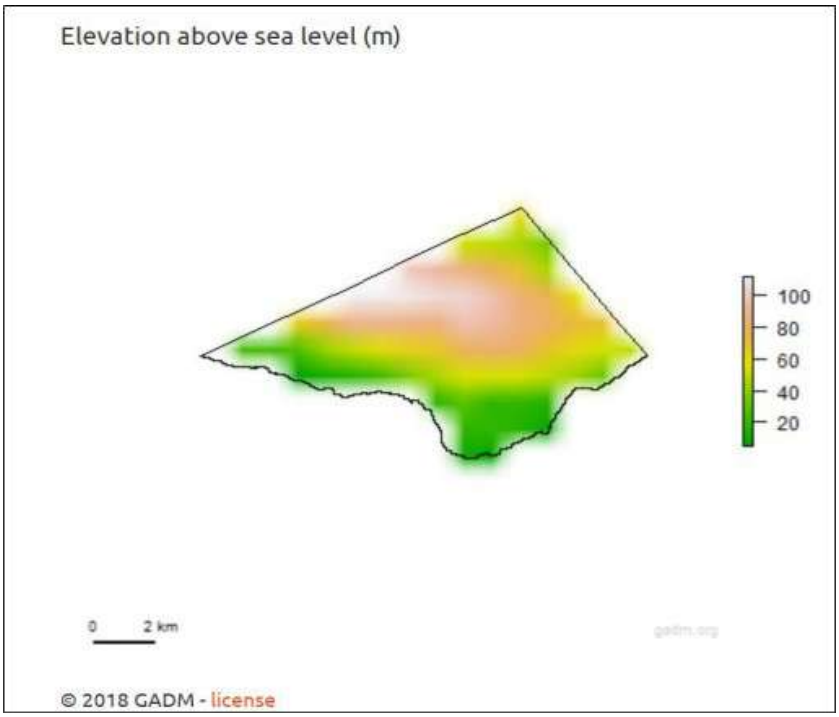


Figure 29: Topographical Elevation levels of the Christ Church Parish

This low-lying southern coastal corridor is generally characterized by relatively flat to gently undulating terrain, coastal limestone geology, extensive urban and tourism development, and sensitive marine and wetland ecosystems (see Figure 28). The district is environmentally significant because of its proximity to coral reef systems, coastal wetlands, groundwater recharge zones, and erosion-sensitive shorelines.

6.2. Climate

The climate is characterized by temperature, rainfall, seasonality, prevailing wind direction and speed, and extreme events. The dry season and wet season definitions applied in this assessment are used consistently throughout project review, having identified inconsistent seasonality definitions in earlier documentation.

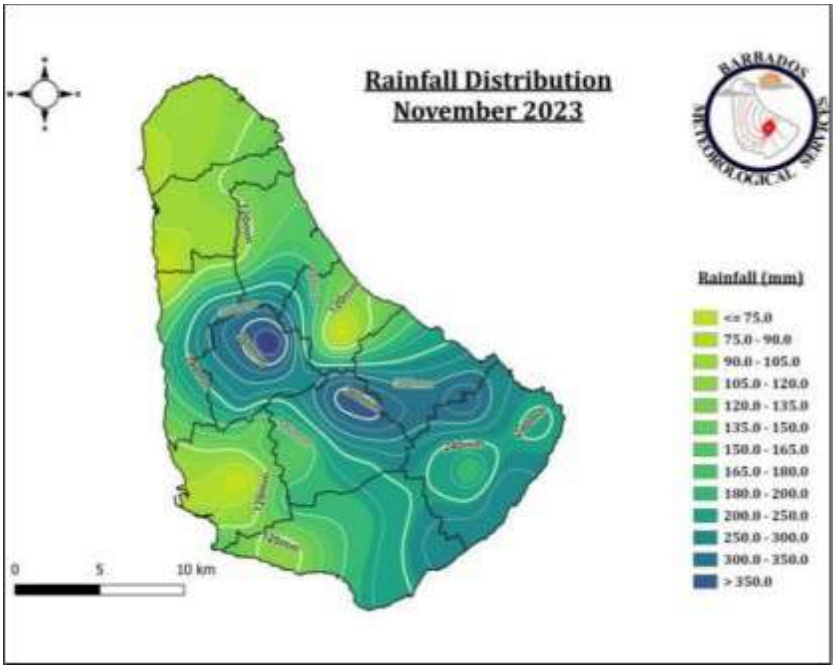


Figure 30: Rainfall Distribution Map – November 2023[30]

The climate baseline is illustrated at Figures 30 to 37: rainfall distribution for November 2023 and May 2026, mean rainfall and climatic characteristics for the 1991 to 2020 period, mean sunshine hours and recorded extreme events, maximum and minimum temperature distribution for May 2026, and the Barbados Meteorological Services peak temperature forecast for June to October 2026.

Christ Church and other west and south coast leeward areas are sheltered from the prevailing trade winds by the island's interior; these Caribbean-facing regions tend to be warmer, drier, and calmer. They receive the most sunshine and the least rainfall. Nevertheless, despite any specific localized differences, the island as a whole shares a tropical maritime climate defined by year-round warmth (temperatures typically between 24 °C and 29 °C) and two distinct seasons: a dry season and a wet season.

[30] Barbados Meteorological Services. (n.d.). Barbados weather. Accessed at https://www.barbadosweather.org/ (Barbados Meteorological Services, n.d.)

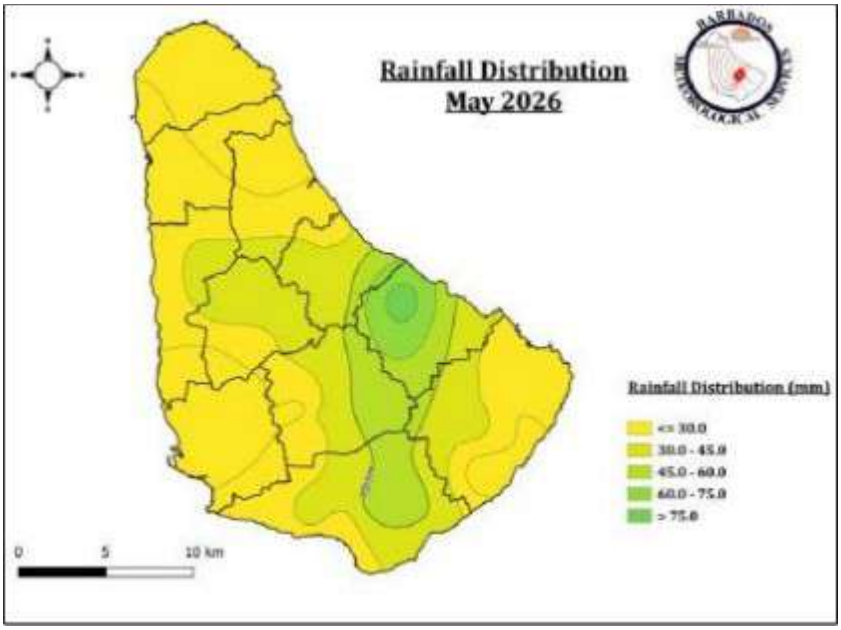


Figure 31: Rainfall Distribution Map – May 2026[31]

According to the May 2026 (Issue No. 76) - BMS Monthly Climate Outlook Newsletter, prepared by the Barbados Meteorological Services (BMS), May was dry, sunny and hazy this year, with minimal rainfall accumulations recorded during most of the month. Accumulatively, the agency reported that the total rainfall across the island for the May 2026 period was between 12.0mm and 79.8mm. While the month began relatively dry, a mid-month upper-level instability and a low-level trough brought in high levels of rainfall over several days. Notably, the highest recorded amount of rainfall, 40.5mm, occurred at Charnocks. This was noted by the BMS as being below the climatological average of the island of 74.1mm. This perspective is important to consider since rainfall levels ranged well above 300mm. This implies that the project team must prepare itself, activities, and the supporting physical structures for varying precipitation patterns that are likely to occur due to historical data for the season.

Additionally, it should be noted that a drier-than-normal wet season is expected in the coming months due to the emergence of El Niño in the hemisphere. The BMS also expects periodic intrusions of Saharan dust during this period.

[31] Ibid

MONTH	MEAN RAINFALL 1991-2020	MAXIMUM RAINFALL 1991-2020	MEAN RAIN DAYS 1991-2020	AVERAGE MAX. WIND SPEED 1991-2020	MEAN WIND DIRECTION 1991-2020
JANUARY	68.1MM	200.4MM	11	23KT	79(E)
FEBURARY	41.7M	95.3MM	9	23KT	82(E)
MARCH	38.9MM	87.2MM	8	22KT	89(E)
APRIL	58.1MM	153.4MM	8	22KT	91(E)
MAY	74.1MM	249.1MM	8	22KT	93(E)
JUNE	101.2MM	240.3MM	11	25KT	92(E)
JULY	121.5MM	303.5MM	15	24KT	94(E)
AUGUST	150.6MM	314.5MM	16	24KT	92(E)
SEPTEMBER	162.6MM	350.0MM	13	26KT	99(E)
OCTOBER	179.6MM	457.3MM	15	25KT	101(E)
NOVEMBER	172.6MM	513.9MM	14	22KT	110(E)
DECEMBER	91.0MM	327.9MM	11	23KT	81(E)

Figure 32: Several Mean Values of Rainfall Patterns of Barbados – 1991-2020[32]

MONTH	MEAN WIND SPEED 1991-2020	MEAN RH 1991-2020	MEAN TEMPERATURE 1991-2020	MEAN MAX. TEMPERATURE 1991-2020	MEAN MIN. TEMPERATURE 1991-2020
JANUARY	13KT	77%	26.0 °C	29.1 °C	23.3 °C
FEBURARY	13KT	76%	25.9 °C	29.2 °C	23.0 °C
MARCH	12KT	75%	26.3 °C	29.7 °C	23.4 °C
APRIL	13KT	76%	27.0 °C	30.2 °C	24.2 °C
MAY	13KT	77%	27.7 °C	30.6 °C	25.0 °C
JUNE	14KT	79%	27.8 °C	30.7 °C	25.2 °C
JULY	13KT	80%	27.8 °C	30.7 °C	25.1 °C
AUGUST	11KT	81%	27.9 °C	30.9 °C	24.8 °C
SEPTEMBER	9KT	81%	27.9 °C	31.0 °C	24.8 °C
OCTOBER	10KT	82%	27.7 °C	30.8 °C	24.7 °C
NOVEMBER	11KT	82%	27.2 °C	30.3 °C	24.5 °C
DECEMBER	12KT	78%	26.6 °C	29.6 °C	23.9 °C

[32] Ibid

Figure 33: Several Mean Values of Climatic Characterizations of Barbados – 1991-2020[33]

MONTH	MEAN SUNSHINE HOURS 1991-2020
JANUARY	8.5
FEBURARY	8.8
MARCH	8.8
APRIL	8.7
MAY	8.5
JUNE	7.5
JULY	8.1
AUGUST	8.4
SEPTEMBER	7.8
OCTOBER	7.7
NOVEMBER	7.6
DECEMBER	8.2

EXTREME EVENTS	
Maximum Temperature	34.2 °C (30 September 2023)
Minimum Temperature	16.5 °C (January 2nd 1984)
Highest Monthly Rainfall	513.9mm (November 1991)
Lowest Monthly Rainfall	3.6mm (February 2010)
Highest Daily Rainfall	255.0mm (September 28th, 2018)
Lowest Relative Humidity	39% (February 17th, 2008)

Figure 34: Mean Sunshine Hours – 1991-2020 and Extreme Events of Barbados[34]

[33] Ibid

[34] Ibid

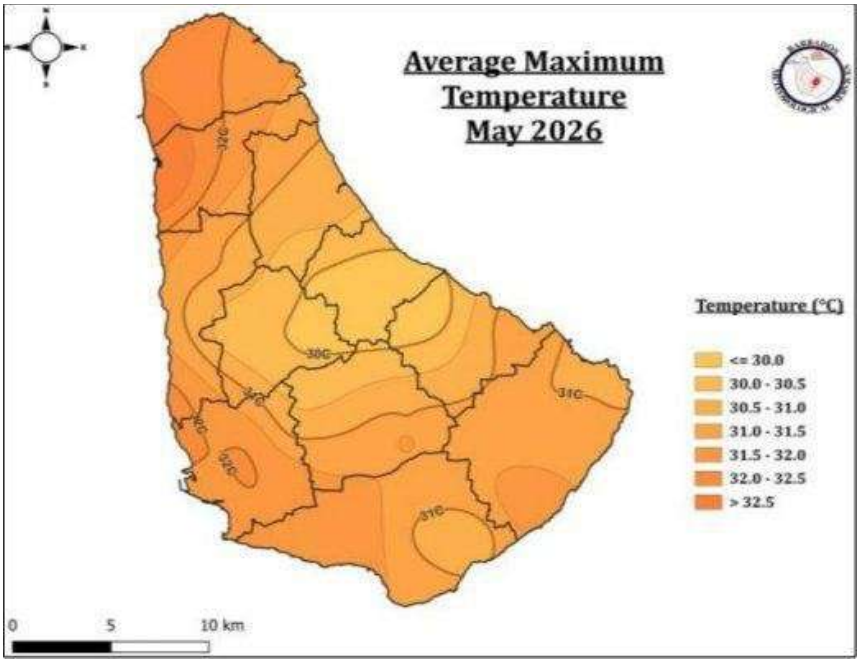


Figure 35: Average Maximum Temperature Distribution across Barbados – May 2026[35]

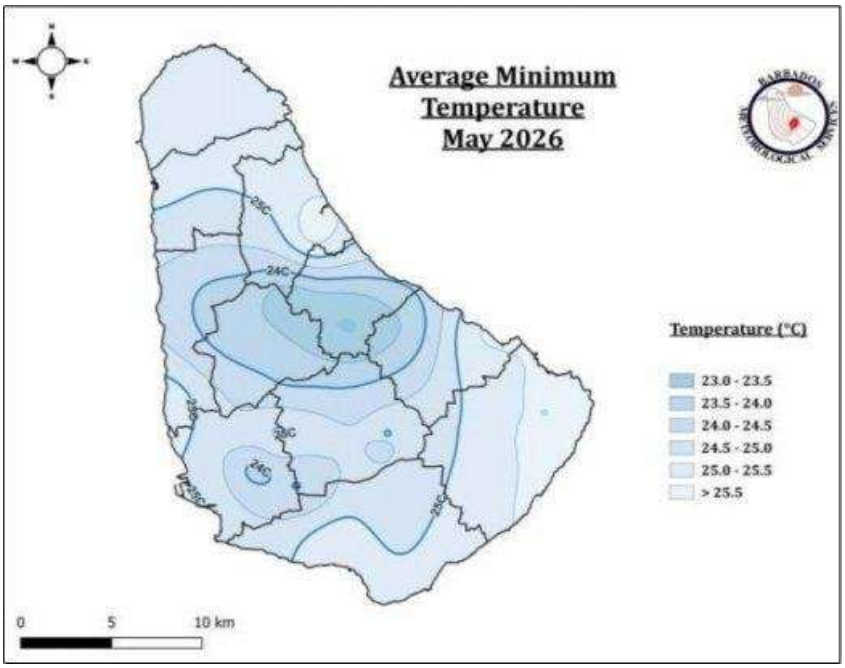


Figure 36: Average Minimum Temperature Distribution across Barbados – May 2026[36]

As previously mentioned, El Niño is expected to heavily influence weather patterns in the western hemisphere for the latter part of 2026. The latest seasonal forecasts indicate a pronounced shift toward El Niño conditions, with probabilities reaching 80% for June–August 2026 *(World Meteorological Organization (WMO), May2026)*. Likewise, the BMS estimates hotter-than-normal temperatures from June 2026 to October 2026, with daytime temperatures expected to peak between 32 °C and 34 °C in the

[35] Ibid
[36] Ibid

more populated and south-western districts. Therefore, the project team will consider these projections when preparing for construction and other outdoor operations for the Program. As such, regular reviews of the BMS website shall be integrated into overall project planning and execution.

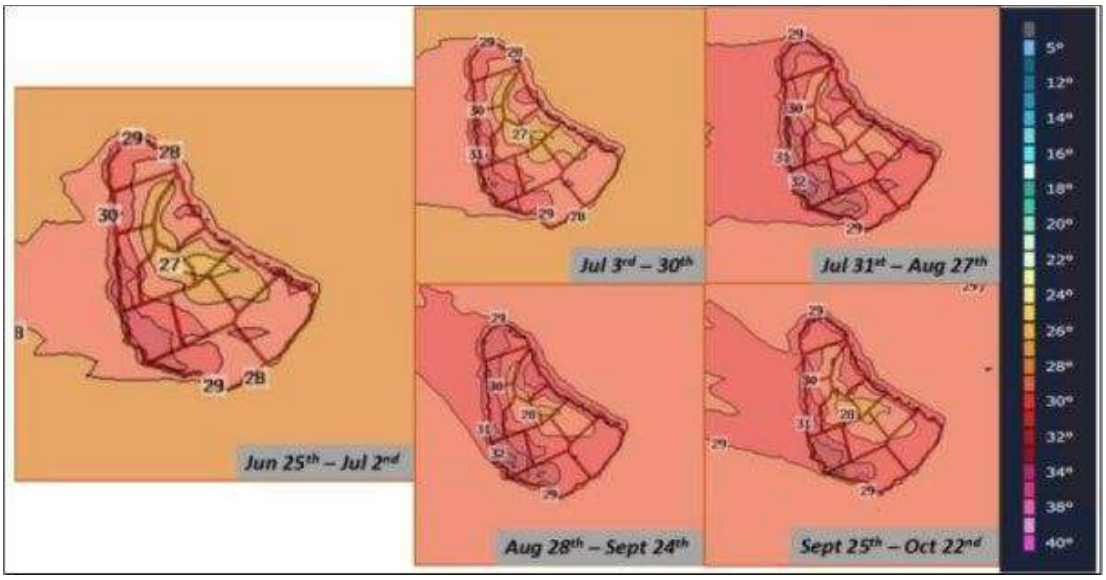


Figure 37: BMS Climate peak temperature forecast from June to October 2026

6.2.1. Climate and disaster risk context

Climate/disaster risk management clarification: The assessment considers hazard likelihood together with project exposure, the vulnerability of personnel, community and critical wastewater infrastructure, and the consequences of service interruption. Flooding, high winds, extreme rainfall, heat, storm surge and access-route disruption may affect the construction period and operation. Design-stage controls, drainage and resilient equipment siting; construction-period preparedness and controlled shutdown; and operational continuity and emergency response will be monitored through a Project Disaster and Climate Change Risk Management Plan, whose preparation and approval before construction is gate condition G-22 (Section 7.12), and through the ESMP. A community fatality indicator is zero recorded project-related fatalities, with each incident investigated and reported; this is a target and reporting indicator, not an assertion that no events have occurred. Evacuation route familiarization and drills shall be documented for each workforce cohort.

The climate and disaster risk context for the Project is drawn from the Climate Change and Disaster Risk Reduction Assessment and the Disaster and Climate Change Risk Management Plan prepared by SAEDI Consulting for the Health Services Resilience Program (SAEDI Consulting (Barbados) Inc., 2026). Those documents assess Barbados-wide hazard exposure on a consistent basis, and the hazard set applies to the SCSTP and SCWRRF sites. Table 26 records each hazard and its bearing on the Project.

Table 26: Climate and disaster hazard context for the Project

Hazard	National context	Bearing on the SCSTP & SCWRRF Sites
Tropical cyclone	Dominant systemic hazard nationally. Expected annual damage of 0.9 to 13	Prefabricated accommodation is vulnerable to wind loading. Secure or demobilize

Hazard	National context	Bearing on the SCSTP & SCWRRF Sites
and hurricane wind	percent of exposure value, against 0.016 to 0.023 percent for fluvial flooding and 0.002 to 0.006 percent for earthquake.	external equipment and stockpiles on warning; camp Emergency Response Plan applies.
Extreme heat	Heat-wave frequency rising sharply; 2023 and 2024 the highest in the 35-year instrumented record, and the most significant climate signal for design.	Directly supports the heat stress assessment required by IDB Annex 1. Bears on dormitory ventilation and cooling, work scheduling, hydration and rest breaks.
Rainfall flooding and access severance	Mapped flood extents commonly stop short of buildings but cross the roads serving them, making access rather than inundation the operative risk.	The camp has a single access route: an earthen dam of approximately 730 m. Loss of that route isolates the camp with the buildings intact. Alternative access and pre-positioning of supplies must be addressed in the Emergency Response Plan.
Drought and water stress	Island-wide operational exposure; the most severe SPI-12 signal in the recent record occurred in April 2016. Barbados is among the twenty most water-scarce countries on renewable freshwater per capita.	Camp storage capacity, conservation measures and tanker arrangements required during BWA supply restriction.
Wildfire and grassfire	Rated Moderate against a Very low national fire-weather classification, on the 2026 Barbados Fire Service record and documented grassfire damage to the overhead distribution network.	The campsite is vegetated with grasses and shrubs. Vegetation management, a cleared perimeter and fire precautions are required, and grassfire may remove power by damaging overhead lines rather than by reaching the site.
Saharan Air Layer dust	Recurrent particulate spikes exceeding the WHO PM10 guideline of 50 µg/m^3, operational rather than structural.	Compounds with construction dust during works. Relevant to the interpretation of the particulate baseline in Table 33 and to dust suppression scheduling and respiratory protection.
Earthquake	Low-frequency, high-consequence latent hazard at Medium national level.	Camp structures and foundations to be designed to CUBiC with a seismic zonal factor of Z = 0.375.

Two points warrant emphasis. First, the failure pathways that matter here do not begin with damage to the camp; they begin with the loss of a service the camp depends on but does not control. A grassfire that damages overhead distribution poles, or a cyclone that takes down the grid, removes power to pumping and sanitation without touching the buildings. The camp's generator provision and water storage should be sized and tested against that scenario rather than against direct structural damage.

Second, the camp is served by a single access route. The evidence across comparable Barbadian sites is that flooding severs approach roads while leaving buildings intact, and the campsite's access is an

earthen dam of approximately 730m crossing low-lying ground. Loss of that route would isolate the camp and interrupt worker rotation, supply delivery and emergency access. This is assessed in the Impact Assessment chapter and is carried into the Emergency Response Plan, which is to identify an alternative route or a defined shelter-in-place provision with supplies held on site.

6.3. Geology, Soils and Hydrogeology

Barbados is a limestone island. Approximately eighty-five percent of the land surface is capped by Pleistocene coral limestone overlying older sedimentary formations, and that limestone cap governs the island's hydrology. Rainfall infiltrates rapidly through solution channels and fissures with limited residence time in the soil profile, and surface runoff occurs mainly where the limestone is thin, where the ground is compacted, or where rainfall intensity exceeds the infiltration rate.

6.3.1. Soil classification and morphology

The soil taxonomy within the Christ Church area generally oscillates between two major groups, largely dependent on the geomorphological age of the terrace and local topography:

- **Vertisols (e.g., Typic Chromudert):** Frequently found in lower-lying areas or depressions, these are characterized by high clay content (often interstratified kaolinite-smectite). These soils exhibit significant shrink-swell potential due to the prevalence of smectite clays, leading to the formation of desiccation cracks during the dry season and "slickensides" (polished/grooved surfaces) within the soil profile.
- **Mollisols (e.g., Typic Hapludoll):** These are commonly observed on stable, older terrace surfaces. While still clay-rich, they often display more distinct horizonation compared to Vertisols and are generally more stable, though they remain subject to pedoturbation (natural soil mixing) processes.

6.3.2. Physical and hydrological properties

- **Texture and Structure:** The soils are typically heavy, clay-rich, and exhibit a strong angular blocky structure. It can be described as sandy loam to clay loam surface horizons, localized red to reddish-brown clay-rich subsoils, granular to blocky structure in weathered zones, and moderate aggregation due to carbonate content and weathering processes *(Cambridge University Press, 2017)*.
- **Permeability:** Despite high clay content, infiltration is heavily influenced by the underlying karst topography. While the soil matrix itself may have low permeability when saturated, the overall landscape often features high secondary porosity due to sinkholes, fractures, and drainage wells within the limestone, which facilitate rapid, direct recharge to the aquifer.
- **Erosion Risk:** Soil stability is highly dependent on vegetative cover. Given the tropical climate, areas with exposed soil are susceptible to rapid erosion during high-intensity rainfall events, particularly on the terrace slopes.

As such, for construction and infrastructure planning, the following environmental constraints are noted:

- **Foundation Engineering:** The shrink-swell nature of the clay-rich soils *(Vertisols)* requires specific geotechnical consideration for foundation design to prevent structural movement.

- **Drainage and Runoff:** Due to the potential for low surface infiltration when these soils are saturated, project design must incorporate adequate stormwater management to prevent surface ponding and localized flooding.
- **Soil Management:** The thin nature of some top-soil layers over the coral bedrock necessitates careful excavation and stockpiling protocols to ensure the viability of post-construction landscaping and environmental rehabilitation.

6.3.3. Soil assessment results

Site specific soil classification, morphology, and hydrological properties are established through site investigation (See results in Figures 38 and 39). Project review has recorded that reliance on historical published data alone is insufficient for this purpose

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CERTIFICATE OF ANALYSIS

Report Number: 2026-0399

3. Results

Sample ID	Agri Farm Loc (Sample 1)	Min of Agri (Sample2)	Back of Plant (Sample 3)	Community (Sample 4)	
Time Sample taken	8:00	8:19	10:00	10:30	
Laboratory ID	202601162	202601163	202601164	202601165	
Date received	4/16/2026	4/16/2026	4/16/2026	4/16/2026	
Date analysed					Date analysed
Nitrogen (mg/kg N)	3230	3304	1795	3353	5/15/2026
Phosphorus (mg/kg)	1288	3805	1936	2780	5/18/2026
Potassium (mg/kg)	1529	1522	925	572	5/15/2026
pH	7.37	7.32	7.51	7.47	5/14/2026
Organic Matter (%)	3.51	3.15	2.81	4.45	5/12/2026

Figure 38: Soil Sample Results from the Project Area

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pH	7.37	7.32	7.51	7.47	5/14/2026
Organic Matter (%)	3.51	3.15	2.81	4.45	5/12/2026

Figure 39: Soil Sample Results from the Project Area

According to the site assessment results, the rating for each parameter is summarized in Table 27.

Table 27: Overall Soil Condition

Parameter	Assessment
pH	Excellent
Organic Matter	Good
Nitrogen	High
Phosphorous	Very High
Potassium	Moderate – High

6.4. Hydrology and Drainage

GHS is the largest remaining inland mangrove and wetland system in Barbados and the only substantial one of its type on the island. It receives surface water from a watershed of approximately 1,158 acres, and the recognized wetland occupies approximately 33 hectares within a wider 100-year floodplain. Existing surface drainage from the Project site follows the natural gully along the eastern boundary toward the Eastern Marsh and the wider wetland system. That gully is the pathway assessed at PRJ-EI-01.

The wetland system comprises connected units that field verification examined in turn. The Eastern Marsh receives drainage from the north and east. The Upper Drainage conveys flow through the northern section. The Bisecting Canal provides internal hydrological connection between wetland areas and is the receiving water for the emergency bypass from the treatment plant. The Southern Wetland Interface carries the existing outflow conveyance toward Sandy Beach. The sluice gate at the coastal connection controls exchange between the wetland and the sea.

Two features of the system's hydrology bear directly on this assessment. The connection to the sea has been altered. Blocking of the canal to the sea has reduced saltwater intrusion, and the system has become predominantly freshwater. Field verification in August 2026 recorded the sluice gate as apparently inoperable. The consequence is a system with reduced tidal flushing and reduced capacity to dilute or export material entering it. The wetland already receives urban surface water. Field verification identified four drainage connections discharging into the swamp from the Harmony Hall and Bamboo Road areas as part of the wider flood management system. The receiving environment therefore carries an existing loading from urban runoff independent of the Project, which is relevant to the cumulative assessment.

6.4.1. Water Scarcity and the National Resource Position

Barbados is classified by the United Nations among the fifteen most water-scarce countries in the world. Available supply is below the 1,000 cubic meters per capita threshold at which a country is internationally classified as water-scarce. Rainfall is the source of all local freshwater, and it either runs off into surface impoundments or infiltrates through the coral rock to become groundwater.

That position is the reason the reclaimed water component carries the significance it does. Every cubic meter of reclaimed water applied to irrigation or returned to the aquifer is a cubic meter of potable supply not drawn down, in a country with no margin.

6.4.2. Groundwater Protection Zoning

Groundwater protection zoning was established in 1963 following the Tullstrom Study and revised in 1973, dividing the island into five zones with development restrictions set according to the travel time of contaminants to public supply wells.

Under the current policy the project falls within zone 5, classified as a Non-Recharge Contributing Area. This indicates fewer restrictions compared to other water protection zones (see Figure 39).



Figure 40: Map of Barbados Water Zones

A revised policy has been developed to replace it. The 2020 Water Protection and Land Use Zoning Policy proposes a five-zone structure designated Zone A to Zone E, comprising Pathogen Exclusion, Pathogen Management, Chemical Management, Recharge Contributing and Non-recharge Contributing Groundwater Protection Areas. Zone A applies strict controls where groundwater travel time is as short as 90 days. Legislative amendment has been advanced to enlarge the system and to introduce licensing of abstraction wells.[37]

The revised policy addresses two shortcomings in the 1963 system that bear on these facilities. The original zoning was designed against bacterial contamination and is ineffective against persistent chemical pollutants, with rising nitrate levels in groundwater identified as a national concern. And the original policy protected groundwater alone, without regard to coastal water quality, whereas the revised

[37] Ministry of Energy and Water Resources and Barbados Water Authority, Green Paper on the 2020 Water Protection and Land Use Zoning Policy, description of the 1963 Tullstrom zoning and the proposed Zone A to Zone E structure, including the 90 day travel time control applying to Zone A. (Ministry of Energy and Water Resources and Barbados Water Authority, 2020)

approach treats the whole island as a coastal zone and sets minimum wastewater discharge standards with the objective of protecting coastal waters as well as the aquifer.

Both shortcomings are directly relevant. The aquifer recharge component introduces a pathway to groundwater, and the reclaimed water specification must address persistent chemical parameters and nitrate, not pathogens alone. The zone applicable to the Project site governs the conditions attaching to recharge, and confirmation of that zone designation is required before the recharge component proceeds.

Three consequences follow for this facility.

- Infiltration through karst limestone provides limited natural attenuation. Water entering the ground moves through solution channels at speed, with none of the slow percolation through a soil matrix that would otherwise occur, so contaminants reaching the ground surface travel toward groundwater with less filtration than would occur in an alluvial or clay setting. This is the basis on which chemical and fuel storage is treated as a priority control and on which reclaimed water quality for aquifer recharge is assessed at PRJ-EI-09.
- The same rapid transmission means the aquifer is the island's principal freshwater source and is protected under a zoning system that restricts activities according to groundwater travel time to abstraction points. The zone applicable to the Project site governs the conditions attached to the recharge component.
- Where surface runoff does occur, it is rapid and carries suspended material. Combined with the fall from the site toward the wetland, this shortens the time available for sediment to settle before reaching the Eastern Marsh, which is the mechanism underlying PRJ-EI-01.

6.4.3. Water Quality

The water quality baseline comprises surface water in the wetland system, groundwater in the underlying aquifer, and the coastal receiving environment downstream of the sluice gate. Surface water quality in Graeme Hall Swamp has been the subject of repeated study. The published record establishes that periodic emergency discharge of untreated sewage into the wetland has been associated with elevated nitrogen, ammonia, phosphorus, orthophosphate, bacteria, algae and total suspended solids. A discharge in 2005 released between three and six million gallons of preliminary treated sewage, which traveled by overland flow across the government-owned spikerush marsh and into the lake, carrying organic waste, nutrients and pathogens together with chemicals, cleaners, oil and grease.

The available dataset is dated to 2018 and carries a limited sample count. Project review has recorded that sampling methodology details were not recorded, including preservation, container type, transport temperature and time of sampling, and that the sample count is insufficient for statistical reliability. The data are treated as indicative of condition and not as a quantitative baseline.

Parameters relevant to this facility comprise temperature, pH, salinity, conductivity, turbidity, dissolved oxygen, total suspended solids, total dissolved solids, biochemical and chemical oxygen demand, ammonia, nitrate, nitrite, total nitrogen, total phosphorus, chlorophyll a, fecal coliform, fecal enterococci, Escherichia coli, volatile and semi-volatile organic compounds, oil and grease, heavy metals and pesticides.

Graeme Hall water quality in 2010 and 2018 (Environmental Engineering Consultants, 2010; Environmental Engineering Consultants, 2019) presents results of water quality analysis carried out in February 2010 (Environmental Engineering Consultants, 2010) and October 2018 (Environmental Engineering Consultants, 2019). The 2010 data is based on sampling at 20 points in the Swamp over three consecutive days. The 2018 data is based on samples taken at four points in the Graeme Hall Nature Sanctuary over two consecutive days. The figures in Table 28 represent the average of the results obtained for each parameter over the respective sampling periods.

Table 28: Graeme Hall water quality in 2010 and 2018 (Environmental Engineering Consultants, 2010; Environmental Engineering Consultants, 2019)

Parameter	February 2010	October 2018
pH	8.23	8.3
Nitrates (mg/l)	0.15	<0.2
Total phosphorus (mg/l)	0.4	1.15
Salinity (ppt)	1.4	1.0
TSS (mg/l)	39	39
Dissolved oxygen (mg/l)	4.6	8.0
BOD (mg/l)		10
Enterococci (cols/100ml)	842	1,187
Fecal coliform (cols/100ml)		9,500
Chlorophyll-A (mcg/l)	33	84
Turbidity (NTU)	12.3	30.7

The 2010 EEC survey included an analysis for a broader range of parameters, with findings summarized in Table 29.

Table 29: Nutrients and other Water Quality Parameters EEC (2010)

Parameter	Findings
Alkalinity	The average alkalinity, 275 mg/l, twice the alkalinity of seawater near Barbados,
Ammonia	The average ammonia level from the two ponds increased from 0.021 mg/l in 2002-2003 to 0.141 mg/l in 2010

Parameter	Findings
Chlorophyll A	Chlorophyll-a results ranged from 25.3 ug/l in the east pond to 137 ug/l in the west pond. The high reading reflected the most algae of all onsite and offsite sample locations, indicating potentially high nutrient load and eutrophic conditions.
Tannin Chloride	Tannins and lignins averaged a relatively low 0.8 mg/l, reflecting the groundwater source for the ponds.
Fecal coliform	Fecal coliform averaged 460 colonies/100 ml, down approximately 50% from 2002.
Fecal streptococci	Fecal streptococcus averaged 565 colonies/100ml, approximately 325% higher than the results from April 2002

The metals determined in the 2010 EEC survey, and the findings for each, are given in Table 30.

Table 30: Metals analyzed by EEC (2010)

Metal	Findings
Copper	Relatively high, averaging 0.004 mg/l for the two ponds
Iron	Higher from the two ponds than from other sampled areas.
Lead	Less than laboratory detection limits.
Magnesium	Relatively low, reflecting the freshwater condition of the ponds
Mercury	Less than laboratory detection limits.
Phosphorus	Phosphorus levels averaged 0.16 mg/l, compared with phosphate levels in 2002 of less than 0.005 mg/l.
Potassium	Relatively low, reflecting the freshwater condition of the ponds
Zinc	The average zinc concentration of 0.029 mg/l was similar to the average observed from all onsite and offsite sample locations with the exception of the lake, which averaged 0.01 mg/l,

No groundwater quality baseline exists for the site. The recharge component makes this material, and the monitoring program establishes it before recharge commences.

6.4.4. Baseline Coverage and Confidence

Water quality was characterized from five locations with a single grab sample at each, and air quality and noise were monitored at three and eight locations respectively over three days. All field data fall within the dry season, and no wet-season data exists as previously mentioned.

Single grab samples establish order of magnitude and identify gross exceedances, and they do not support statistical treatment. Averages derived from them are not read as representative of long-term conditions.

Sampling on 16 April 2026, with influent values also drawn from the January to February 2026 round, characterized the influent to the plant, the effluent leaving it, and the surrounding environs. The effluent results establish the condition the upgrade is intended to correct.

Table 31 presents the sampling, standards and interpretation.

Table** 31**: Sampling, Standards and Interpretation

Parameter	Influent	Effluent	Standard	Interpretation
Suspended solids	89 mg/L	142 mg/L	30 mg/L, Environmental Protection Department marine limit	Effluent exceeds both the influent and the limit
Biochemical oxygen demand	215 mg/L	205 mg/L		Removal of organic load is negligible
Ammonia		approximately 26 percent removal		Nitrification is not occurring
Total phosphorus		4.7 mg/L	0.025 mg/L	Exceeds the environmental limit by two orders of magnitude
Copper		1.72 mg/L	1.0 mg/L	Exceeds the regulatory limit
Fecal coliforms and enterococci		exceed safe limits by orders of magnitude		Disinfection failure

Based on these results the plant is not treated. For several parameters the effluent leaving the works is worse than the influent entering it.

Three consequences follow for this assessment:

- The condition of the receiving environment has a continuing source, and the upgrade is the mechanism by which that source is removed. The beneficial outcome assessed at EI-05 is therefore measured against a quantified starting point.
- Incremental load arriving during construction is assessed against a system already failing its consented performance and not against design capacity. Foul discharge from the workers' camp forms part of the influent to this plant.
- The bypass pathway assessed at EI-01 and EI-02 diverts flow around a process that is not currently achieving removal, so the quality shortfall during a bypass event is smaller than it would be at a functioning plant while the absolute discharge quality remains poor.

Confirmation of the receiving sewer's available capacity also remains outstanding.

Additional sampling rounds covering the wet season, and repeat sampling at each water quality location, are scheduled for the South Coast Sewage Treatment Plant and the South Coast Water Reclamation and Re-use Facility. Preservation method, holding times, container types and chain-of-custody records for each sample are held by the analyzing laboratory and are recorded in the certificates of analysis.

6.4.5. Influent Quality to SCWRRF

The reclamation facility will receive treated effluent from the adjacent South Coast Sewage Treatment Plant. Sampling on 16 April 2026 recorded that plant discharging suspended solids at 142 mg/L against 89 mg/L entering it, biochemical oxygen demand falling only from 215 to 205 mg/L, ammonia removal of approximately 26 percent indicating that nitrification is not occurring, total phosphorus at 4.7 mg/L against an environmental limit of 0.025 mg/L, and fecal coliforms and enterococci exceeding safe limits by orders of magnitude.

The water quality results are garnered from an independent study led by CRSEG and are set out in Table 32, which gives the measured values for the surrounding environs, the SCSTP influent and the SCSTP effluent, the applicable standard, and the interpretation. Values for the influent are drawn from the January to February 2026 sampling round and those for the surrounding environs, influent and effluent from the round of 16 April 2026.

Table** 32**: Water quality results and interpretation

Parameter	Surrounding environs	SCSTP influent	SCSTP effluent	Standard and interpretation
Temperature	29.4–30.8 °C	—	not reported	
pH	7.23–7.67	—	not reported	
Total Suspended Solids	7–23 mg/L	89 mg/L	142 mg/L	EPD marine limit 30 mg/L. Effluent exceeds influent: no solids removal
Turbidity	11–30 NTU	157 NTU	not reported	
Dissolved oxygen	5.7–7.2 mg/L	<1.0 mg/L	not reported	
Biochemical Oxygen Demand	—	215 mg/L	205 mg/L	Virtually no organic load removal between influent and effluent
Chemical Oxygen Demand	—	436–888 mg/L	not reported	
Salinity	0.22–0.31 ppt	0.47 ppt	not reported	
Ammonia-N	<0.05–0.42 mg/L	50 mg/L	approx. 26%	Nitrification failure

Parameter	Surrounding environs	SCSTP influent	SCSTP effluent	Standard and interpretation
			removal	
Total Phosphorus	0.28–0.37 mg/L	4.4 mg/L	4.7 mg/L	Environmental limit 0.025 mg/L. Effluent exceeds influent
Manganese	0.022–0.067 mg/L	0.035 mg/L	not reported	
Copper	0.058–0.143 mg/L	0.128 mg/L	1.72 mg/L	Barbados regulatory limit 1.0 mg/L. Exceeded
Fecal coliform	—	6.0×10^6 CFU/100 mL	exceeds safe limits by orders of magnitude	Disinfection failure
Enterococcus spp.	1.8×10^2 CFU/100 mL (back of plant)	1.0×10^6 CFU/100 mL	exceeds safe limits by orders of magnitude	Disinfection failure
Alkalinity	—	352–394 mg/L	not reported	
Calcium	—	79–153 mg/L	not reported	
Magnesium, Sodium, Iron, Aluminum	—	Mg and Na within normal municipal range; Fe 1.2–1.3 mg/L; Al <0.005–0.04 mg/L	not reported	
Fluoride	—	2.88–3.49 mg/L	not reported	
Sulfate	—	32–35 mg/L	not reported	
Chloride	—	132–196 mg/L	not reported	
Oil and grease	—	26–79 mg/L	not reported	

The consequence for this facility is that its influent quality depends on completion of the treatment plant upgrade. The reclaimed water quality targets assessed at PRJ-EI-09 are achievable only where the upgraded plant delivers the influent standard the reclamation process is designed to receive.

6.5. Air Quality

Baseline sampling in April 2026 covered particulate matter at 2.5 and 10 micrometers, sulfur dioxide, nitrogen dioxide, carbon monoxide and hydrogen sulfide at three locations, one of which lies within the boundary of this facility. The data provides a pre-construction reference point.

Carbon dioxide, methane and other greenhouse gases were not sampled. Those parameters are required under the Contract and are addressed at PRJ-EI-12. The full dataset for all monitored locations, with guideline values and an assessment against them, is held with the certificates of analysis. Table 33 presents the three monitored locations against the applicable guideline values.

Table** 33**: Air quality baseline results against applicable guidelines

Parameter	Averaging period	Location 1 (downwind)	Location 4 (upwind)	Location 5 (upwind boundary)
PM2.5	**1 h (Loc 4, 5); 12 h (Loc 1)**	24.64 µg/m^3	0.57 µg/m^3	0.33 µg/m^3
PM10	**1 h (Loc 4, 5); 12 h (Loc 1)**	59.61 µg/m^3	4.86 µg/m^3	1.83 µg/m^3
SO_2	**10 minutes**	396.4 µg/m^3	212.2 µg/m^3	33.8 µg/m^3
NO_2	**1 hour**	0.63 µg/m^3	11.03 µg/m^3	10.7 µg/m^3
H_2S	**10 minutes**	0.018 ppm	0.03 ppm	0.04 ppm
CO	**15 minutes**	34.1 mg/m^3 (Day 1); 117.8 mg/m^3 (Day 2)	61.7 mg/m^3	141.9 mg/m^3

6.6. Noise

Ambient noise monitoring was undertaken on 15 to 17 April 2026 at eight locations using calibrated Type 2 sound level meters. Location 1 lies within the boundary of this facility, downwind of the workers' campsite, and records daytime averages between 51.7 and 58.6 dB(A).

The nearest residential cluster, captured at Location 3, records daytime averages between 56.3 and 60.5 dB(A). The World Health Organization Community Noise Guidelines, adopted under the National Noise Policy, identify 55 dB(A) as the daytime threshold for serious annoyance in outdoor living areas. Ambient conditions at that receptor therefore sit at or above the guideline value before Project activity commences, and construction noise is an increment upon an existing exceedance.

6.6.1. Measured Ambient Noise

Pre-construction ambient noise monitoring was undertaken on 15, 16 and 17 April 2026 at eight locations using REED R8080 Type 2 sound level meters, serial numbers 220106871 and 230604542, with factory calibration dated 2 September 2025 and field calibration on 13 April 2026.

Table** 34**: Ambient noise monitoring results, April 2026

Location	Setting	Daytime average, dB(A)	Maximum, dB(A)
Location 1	Within the boundary of the new facility, downwind of the workers camp	51.7 to 58.6	82.1
Location 2	Within the existing facility compound, downwind of the pump	63.8	Most significant existing source
Location 3	Harmony Hall residential cluster	56.3 to 60.5	At or above the guideline before Project activity
Location 4	Upwind boundary	50.6	Lowest recorded average
Location 5	Boundary between the campsite and farmland	57.3	Elevated by agricultural and road activity
Location 6	Access route	55.8	At the guideline value
Location 7	Security hut	70.9	89.2, highest maximum recorded
Location 8	Control location	51.5	Lowest maximum

Table 34 shows noise levels measured before any construction, at eight points. Two readings matter. Location 3, the nearest houses at Harmony Hall, already sits at or above the 55 dB(A) guideline, so construction noise adds to a level that is already too high instead of creating a new problem. Location 2, inside the existing plant, reads 63.8 dB(A) from the pumps, which shows the plant is already a noise source for its neighbors.

Three findings follow. The nearest residential cluster at Location 3 already records daytime averages between 56.3 and 60.5 dB(A), at or above the World Health Organization threshold of 55 dB(A) for serious annoyance in outdoor living areas, so the Project contribution at that receptor is an increment on an existing exceedance. Location 2 within the existing plant compound records the most significant existing source at 63.8 dB(A), attributable to pump operation, which establishes the plant itself as a continuing noise source independent of construction. Location 7 records the highest maximum at 89.2 dB(A), associated with transient activity at the security hut.

Monitoring at the upwind locations was conducted during working hours only. No night-time baseline exists for the residential receptors. CRSEG confirmed in November 2026 that construction power is drawn from the Barbados national grid for all purposes except welding, so the camp is not supplied by a continuously running generator. A night-time baseline at the Harmony Hall receptors completes the noise baseline, and the night-time guideline of 45 dB(A) outside bedrooms is applied as the assessment reference.

6.7. Biological Environment

The priority ecosystem-service pathways include water purification and wetland filtration, flood attenuation and stormwater conveyance, habitat and fisheries support, and cultural/recreational use. Direct impacts include vegetation loss, runoff and disturbance; indirect impacts include pollutant transport to the wetland and coastal waters; cumulative impacts arise where existing wastewater, urban runoff, habitat pressures and severe-weather hazards combine. Drought, heavy rainfall and climate change may alter service reliability and community health exposure. These pathways are screened in the Critical Habitat Assessment and relevant water-quality, ecological and emergency-management plans; no unmeasured ecosystem-service benefit is assumed.

The biological environment of the project area reflects the ecological character of the wetland system and its interface with terrestrial, aquatic, and coastal habitats. Because the SCSTP upgrade and the SCWRRF new construction as well as the Workers' Camp occupy adjacent footprints on the same site, they share the same ecological receptors and biodiversity context. This includes wetland vegetation, avifauna, and aquatic species already under pressure from altered hydrology and urban inputs. The baseline therefore provides a unified description of the biological environment, with facility-specific considerations highlighted only where operational differences introduce distinct pathways of interaction.

6.7.1. Marine habitats and ecosystems

The project area lies adjacent to an area characterized by extensive fringing coral reefs, seagrass meadows, sandy lagoons, reef flats, patch reefs, and nearshore hard-bottom communities. These ecosystems collectively support one of the most productive marine environments on the island and provide critical ecological, economic, and social services. The benthic habitat survey prepared by BRI in 1984 provided some information about the marine habitat and biodiversity in the St Lawrence Lagoon, describing dense seagrass beds, high macroalgae diversity, and a high density of juvenile reef fishes using the coral rubble bank protecting the lagoon.

Recognizing the importance of the greater GHS marine ecosystem, UWI-CERMES undertook annual monitoring of the mangroves in GHS and the seagrass community in the adjacent St Lawrence lagoon from 1993 to 2020. This monitoring was guided by a protocol developed as part of the Caribbean Coastal Marine Productivity (CARICOMP) program, which ran from 1985 to 2007. As part of the monitoring program, the first detailed habitat description and map of the lagoon was produced by *Parker and Oxenford in 1998*. This region is characterized by a narrow limestone shelf extending 2 to 3 km offshore, which supports a highly dynamic but ecologically stressed marine community *(Hanoman-Van-Sluytman, 2014)*.

A detailed marine habitat map was then produced for the entire island in 2015 under the GoB CRMP study *(Baldwin, Oxenford, Purkis, & Knowles, 2019),* and a satellite image was subsequently generated that highlighted the marine habitats of the St Lawrence Lagoon area, together with the locations of four permanent coral reef monitoring sites that have been monitored by the GoB since 1997. However, historically dominated by critical structural framework builders such as Elkhorn coral (*Acropora palmata*) and Staghorn coral (*Acropora cervicornis*), these reefs have experienced profound phase-shifts over the last several decades due to regional bleaching anomalies, overfishing, and localized land-based sources of pollution *(Lirman & Schopmeyer, 2016)*. Live coral cover has dropped significantly, sitting at

approximately 12%. Concurrently, opportunistic species have claimed the substrate, with sponges accounting for roughly 28% and macroalgae covering 18% of the remaining hard bottom *(Hanoman-Van-Sluytman, 2014)*.

The region contains several important marine habitats that are interdependent. Therefore, it will always be important to consider what ongoing development in this location means for the health of these ecosystems. Several of these habitats are discussed below.

6.7.2. Seagrasses

Extensive seagrass meadows occur within the sheltered coastal waters throughout the Christ Church Parish, particularly in the St Lawrence area. Some seagrasses that dominate the area include Turtle Grass (*Thalassia testudinum)*, Manatee Grass (*Syringodium filiforme),* Shoal Grass *(Halodule wrightii)*. For the first nine years of the UWI-CERMES monitoring program (1993-2001), two permanent CARICOMP monitoring plots within the seagrass beds were assessed once or twice a year to record their health status and productivity. Between March 2001 and March 2002, the limited but dense Turtle Grass (*Thalassia testudinum)* and Manatee Grass (*Syringodium filiforme)* seagrass beds in the lagoon virtually disappeared.

Several factors are thought to have contributed to the seagrass decline, including eutrophic outflows from the GHS, rapid rates of beach sand accretion and depletion, increased terrestrial runoff of storm drain water, flushing of newly constructed sewerage pipes in 2001 and 2002, and extremely heavy grazing by an unusually high recruitment of the white sea urchin (locally called sea egg) (*Tripneustes ventricosus*) in 2001. These impacts were likely exacerbated by sand movements associated with tropical storms and other extreme weather events *(Mahon, et al., 2025)*.

Because seagrass meadows occur immediately adjacent to coral reefs, they reduce suspended sediments reaching reef communities while simultaneously providing nursery habitat that supports reef fish populations. This ecological connectivity is widely recognized as essential for maintaining reef resilience throughout the Caribbean (United Nations Environment Programme, 2020).

Seagrass ecosystems provide several essential ecological functions, such as a nursery habitat for juvenile reef fishes, habitat for queen conch and lobsters, feeding grounds for sea turtles, sediment stabilization, nutrient cycling, blue carbon storage, and improvement of water clarity.

6.7.3. Ichthyofauna and mobile Macro-Invertebrates

The composition of the local fish community is directly tied to this structural complexity. Fish population densities and sizes exhibit strong gradients across the southern shelf, heavily influenced by localized artisanal fishing pressures and habitat quality *(Chapman & Kramer, 1999)*.

- Resident Reef Fish: Dominant families observed within the Christ Church nearshore zone include parrotfish *(Scaridae)*, damselfish *(Pomacentridae)*, surgeonfish *(Acanthuridae),* and grunts *(Haemulidae)*.
- Macro-invertebrates: Herbivorous Sea urchins, particularly Diadema antillarum, are present in low numbers. Their grazing activity is crucial for keeping macroalgal overgrowth in check and exposing bare substrate for potential coral larval settlement *(Lirman & Schopmeyer, 2016)*.

6.7.4. Intertidal zones and sandy shorelines

The sandy beaches extending across Christ Church represent critical high-energy intertidal interfaces. Between reef patches, extensive carbonate sand flats and limestone pavement communities occur. Although often perceived as low-diversity habitats, these environments support creatures such as sea cucumbers, sea stars, echinoderm, mollusks, burrowing crustaceans, benthic algae, and juvenile fishes. Additionally, hard-bottom substrates provide colonization surfaces for macroalgae, sponges, octocorals, juvenile hard corals and encrusting organisms. These habitats function as transitional zones linking reef and seagrass ecosystems while providing important feeding grounds for numerous fish species. These dynamic shorelines are highly susceptible to severe coastal erosion driven by wave action and rising sea levels. This vulnerability has required extensive public and private shoreline stabilization programs, including the construction of breakwaters, groins, and continuous boardwalks to protect fragile coastal fringes (Cumberbatch, 2016).

6.7.5. Terrestrial ecosystems and biodiversity

Terrestrial ecosystem context.

The terrestrial environment of the south coast of Christ Church Parish is a highly modified landscape, dominated by urban and peri-urban development, tourism infrastructure and agricultural land (Inniss, 2020). Natural vegetation is severely fragmented and shows a high degree of anthropogenic disturbance; remnant natural ecosystems are largely confined to secondary coastal scrub, pioneer salt-tolerant plant communities on exposed limestone pavement, and the specialized fringing vegetation of the parish's few remaining coastal wetlands (Carrington, 2007). These fragments continue to perform an ecological function disproportionate to their size, buffering land-based pollution and surface runoff while remaining under continuous pressure from the expansion of residential and commercial development (Government of Barbados, 2023).

Recognized conservation areas.

Beyond the GHS, the principal site of recognized ecological value in the vicinity is the Chancery Lane Swamp, an eight-acre seasonal wetland of shallow open water, mudflats and grassy meadow bounded by a vegetated seaward berm, some distance further east along the south coast (Key Biodiversity Areas Partnership, 2009). It is designated a Key Biodiversity Area and serves as an important stopover for migratory shorebirds on the Atlantic Flyway, though it remains privately owned and exposed to encroachment from adjacent residential development and illegal dumping (Key Biodiversity Areas Partnership, 2009). The Woodbourne Shorebird Reserve, a former hunting swamp converted to a managed freshwater refuge in 2008 and opened to its first migrant shorebirds the following year, is a second notable site: one of the few actively managed habitat-restoration areas in the parish, it continues to operate as a sanctuary for migratory waterfowl (BirdsCaribbean, 2024).

Terrestrial fauna and species of conservation concern.

Regional terrestrial fauna spans a small number of highly adaptable, urban-tolerant residents alongside a much larger number of vulnerable, range-restricted endemics. Avifaunal diversity is comparatively robust, sustained by migratory waders and by resident endemics such as the Barbados bullfinch (*Loxigilla barbadensis*), whose populations in built-up areas show markedly better problem-solving performance and immune function than their rural counterparts, an adaptation associated with living alongside people (Audet, Ducatez, & Lefebvre, 2016). Mammalian diversity is limited to bats roosting in

nearby coastal caves, introduced green monkeys, and populations of black rats and the small Indian mongoose; the mongoose in particular is now recognized in Barbados as a significant predator of native reptiles, ground-nesting birds and sea turtle nests (Biodiversity Barbados, 2025). Invertebrate diversity includes the endemic Barbados velvet worm alongside a number of introduced agricultural pests (Inniss, 2020).

Terrestrial reptile diversity carries the most acute conservation concern of any regional taxon, driven chiefly by historic and ongoing habitat loss. Table 35 summarizes the three reptile species of principal concern, together with the island's endemic bullfinch, identified in the literature.

Table** 35**: Terrestrial reptile and endemic bird species of conservation concern, Christ Church Parish

Common name	Scientific name	Taxonomic group	IUCN Red List status	Regional distribution and ecology
Barbados leaf-toed gecko	*Phyllodactylus pulcher*	Reptile	Critically Endangered	Highly fragmented; confined to roughly 18 hectares of remnant coastal limestone cliff on the south/south-east coast. Population estimated at 6,000 individuals.
Barbados skink	*Alinea lanceolata*	Reptile	Critically Endangered (Possibly Extinct)	Historically known only from the Graeme Hall Swamp and Chancery Lane; last recorded in 1889. Highly vulnerable to introduced mammalian predators.
Barbados threadsnake	*Tetracheilostoma carlae*	Reptile	Critically Endangered	Endemic micro-snake reaching about 10 cm; exceedingly rare, restricted by loss of secondary forest and ground-layer habitat.
Barbados bullfinch	*Loxigilla barbadensis*	Bird	Least Concern (Endemic)	Highly adaptive to human-modified landscapes; widespread across the parish's urban and scrub environments.

Source: IUCN Red List status per Daltry (2016) for Phyllodactylus pulcher and Horrocks and Daltry (2017) for Alinea lanceolata; other entries per Inniss (2020).

The Barbados leaf-toed gecko is confined to narrow, unprotected strips of coastal limestone cliff, a refuge of roughly 18 hectares supporting an estimated population of 6,000 individuals, which leaves it highly exposed to stochastic events such as volcanic ashfall and to the continuing expansion of coastal housing (Blades & Vique Bosquet, 2025).

Anthropogenic pressures.

Terrestrial biodiversity in the parish sits under sustained development pressure: decades of land-use planning favoring coastal tourism and residential growth over habitat retention have driven the fragmentation described above (Government of Barbados, 2023). Invasive species add a second, compounding pressure. Beyond the mongoose's impact on native herpetofauna and birds, the spread of the non-native house gecko (*Hemidactylus mabouia*) is displacing native reptiles from suitable

microhabitat through competition, while the giant African snail and the pink hibiscus mealybug degrade vegetation condition more broadly (Williams, 2020).

Ecological context of the project site.

Set within this heavily modified regional matrix, the GHS and the adjoining project footprint function as a critical, largely isolated ecological refuge. As the island's last major intact coastal wetland, the site anchors what is otherwise a much-diminished network of south-coast green space (Centre for Resource Management and Environmental Studies, 2007), and it supplies provisioning and regulating ecosystem services, together with habitat for both endemic terrestrial species and long-distance migratory flyways, that the surrounding urbanized parish can no longer provide on its own (Inniss, 2020).

6.7.6. The Graeme Hall Swamp

Graeme Hall, officially designated as GHS, is a wetland located downstream from the South Coast Sewage Treatment Plant (SCSTP) and adjacent to the shore. It is surrounded by agricultural land and urban areas, making it a vital natural area in Barbados. GHS is particularly significant as it houses the last significant mangrove forest ecosystem in the country, spanning approximately 33 hectares. The wetland comprises two distinct areas: (i) the western portion, covering 13.68 hectares, is privately owned and designated as the Graeme Hall Nature Sanctuary (GHNS), while (ii) the eastern portion, covering 19.37 hectares, is owned by the Barbados Agricultural Development and Marketing Corporation. It is the single most critical terrestrial and brackish-water ecological feature within the Christ Church Parish.

GHS is perhaps the most extensively researched ecosystem in Barbados, having been the subject of numerous studies aimed at documenting, *inter alia*, the state of and changes in its hydrology, ecosystems and habitats, and plant and animal biodiversity. Lying within a wider green area of approximately 240 acres, the 33-hectare wetland represents the last remaining mangrove forest of its kind on the island and was officially designated as a Ramsar Site of International Importance in December 2005 (Williams A. , 2008).

The wetland is heavily dominated by Red Mangroves *(Rhizophora mangle)* along the interior water channels and White Mangroves *(Laguncularia racemosa)* in the surrounding upper brackish mudflats. This root architecture provides a unique brackish-water nursery environment while serving as a massive biological filter that traps inland sediment and mitigates nutrient loads before they can discharge onto the south coast coral reefs. Additionally, Graeme Hall functions as an essential regional sanctuary and stopover point for both resident and migratory waterbirds. It serves as a vital nesting and roosting site for species such as the Little Egret *(Egretta garzetta)*, the Cattle Egret *(Bubulcus ibis)*, and various migratory shorebirds and teals traveling along the Atlantic flyway *(Hutt M. , 1975)*. Historically, the GHS still represents one of the island's most significant biodiversity hotspots and remains an important ecological receptor despite the surrounding urban development.

6.7.6.1. The critical importance of the Graeme Hall Swamp

According to the *IDB (2015),* in identifying a critical natural habitat, it is required to evaluate the presence of critical natural habitats in the area of influence of the project against the criteria for such habitat described in the environment and safeguards compliance policy. Critical natural habitats are distinguished by the following:

- It may be an existing protected area, an area officially proposed by a government for protection, and/or a site that maintains conditions that are vital for the viability of the environment.
- An unprotected area of known high conservation value.
- An existing protected area that may include reserves that meet the criteria of the IUCN Protected Area Management Categories I through VI; World Heritage Sites, areas protected under the RAMSAR Convention on Wetlands; core areas of World Biosphere Reserves; areas in the UN List of National Parks and Protected Areas.
- An area of known high conservation value are sites that may be: (i) highly suitable for biodiversity conservation; (ii) crucial for critically endangered, endangered, vulnerable or near threatened species listed as such in the IUCN Red List of Endangered Species; and (iii) critical for the viability of migratory routes of migratory species.

Due to the features of the GHS, the wetland was designated as a *Ramsar Site* on 12 December 2005 denoting a Wetland of International Importance under the Ramsar Convention on Wetlands *(Ramsar Convention on Wetlands, 2006)*. The Convention on Wetlands, signed in Ramsar, Iran, in 1971, is an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. The Convention promotes the conservation of wetlands and their resources through the concept of "wise use". Wise use basically means making use of a wetland in a sustainable way so that it may yield the greatest continuous benefit to present and future generations *(Williams A. , 2008)*.

The Ramsar designation was awarded, based on three of the eight Ramsar criteria as follows *(Ramsar Convention on Wetlands, 2006)*:

- **Criterion 1:** A wetland should be considered internationally important if it contains a representative, rare, or unique example of a natural or near-natural wetland type found within the appropriate biogeographic region: "*Graeme Hall Swamp … is the last remaining complete ecosystem of its type left in Barbados and has the largest body of inland water on the island (4.86 ha lake in addition to wetland area). It also contains the largest remaining area of red mangrove (Rhizophora mangle) and white mangrove (Laguncularia racemosa) forest. It is the only location on the island where a mangrove forest, a seagrass bed, and a shallow nearshore hard coral reef can be found in close proximity to each other (Ramsar Convention on Wetlands, 2006)*.
- **Criterion 2**: A wetland should be considered internationally important if it supports vulnerable, endangered, or critically endangered species or threatened ecological communities: "The *presence of the peregrine falcon (Falco peregrinus), listed in CITES Appendix I, has been recorded in the Swamp*." *(Ramsar Convention on Wetlands, 2006)*
- **Criterion 4**: A wetland should be considered internationally important if it supports plant and/or animal species at a critical stage in their life cycles or provides refuge during adverse conditions: "*At least eighty-four (84) bird species have been recorded at the Sanctuary, which is home to the widest diversity of resident and migratory birds on the island, including locally threatened species such as the yellow warbler (Setophaga petechia, formerly Dendroica petechia). The oldest nesting colony for the snowy egret (Egretta thula) is at the swamp, as is the first known breeding colony of Little Egret (Egretta garzetta) to become established in the Americas*." *(Ramsar Convention on Wetlands, 2006)*

In total, the GHS incorporates six different Ramsar wetland types:

- Coastal brackish/saline lagoons (Marine/coastal wetlands Ramsar type J)
- Intertidal forested wetlands (Marine/coastal Ramsar type I)
- Freshwater, tree-dominated wetlands (Inland wetlands Ramsar type Xf)
- Shrub-dominated wetlands (Inland wetlands Ramsar type W)
- Water storage area (Human-made wetlands Ramsar type 6)
- Canals and drainage channels, ditches (Human-made wetlands Ramsar type 9)

The site is officially located in Christ Church at coordinates: 13°04'N 59°34'59" W with an area of 33 ha. The 84 bird species that have been recorded, include Caribbean coot (*Fulica caribaea*) and yellow warbler (*Setophaga petechia*, formerly *Dendroica petechia*), while the site's red mangrove (*Rhizophora mangle*) and white mangrove (*Laguncularia racemosa*) stands are the largest healthy mangrove areas left on the island. There are 26 fresh and brackish water fish species, among the most interesting of which are those marine species that have become isolated from the sea and become breeding residents of the lake. Fishing has been suspended pending study of the effect of the water quality on human consumption of fish and the effects on fish populations of the introduction of aggressive tilapia species. Ecotourism and environmental educational and research activities are the chief human uses of the site, which has been proposed as a National Heritage Site *(Ramsar Convention on Wetlands, 2005)*. *The location of GHS relative to the site is shown at Figure 40*.



Figure 41: Topographic Map highlighting the location of the Graeme Hall Swamp[38]

(Williams A. , 2008) outlines the legal obligations to conserve the GHS, which, when followed, will ensure that all safeguards are in place during this project's execution. They are listed as follows:

- **Ramsar Convention**: A designation that makes Barbados eligible to access and receive some of the financial and non-financial benefits from accession to the Convention19;
- **Convention on Biological Diversity (CBD)**: emphasizing conservation and sustainable use;
- **Convention on International Trade in Endangered Species (CITES):** which ensures that such trade does not threaten the survival of the species;
- **Protocol on Specially Protected Areas and Wildlife (SPAW)**: assists Caribbean Governments in protecting rare and fragile ecosystems within the implementation of the CBD
- **Protocol on Land-based Sources of Marine Pollution (LBS)**: directed at (among other) domestic wastewater sources of marine pollution and its impact on fisheries and tourism;
- **Barbados National Physical Development Plan**: which designated Graeme Hall as a *Natural Heritage Conservation Area;*
- **National Biodiversity Strategy and Action Plan (NBSAP):** which specifically mentions the Graeme Hall Swamp and its environs;

[38] UWI. 2025. Graeme Hall Swamp Review. Accessed at https://www.cavehill.uwi.edu/cermes/wp-content/uploads/sites/38/Docs/Technical_Reports/Mahon_et_al_2025_Graeme_Hall_Swamp_Review_CTR_110.pdf (Mahon et al., 2025)

- **Coastal Zone Management Act and Plan (CZMA & CZMP):** which seeks to establish the Graeme Hall Swamp as a Biodiversity Reference Area; and
- **Marine Pollution Control Act (MPCA):** enacted to prevent, reduce, and control pollution of the marine environment from whatever source.

The protection of habitat, monitoring of changes in the coastal zone, and the preservation of wetlands are all activities undertaken by the Graeme Hall Nature Sanctuary, which can be used by the Government as evidence of its intention to honor its international obligations *(Williams A. , 2008)*. The landscape features of this site include the following *(Williams A. , 2008)*:

- The largest remaining areas of red (*Rhizophora mangle*) and white (*Avicennia racemosa*) mangroves.
- Red mangroves dominate much of the lake shoreline, although white mangroves dominate the northeastern shore.
- The largest body of inland water in Barbados.
- The swamp serves as a central drainage point of a 1,158-acre watershed area.
- In previous times, the mangrove wetland, seagrass bed, and shallow nearshore hard coral reef ecosystems interacted with each other as one large ecosystem.
- Currently, a narrow sluice gate connects the Swamp to the marine area.
- A network of man-made drainage canals has been constructed, where the banks of these canals support a dense growth of sedges and strips of grasslands.

The Biotic and non-Biotic features include the following *(Williams A. , 2008):*

- At least 44 bird species, including locally threatened species such as Caribbean coot (*Fulica caribaea*) and yellow warbler (*Setophaga petechia*, formerly *Dendroica petechia*).
- Roost area for migratory and native water birds, one of only three primary roost areas in Barbados within the Eastern Caribbean Flyway.
- The oldest nesting colony for the snowy egret (*Egretta thula*) is at the swamp, as is the first known breeding colony of Little Egret (*Egretta garzetta*) to become established in the Americas.
- A wide variety of fish, crustacean, bird and mammalian species inhabit the swamp.
- More than 20 fresh and brackish water fish species, among the most interesting of which are those marine species that have become isolated from the sea and become breeding residents of the lake.
- Other species include the green monkey (*Chlorocebus aethiops*), mongoose (*Herpestes javanicus*), fisherman bat (*Noctilio leporinus*), several herptile species, a wide diversity of invertebrate life and aquatic life

Further, the GHS is identified as a Natural Heritage Conservation Area. *(Wolf, 2004)* outlines the purpose of this designation is to:

- conserve and enhance the environmental quality and visual integrity of sites of ecological and geological importance;

- ensure that new development is compatible with the natural heritage and landscape qualities of these areas;
- define and protect a functionally connected natural heritage system based on an ecosystem approach; and
- The designation established the importance of the Graeme Hall Ecosystem in the social and economic life of Barbados. The Physical Development Plan (Amended 2003) recognizes that *"Barbados near-shore marine ecosystem is one of its most important natural resources and provides the major tourism and recreational attraction for the island." (Potter & Phillips, 2004)*.

Additionally, the GHS also has the designation of being a "Nature Sanctuary". The "Nature Sanctuary" is an owner-applied designation that signals the purpose of the acquisitions and infrastructure work conducted by the Graeme Hall Nature Sanctuary Inc., namely, the conservation of the Wetlands of Graeme Hall. "As part of its mission in the Caribbean, GHNS is facilitating the preservation of 34.25 acres of Graeme Hall Swamp in one of the most densely populated areas of the island. Residential and commercial tourism development surrounds the swamp along the southern, eastern, western, and northwestern boundaries, a main coastal road (Hwy 7) runs between the swamp and the sea on the south side, and agricultural lands border the swamp along the northeastern side" *(Brown, 2008)*. This designation broadens the "conservation commitment" of GHNS to the wider ecosystem. GHNS is a private investment that is creating public value.

6.7.6.2. Value of Graeme Hall wetlands

An initial assessment of the total value of the Graeme Hall Nature Sanctuary was conducted by Williams in a 2008 study titled, *"The Wetlands of Graeme Hall: An Initial Assessment of Value"*. The goal was to assess the value of GHNS in terms of its infrastructure, its services, its contribution to the conservation of the Wetlands and buffer zone, and by extension, the Southwest Coast community and the national economy. The study objectives included: a value assessment of the physical assets of the Graeme Hall Nature Sanctuary; a socio-economic assessment of the functions and uses of the wetlands landscape at Graeme Hall; and a perspective on maintaining this natural asset as a legacy to future generations of Barbadians.

The value assessment was designed as a non-intrusive inquiry into the characteristics and functions of the Graeme Hall Nature Sanctuary. It comprised predominantly of desk research and relied exclusively on data and information that already exists in the public domain. The activities included *(Williams A. , 2008):* Document Review, Scoping Visit to GHNS, Value Assessment of GHNS Infrastructure, Assessment of Social and Economic Value of the Wetlands Landscape, and Projections of the potential Legacy Welfare benefits

The study identified 12 valuable functions of the wetlands at Graeme Hall. These include (Williams A. , 2008): Habitat; Refuge; Regulating Hydrological Flows; Storage and retention of water; Hosting unique biological material; Capacitance and absorption of pollutants; Removal or breakdown of excess compounds; Maintaining ecological characteristics of the landscape; Monitoring coastal zone changes; Impacting local community quality of life; Providing cultural attraction and being a repository of scientific information.

Using various valuation methods, the study made an initial value of the Graeme Hall Wetlands at US$551,288,300 (Williams A. , 2008). Those details are outlined in Table 36.

Table** 36**: Total Value of Graeme Hall Wetlands

WETLAND SERVICES	WETLAND VALUE	VALUE METHOD	ESTIMATE
Wetland Conservation Values	GHNS Replacement Value	Replacement Cost	$ 23,635,520
	Buffer Zone Value	Real Estate Market Prices	$ 6,048,000
Heritage Cultural Landscape Values	Tourism Sector Support	Proportionate Tourist Expenditure Estimates	$105,736,000
Wetland Emergency Avoidance	Risk Aversion	Avoidance Cost - Market Price	$173,000,000
CARICOMP Monitoring	Disaster Preparedness	-	-
Biodiversity	Quality of Life Support – South coast community	Shadow-value: Net Factor Income	$242,868,780
		Total Value Estimate	$551,288,300

The true meaning of the magnitude of these valuations is not simply that natural resources like the Graeme Hall Wetlands are being undervalued; rather, it is an identification of the weight in the decision-making process that must be given to the Graeme Hall Wetlands that produce these services, otherwise current and continued future human welfare may drastically suffer *(Williams A. , 2008)*.

6.7.7. Ecosystem services of the Program area

Ecosystem services are the benefits that people obtain from ecosystems. In accordance with IDB Environmental and Social Performance Standard (ESPS) 6, this section identifies ecosystem services associated with the area in which the Program will be constructed and operated, including the plant upgrade, the reclamation facility and the Workers' Campsite, distinguishing those arising within the direct Area of Influence from those arising within the Indirect Area of Influence (AOI), prioritizes them, and provides an indicative economic valuation where the available evidence supports one.

The assessment is a non-intrusive desk-based inquiry relying on publicly available information and is consistent with the method used by *Williams (2008)*. It is supplemented by field observations recorded during the Rapid Biodiversity Assessment conducted between 14 and 17 April 2026. No primary ecosystem service valuation study was undertaken. Services are considered within the provisioning, regulating, cultural and supporting categories of the Millennium Ecosystem Assessment. Table 37 shows a summary of ecosystem services corresponding to the direct AOI and indirect AOI. These services are further explored in this sub-section.

Table** 37**: List of ecosystem services categorized according to Millenium Ecosystem Assessment categories, AOI and descriptions

Ecosystem Service	MEA Category	AOI (Direct or Indirect)	Description
Soil retention and erosion control	Regulating	Direct AOI	Grassland and shrub vegetation help stabilize soils and reduce erosion within the campsite footprint.
Rainfall infiltration and groundwater recharge	Regulating	Direct AOI	Vegetated surfaces facilitate localized infiltration of rainfall and contribute to groundwater recharge.
Dust and noise attenuation	Regulating	Direct AOI	Existing vegetation provides limited attenuation of dust and noise generated by surrounding activities.
Microclimate regulation	Regulating	Direct AOI	Vegetation contributes to localized shading and minor temperature moderation.
Habitat, forage and cover for terrestrial fauna	Supporting	Direct AOI	The site provides habitat and foraging opportunities for fauna recorded during the Rapid Biodiversity Assessment.
Vegetated buffer function	Supporting	Direct AOI	Vegetation provides a buffer between the South Coast Sewage Treatment Plant and surrounding agricultural lands.
Provisioning services	Provisioning	Direct AOI	No significant provisioning services were identified. The site is not cultivated and is not used for grazing, harvesting or water abstraction.
Cultural, recreational, heritage or spiritual values	Cultural	Direct AOI	No recorded amenity, recreational, heritage or spiritual use; public access is absent.
Habitat for resident and migratory birds	Supporting	Indirect AOI	Supports roosting and breeding of red seal coots, sandpipers, egrets and other avifauna.
Refuge function for migratory species	Supporting	Indirect AOI	Provides refuge and stopover habitat for resident and transient bird populations on the Eastern Caribbean Flyway.
Hydrological regulation	Regulating	Indirect AOI	Regulates watershed drainage and moderates hydrological flows within the catchment.
Water storage and retention	Regulating	Indirect AOI	Stores and retains water within the wetland and associated aquifer system.
Mangrove genetic resources	Provisioning/ Supporting	Indirect AOI	Supports unique biological and genetic resources associated with white and red mangrove communities.

Ecosystem Service	MEA Category	AOI (Direct or Indirect)	Description
Pollutant absorption and runoff regulation	Regulating	Indirect AOI	Absorbs pollutants and regulates sediment- and contaminant-laden runoff entering the wetland.
Waste treatment and nutrient processing	Regulating	Indirect AOI	Provides emergency wastewater treatment capacity through the removal and breakdown of excess compounds.
Wetland maintenance and conservation support	Supporting	Indirect AOI	Supports conservation management through national and international wetland protection obligations.
Climate and coastal change monitoring	Cultural/ Supporting	Indirect AOI	Functions as a monitoring site for coastal environmental change under the CARICOMP program.
Landscape and heritage value	Cultural	Indirect AOI	Contributes to landscape character, quality of life, and the environmental setting of the area.
Recreation and tourism	Cultural	Indirect AOI	Provides recreational, tourism and visitor opportunities associated with the wetland environment.
Education and scientific research	Cultural/ Supporting	Indirect AOI	Supports environmental education, scientific research and ecological monitoring.

Ecosystem Services within the Direct Area of Influence (DAI)

The proposed Workers' Campsite footprint in the DAI (500 m physical pathway area) occupies approximately 6,592 m^2 of grassland and shrub vegetation accessed via an earthen dam. The land is not cultivated and does not contain surface water features.

Regulating services provided by the area include soil retention and erosion control through vegetative cover, localized rainfall infiltration and groundwater recharge, attenuation of dust and noise, and minor microclimatic regulation. Supporting services include the provision of habitat, forage, and cover for terrestrial fauna as recorded during the Rapid Biodiversity Assessment, as well as the maintenance of a vegetated buffer between the South Coast Sewage Treatment Plant and surrounding agricultural lands. No significant provisioning services were identified in the area, nor does the site possess any recorded amenity, recreational, heritage or spiritual use. There is also no public access.

At the broader landscape scale, the dominant provider of ecosystem services within the indirect AOI is the Swamp itself Williams (2008) identified a diverse range of ecosystem functions and services associated with the wetland, including habitats supporting the roosting and breeding of red seal coots, sandpipers and egrets, refuge for resident and transient bird populations on the Eastern Caribbean Flyaway for birds, regulation of hydrological flows, water storage and retention, hosting of white and red mangrove genetic resources, absorption of pollutants and regulation of upland runoff, emergency wastewater treatment functions through removal or breakdown of excess compounds, support for wetland conservation and maintenance, function as a monitoring site for adjustment in the coastal zone

to global change under the CARICOMP project, landscape and cultural heritage values, recreation and tourism, and educational and scientific research opportunities.

These services contribute significantly to the ecological functioning of the area and underpin the environmental importance of the Graeme Hall Swamp.

Priority Ecosystem Services

Applying the ESPS 6 test, the following ecosystem services are considered priority ecosystem services for the Workers' Campsite because the project either influences their condition or depends on them:

Pollutant absorption and waste treatment functions of the GHS. The wetland provides capacity for the attenuation and processing of pollutants entering the catchment and serves as an emergency buffer within the South Coast wastewater management system. Any failure in camp sanitation, or any overloading of the plant during the construction period, is transmitted directly to this service. As campsite wastewater will enter the same treatment network, the Project both depends upon and may influence this service.

Water quality regulation and pollutant retention. Surface runoff from the campsite has the potential to enter drainage pathways connected to the wetland. Consequently, the Swamp's capacity to retain sediments, nutrients, hydrocarbons, and other contaminants represents a key ecosystem service receptor.

Hydrological regulation. Hard standing, compaction and drainage works at the campsite alter the rate and timing of runoff reaching the watershed drainage network.

Habitat and refuge functions. Vegetation clearance at the footprint removes habitat and forage for the fauna recorded during the Rapid Biodiversity Assessment, and camp lighting, noise and human presence may affect roosting and transiting avifauna using the Swamp. The significance of this effect cannot be fully determined until the Critical Habitat Assessment required by the Project Execution Unit and the IDB safeguards team has been completed.

Soil retention and infiltration services within the campsite footprint. These services are under direct Project control and are lost on clearance, to be reinstated through the Habitat Restoration Plan at decommissioning.

Other ecosystem services identified by *Williams (2008)* associated with the GHS, including landscape heritage, cultural attraction, the CARICOMP monitoring function and the information repository function, are not assessed as priority services for this project as the campsite neither controls them nor materially affects their condition, and no project activity is dependent upon them. However, they are still recorded here given their contribution to the significance of the Swamp as a receptor in the Impact Assessment chapter.

Economic Value

Williams (2008) estimated the total economic value of the Graeme Hall Wetlands at approximately US$551.3 million, using a combination of replacement cost, avoidance cost, proportionate tourist expenditure, real estate market prices, and shadow-value approaches, shown in Table 36. This estimate relates to the wetland system as a whole and is presented here as context for the scale of the receptor within the Indirect AOI, and it is not apportioned to the Workers' Campsite; the campsite occupies no

part of the wetland, and attributing any share of that figure to a 6,592 m^2 footprint of dry scrub grassland would not be defensible.

For the DAI, no published unit values exist for Barbadian dry scrub grassland of this extent and condition. Where the Critical Habitat Assessment is subsequently commissioned, the ecosystem services identified in this section should be revisited against the primary data it generates, and valued at that point if the data support it. The prioritization above should be treated as provisional until that assessment is complete.

The priority ecosystem services identified in this section are carried forward as receptors in the Impact Assessment chapter, and the measures addressing them are set out in the Management Plan.

6.7.8. Biodiversity assessment of the workers' campsite project area

A Rapid Biodiversity Assessment (RBA) was conducted during the period April 14 to 17, 2026, in and around the area of the proposed campsite. This was done to record biodiversity species observed within the Workers' Campsite and the surrounding environs. The study area encompasses the Workers' Campsite area, as well as the entire existing treatment plant area and the new proposed project site, which falls within the direct 500km radius of the Area of Influence (AOI). To accurately capture the baseline biophysical conditions of the project area, the spatial boundary for the biodiversity inventory cannot be restricted to the immediate physical footprint of the project site. Ecosystems do not operate as closed, static enclaves; rather, they are governed by dynamic processes of ecological connectivity and metapopulation dynamics that function across macro-regional scales, hence the identified area of influence. Confining the assessment to a narrow radius introduces a significant risk of underrepresenting ecological dependencies due to two primary biological mechanisms:

- **Faunal Mobility and Trophic Ranges:** Highly mobile terrestrial and marine fauna, including migratory avifauna utilizing regional flyways, marine reptiles (such as nesting sea turtles), cetaceans, and pelagic ichthyofauna, possess extensive home ranges and seasonal migratory pathways. Meaning, various fauna populations may reside directly in the project area, as well as the environs of the DAI.
- **Floral Dispersal and Colonization Dynamics:** Plant communities expand, propagate, and colonies open niches via macro-scale dispersal mechanisms such as wind (anemochory), water currents (hydrochory), and animal vectors (zoochory). In tropical coastal and marine environments where favorable climatic factors allow for rapid growth and opportunistic establishment, plant propagules routinely bridge substantial geographic distances, maintaining vital genetic flow between seemingly isolated habitats.

Because localized impacts cannot be decoupled from wider regional environmental dynamics, this RBA will include species observed and/or researched to be present in the stated direct AOI, spanning the 500 m direct Area of Influence. It should also be reiterated that this study is not a Critical Habitat Assessment, and the techniques used for that type of assessment will not be applied to this RBA. The techniques referenced here are strictly for a RBA exercise, and the results herein reflect the scope of the RBA activity. Therefore, any noted lacking nuance may apply to a Critical Habitat Assessment or another such exercise, which is beyond the scope of this RBA. To focus on the immediate project zone, the following sub-transects were assessed (also see Map 4):

1) In front of the existing Treatment Plant and primary entrance to the Workers' Campsite *(GPS: 21P 0221145, UTM 1446448)*

2) At the back of the existing SCSTP *(GPS: 21P 0220928, UTM 1446597)*

3) GHS swamp at the side of (adjacent to) the existing SCSTP *(GPS: 21P 0220965, UTM 1446544)*

4) Northern side of workers campsite and proposed site for new treatment plant *(GPS: 21P 0221316, UTM 1446738)*

5) Northwestern side (back) of workers campsite and proposed site for the new treatment plant *(GPS: 21P 0221063, UTM 1446909)*

6) Southwestern side (back) of workers campsite and proposed site for the new treatment plant *(GPS: 21P 0220936, UTM 1446672)*

The objective of the RBA was to establish a primary baseline dataset for terrestrial flora and fauna to satisfy the requirements of IDB ESPS 6. A mix of random and targeted sampling was used to capture overall diversity and detect rare species. This baseline acts as a foundational component of the project's ESIA. It provides the necessary data to apply the Mitigation Hierarchy (avoid, minimize, restore, and offset) and to determine whether the affected ecosystems constitute Modified, Natural, or Critical Habitats as defined by the IDB.

In alignment with the IDB Guidance for Assessing and Managing Biodiversity Impacts, the rapid assessment approach was deployed to optimize field efficiency and identify time-sensitive conservation priorities. Rather than executing an exhaustive multi-year inventory, field operations focused on documenting key indicator species, assessing structural habitat characteristics, and evaluating priority Ecosystem Services to identify biological hotspots and sensitive natural resources.

Scoping and determining the Ecologically Appropriate Area of Analysis (EAAA) for the RBA was also carried out. Field investigations utilized a combination of random and targeted sampling to capture representative biodiversity and maximize the detection probability of rare, threatened, endemic, or legally protected species. Data collection was executed through two primary field mechanisms: transect sampling done by walking designated lines primarily along the defined boundaries of the project site and different habitat types, recording observations (e.g., visual sightings), and using non-destructive methods such as photography; and to safeguard against sampling bias, random sampling was done by extending inward from the boundaries into the core project interior. The precise configuration of this random sampling was adapted based on real-time field variations in vegetation communities and shifting flora assemblages. Species locations identified were done in proximity to the identified GPS location points detailed in the previous section.

The vulnerability of these species was compared against the International Union for the Conservation of Nature (IUCN) Red List conservation status (https://www.iucnredlist.org/). The IUCN Red List Categories and Criteria are intended to be an easily and widely understood system for classifying species at high risk of global extinction.

It divides species into nine categories: **Not Evaluated**, **Data Deficient**, **Least Concern**, **Near Threatened**, **Vulnerable**, **Endangered**, **Critically Endangered**, **Extinct in the Wild** and **Extinct**. See Figures 42 and 43 for more details. For reference, when 'Not Evaluated' is mentioned in the upcoming discussions and tables, it will refer to flora or fauna not formally assessed per IUCN criteria.

"Not Evaluated is used for taxa that have not been formally assessed under the IUCN Red List Categories and Criteria. This can occur because the species is newly described, data have not yet been compiled for an assessment, priorities have focused on other groups or regions, or an assessment is planned but not completed. NE is therefore a status about the assessment process, not a statement about population size, trend, threats, or extinction risk" (International Union for Conservation of Nature, 2024).

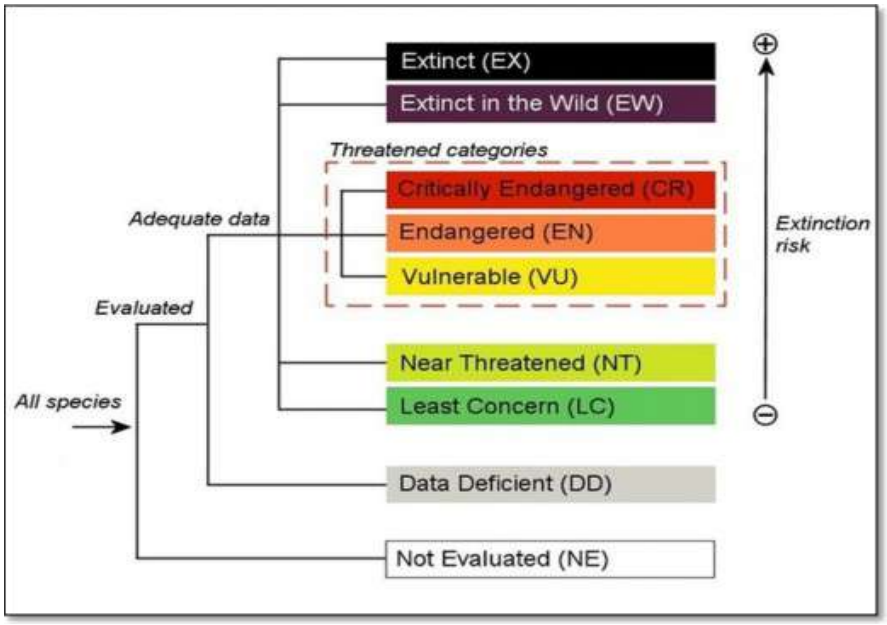


Figure 42**: The IUCN Red List Categories © International Union for Conservation of Nature**[39]

The IUCN Red List categories used throughout this section, and their definitions, are reproduced at Figures 42 and 43.

[39] IUCN. Red list Accessed at https://www.iucnredlist.org/https://www.iucnredlist.org/ (International Union for Conservation of Nature, n.d.)

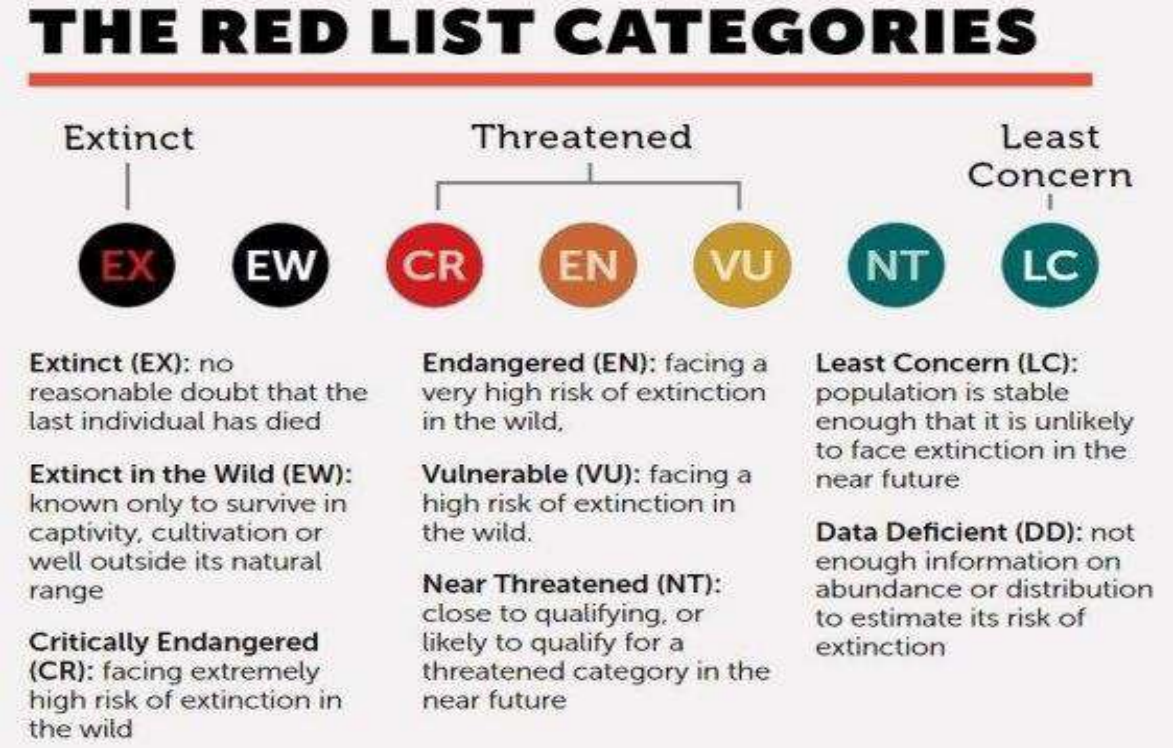


Figure *43*: The IUCN Red List Categories Explained © International Union for Conservation of Nature[40]

6.7.9. Critical Habitat and Field Verification

The Program is located within a highly modified but environmentally sensitive landscape. Of particular importance is the proximity of the existing treatment plant and proposed Project activities to the **Graeme Hall Swamp**, which forms part of the GHS Ramsar Site (Ramsar Sites Information Service, 2005). The wetland provides habitat for resident and migratory species and is influenced by hydrological connections between the surrounding catchment, groundwater, wetland system and adjacent coastal environment. The ecological sensitivity of the area, together with the nature and scale of the proposed infrastructure, requires careful consideration of potential risks and impacts to biodiversity and ecosystem functions.

Field verification was undertaken on 21, 24 and 28 August 2026 as part of the Critical Habitat Assessment to confirm the ecological condition and hydrological connectivity of the Graeme Hall wetland system in relation to the Barbados Climate Resilient South Coast Water Reclamation Project. The verification exercise was conducted at seven stations and provided current evidence of habitat status, drainage pathways and existing pressures. Accessible portions of the wetland were assessed as Moderate to Good, with an established mosaic of marsh, mangrove and open-water/canal habitats, mature red and white mangroves, and marsh vegetation and standing water remaining present. Localized degradation was also recorded, including hurricane-related mangrove damage, illegal dumping and existing infrastructure/urban influence. The Nature Sanctuary (station FV-05) could not be accessed in time for the August exercise due to the inability to secure the necessary landowner access permissions.

6.7.9.1. Project Location and Components Relevant to the CHA

[40] IUCN. (n.d.) Red list. Accessed at https://www.iucnredlist.org (International Union for Conservation of Nature, n.d.)

The SCSTP is located at Graeme Hall, Christ Church, within a substantially developed landscape containing residential, commercial, agricultural and transport infrastructure. Historical assessments similarly describe the wetland as embedded within a mixed land-use setting comprising residential development, tourism-related commercial uses, agricultural lands and major transport infrastructure, with surrounding land uses influencing drainage and other inputs to the wetland system (Williams A. , 2008).

Not all Project components are equally relevant to Critical Habitat. The CHA therefore focuses on activities for which a plausible pathway exists to a Key Biodiversity Feature (KBF), including potential changes in water quantity or quality, groundwater interactions, drainage, accidental releases, habitat disturbance, noise or other construction-related disturbance. Infrastructure outside the immediate Graeme Hall area is considered where such an ecological connection can reasonably occur. Specific Project–KBF interaction pathways are assessed in Section 7.

6.7.9.2. Graeme Hall Swamp and its Conservation Context

GHS is a coastal wetland in Christ Church and Barbados' only Wetland of International Importance under the Ramsar Convention. The Ramsar site, designated in December 2005, encompasses approximately 33 ha and forms part of a wider ecological landscape that includes wetland habitats and adjacent coastal and marine systems.

A more recent national assessment confirms the particular conservation importance of Graeme Hall. The 2023 *Barbados National Wetland Inventory* identifies it among Barbados' nationally important wetlands and documents its ecological character, water regime, habitats and biota, changes in ecological character, ecosystem services, pressures and management context. This recognition has a longer planning history. Williams (2008) documents the Ramsar designation, identification of Graeme Hall as a Natural Heritage Conservation Area under the then Physical Development Plan, and earlier proposals for a wider national park and watershed-management approach. The National Wetland Inventory similarly notes that the wider GHS, beach, seagrass bed and reef ecosystem has previously been recognized through national land-use planning as an environmentally sensitive terrestrial and marine system.

Graeme Hall comprises lands under both private and public ownership and contains a mosaic of mangrove, open-water and other wetland and terrestrial habitats supporting aquatic organisms and resident and migratory birds (Mahon, et al., 2025; Mahon, 2023). The Ramsar designation and other conservation designations provide important evidence of recognized biodiversity significance.

6.7.9.3. Hydrological and Coastal/Marine Setting

Graeme Hall is not an isolated wetland. Available studies describe a wider watershed and groundwater-influenced system with historical hydrological connections between the swamp and the adjacent marine environment. Mahon et al. (2025), drawing together several decades of investigations, specifically considers the Graeme Hall watershed, wetland hydrology and limnology, connection to the sea, and adjacent marine environment as interconnected elements of the system. Earlier assessments similarly place the wetland within the approximately 1,158-acre Graeme Hall watershed and recognize the importance of the surrounding floodplain and buffer areas to drainage and maintenance of wetland ecological character (Williams A. , 2008).

The wetland–marine connection has been substantially modified by development. Williams (2008) reports that construction of Highway 7 along the coastal sand bar effectively removed the former direct

natural connection between the wetland and sea, leaving a sluice-controlled drainage connection. Subsequent studies document how the management and condition of this connection have influenced water levels, salinity, flushing, and ecological conditions within the wetland (Mahon, et al., 2025). Historically, the mangrove wetland, adjacent seagrass beds and shallow nearshore reef functioned as more closely connected components of the coastal ecosystem (Williams A. , 2008). The 2023 National Wetland Inventory similarly recognizes the swamp, beach, seagrass bed and reef as components of a wider environmentally sensitive system.

Exchange between the swamp and sea has historically occurred through a drainage channel and sluice arrangement, the management and condition of which have influenced water levels, salinity and ecological conditions within the wetland. Field investigations undertaken in 2010 documented a substantial decline in wetland salinity and associated changes in mangrove and aquatic community characteristics following reduced seawater exchange, providing direct evidence of the ecological importance of maintaining the wetland's hydrological and salinity regime (Environmental Engineering Consultants, 2010).The adjacent marine environment contains seagrass and coral reef habitat and provides habitat for marine fauna of conservation interest.

These relationships are important to the CHA because the ecological area potentially influenced by the Project cannot necessarily be defined by the physical footprint of the SCSTP or the administrative boundary of the Ramsar site. The assessment consequently considers plausible surface-water, groundwater and ecological connections between Project activities, Graeme Hall and downstream coastal and marine receptors.

6.7.9.4. Existing Environmental Pressures and Ecological Change

Graeme Hall has undergone substantial historical modification and continues to experience multiple environmental pressures. The available evidence identifies altered drainage and hydrological connectivity, water-quality concerns, sewage inputs, changes in salinity and water exchange, invasive or introduced species, and pressures associated with surrounding urban, agricultural and infrastructure development (Environmental Solutions Ltd., 2024; Mahon, et al., 2025). These pressures have a long-documented history. Williams (2008), drawing on the 2007 Graeme Hall Master Plan, records a 2005 incident in which raw sewage was redirected from the South Coast Sewage Treatment Plant into the wetland rather than through the designed emergency marine outfall. This provides historical evidence of a direct wastewater–wetland interaction pathway, although it should not be interpreted as evidence of current operating practice. The 2025 review similarly documents both the long history of physical modification of the swamp and the continuing interaction between the SCSTP and the Graeme Hall system.

The National Wetland Inventory also records changes in ecological character and identifies restoration of water quality, hydrological exchange and ecological condition as longstanding management priorities. Previous recommendations have included monitoring of water quality, fish communities (including Atlantic Tarpon, Common Snook, White Mullet and Mangrove Rivulus) and mangrove habitats (Red, White and Black Mangrove, and Buttonwood/Button).

These existing pressures are relevant to establishing present ecological condition and interpreting cumulative effects, but do not diminish the conservation significance of remaining biodiversity features. The CHA therefore distinguishes, to the extent supported by available evidence, existing or historical pressures from effects plausibly attributable to the Program.

6.7.10. Plant diversity – flora

6.7.10.1. Vegetation within the workers' camp area

This section outlines a visual representation of the flora species observed within and at the boundaries of the Program area.



Figure 44: Vegetation located on the northern side of the existing Treatment Plant and within the southern side of the new treatment plant project site (GPS Location: 21P 0221023, UTM 1446608)

Most of the proposed Workers' Campsite area is populated by black spear grass (*Heteropogon contortus – Poaceae*), recorded as the primary vegetation cover and flora species within the area, as is shown in Figure 44. According to the IUCN Red List, *Heteropogon contortus* is Not Evaluated (NE), which means that it has not yet been evaluated against the criteria. Not Evaluated (NE) species are not published on the IUCN Red List (https://www.iucnredlist.org/). Sparse clutters of Blackwell switchgrass (*Cenchrus stramineus – Poaceae*), classified as Least Concern (LC) were also observed within that area. Least Concern (LC) defines a tax on when it has been evaluated against the Red List Criteria and does not qualify for Critically Endangered, Endangered, Vulnerable, or Near Threatened. Notably, no critical habitat was observed within the Workers' Campsite area.



Figure 45: Vegetation along the primary access to the Workers Campsite (in front of the existing Treatment Plant (GPS Location: 21P 0221145, UTM 1446448)

Vegetation across the site and its approaches is shown at Figures 45 to 48, covering the primary access, the northern side of the existing treatment plant, the western boundary and the land immediately outside the campsite.



Figure *46*: Vegetation at the northern side of the existing Treatment Plant and at the southern side of the new proposed Treatment Plant (GPS Point: 21P 0221023, UTM 1446608)



Figure 47: Vegetation to the western side (back) of the project site for the Workers' Campsite and the new Treatment Plant (GPS Location: 21P 0221063, UTM 1446909)



Figure 48: Vegetation outside of the Workers Campsite to the northern side of the proposed site for the new treatment plant (GPS Location: 21P 0221316, UTM 1446738)

Since the Workers' Campsite area is very small (approximately 6,592 m^2, or 0.0066 km^2), all flora species were recorded within the proposed area as well as along the primary access, main entrance area, and the immediate boundaries and environs. Species observed are presented in Figures 49 and 50 below. No critical habitat was observed within the Program area.



Figure 49**: Flora photographed within the Workers' Camp site and its immediate environs during the field survey of 14 to 18 April 2026**

The Rough bark lignum-vitae, bottom right, is Endangered and stands on the site itself.

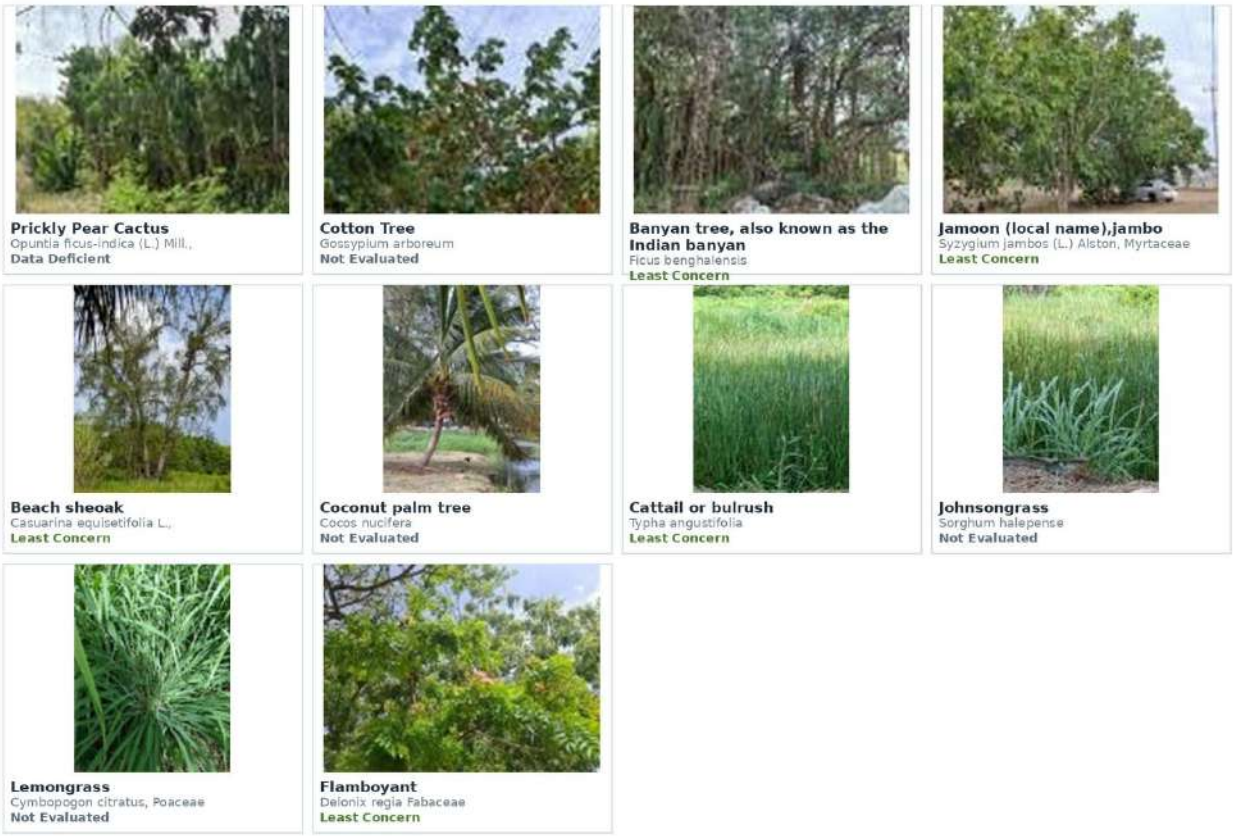


Figure 50**: Vegetation photographed along the principal access route to the site, including cattail and Johnsongrass within the swamp area adjacent to the project**

Based on this assessment, most of the flora diversity was classified as "Least Concern (LC)", which refers to when taxon has been evaluated against the Red List Criteria but does not qualify as Critically Endangered, Endangered, Vulnerable or Near Threatened, and " Not Evaluated (NE)", One specie, the *Opuntia ficus* or Prickly Pear Cactus *(in proximity to GPS location: 21P 0221145, UTM 1446448)*, was "Data Deficient (DD)", which indicates that there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status. A taxon in this category may be well studied, and its biology well known, but appropriate data on abundance and/or distribution are lacking.

One tree, the Roughbark lignum-vitae or tree of life *(Lignum Vitae - Guiacum officinale),* which was labeled and observed just outside of the project area, near the Ministry of Agriculture compound (in close proximity to GPS location: 21P 0221316, UTM 1446738), is noted to be Endangered (EN) according to the IUCN Red List. This is reportedly due to historical overexploitation for its wood and medicinal resin. The West Indian mahogany (*Swietenia mahagoni),* located at the entrance of the existing treatment plant *(in close proximity to GPS location: 21P 0221021, UTM 1446544)*, is considered **Near Threatened** (IUCN 3.1) and is listed under Appendix II of CITES as a species that is considered threatened and may become endangered unless trade is strictly regulated.

The flora of the project area is characterized by a few trees, some shrubs, and mostly perennial grasses. Most of the project area is covered with black spear grass (*Heteropogon contortus).* Castor oil plant, the bellyache bush *(Jatropha gossypiifolia*), these of which are abundantly found on the northern side of the site *(in proximity to GPS location: 21P 0221316, UTM 1446738).* The highest distribution of trees, the Ipil-

ipil *(Leucaena leucocephala)* is also found mainly on the northern boundary of the site *(in close proximity to GPS location: 21P 0221316, UTM 1446738)*. The adjacent swamp area *(in proximity to GPS location: 21P 0221011, UTM 1446463)* is characterized mainly by the cattail or bulrush *(Typha angustifolia)* and the Johnsongrass *(Sorghum halepense)*.

6.7.11. Animal Diversity (Fauna)

6.7.11.1. Birds

No birds or habitat for birds were observed within the Workers' Campsite area, as the area is covered primarily with grass. However, several species were observed within the vicinity of the proposed Workers Campsite, as is illustrated in Figure 51 below. Habitats of the *Quiscalus niger* or Greater Antillean Gracklewere observed in the large tree within the existing treatment plant compound (in proximity to GPS location: 21P 0220979, UTM 1446566). All the bird species observed were classified as "Least Concern (LC)", that is, they have been evaluated against the Red List criteria and do not qualify as Critically Endangered, Endangered, Vulnerable, or Near Threatened. The transect routes walked by the survey team, together with the geographical coordinates at which observations were recorded, are annexed to this ESIA/ESMP so that the survey effort and its spatial coverage can be verified.

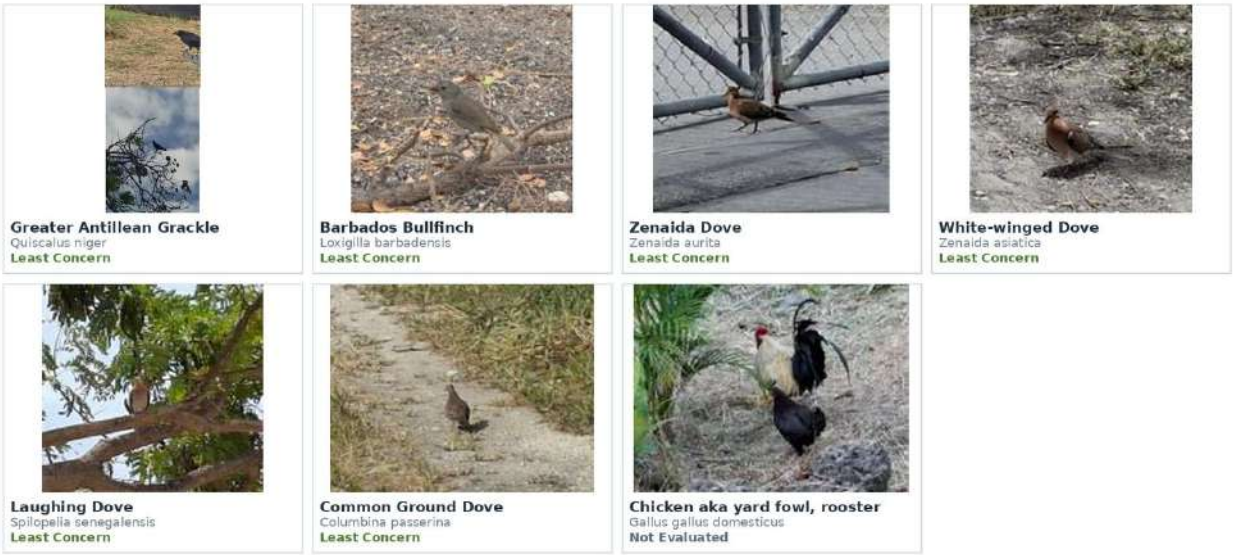


Figure 51: Birds photographed within the Workers' Camp site and its immediate environs. All are assessed as Least Concern; the domestic fowl is not evaluated

Due to the migratory nature of birds and their colony patterns, the data generated highlights several species that frequent the area. This can be used as baseline data for the Workers' Camp project area and environs.

Importantly, Birdlife International has determined GHS to be an Important Bird Area (IBA) *(Burke, 2009b)*. This was partially based on GHS being home to significant populations of four range-restricted species: the green-throated Carib hummingbird (*Eulampis holosericeus*), the Antillean crested hummingbird (*Orthorhyncus cristatus*), the Caribbean elaenia (*Elaenia martinica*), and the endemic Barbados bullfinch (*Loxigilla barbadensis*). It is also known or thought to hold, on a regular basis, at least 1% of the biogeographic population of the little egret (*Egrettagarzetta*) for which GHS is the only documented nesting location in the Western Hemisphere.

Due to the wetland's proximity to the project area and the nature bird movement, it is important to include a list of observed species within the GHS. Graeme Hall Swamp has been noted as an important nesting site for several species of wading birds (Kushlan, 2007). Notables are the little and snowy egrets, which are European and western hemisphere ecological counterparts. Little egrets established a nesting site population at GHS in 1994 (Massiah, Identification of snowy egret and little egret, 1996; Massiah & Frost, The little egrets of Graeme Hall Swamp, 1998), leading to a subsequent comparative study of their feeding ecology (Kushlan, 2007). Kushlan warned of the tenuous nature of the existence of these egrets in GHS if the nesting area is not conserved. Of particular note was the roosting of cattle egrets in GHS in the white mangroves adjacent to the lake (Riven-Ramsey, The cattle egrets and mangroves of Graeme Hall Swamp, 1981; Riven-Ramsey, Foraging and breeding behavior of the cattle egret (Bubulcus ibis) in Barbados, 1988; Krebs, Riven-Ramsey, & Hunte, 1994). Cattle egrets first appeared in Barbados in 1957 and were first seen in GHS in 1972. There were several other roosts in other parts of the island, but the one at GHS was the largest. Details of roosting, nesting, and foraging behaviors of these birds can be found in Riven-Ramsey (1988) and Krebs et al. (1994). Johnson (1986) spent considerable time observing the nesting colony of cattle egrets that was located there. A survey of the Barbados race of the yellow warbler was conducted in March 1997 (estimated to be at the beginning of the nesting season) to establish a population estimate for Graeme Hall Swamp. Based on visual observations and the location and abundance of territorial calls and courtship singing within each habitat type, a conservative estimate is that the swamp provides habitat for approximately 20-40 pairs of yellow warblers (ARA, 1997).

Reed et al. (2018) conducted stable isotope studies on several species of migratory birds in Barbados to determine their area of origin. While they did not collect samples from Graeme Hall Swamp, the species studied have been recorded there. They found that natal origins of juvenile American golden-plover (*Pluvialis dominica*), stilt sandpiper (*Calidris himantopus*), short-billed dowitcher (*Limnodromus griseus*), and lesser yellowlegs (*Tringa flavipes*) were predicted to be mainly from the eastern parts of their breeding ranges in eastern Canada, with American golden-plover, stilt sandpiper, and short-billed dowitcher also having high potential areas of origin in parts of Alaska, USA. The importance of GHS as a habitat for resident and migratory birds was a key consideration in its 2006 designation as a Wetland of International Importance.

The consolidated list of bird species recorded at the Graeme Hall Swamp by earlier studies, principally Hutt (1981), Johnson (1986) and subsequent surveys. It is literature-derived regional context and is not a record of species observed at the campsite. The species observed during the Rapid Biodiversity Assessment of April 2026 are given in the tables above.

6.7.11.2. Fishes

There is no water body within/at the exact proposed location of the Workers' Campsite, and therefore, no fish biodiversity data was recorded from that area. Nevertheless, the nearest waterbody to the camp is the GHS, and historical data is presented as a baseline for the project's fish biodiversity. When a Critical Habitat Assessment is conducted by appropriate specialists, updated information from that exercise may be added to this document for modern reference. However, for this section, the writer will reference historical data collected in the area about the fish population.

There have been several surveys of fish in GHS, with a total of 26 species found. *Johnson (1986)* sampled fish from GHS with a baited trap in the lake and with hand nets in the main canal, the lateral canals, and the canal near its exit to the sea. *Cattaneo et al. (1987)* sampled the fish with a seine, dip net and a minnow trap in the lake and eastern marsh. *Kramer et al. (2007)* also surveyed the fish of GHS using the

same gear, and reported species by three sampling areas in the swamp. They found two species not previously recorded. In 2010, EEC noted that tilapia and tarpon were abundant in the main lake at GHNS.

In 2019, a severe decline in fish biodiversity in the mangrove lake was observed (Environmental Engineering Consultants, 2019b). This was attributed to poor water quality resulting from the high-volume discharge of untreated sewage into the wetland ecosystem (Environmental Engineering Consultants, 2019b). Thirteen locations were sampled in representative habitats (lake, south pond, brackish tray, lily ponds, stormwater ditch) with a variety of fishing gear. The greatest number of species was found in the lily ponds, which were above the impact of the sewage. The only fish species observed in the lake was the Atlantic tarpon. No sign of historically abundant tilapia was observed in the Sanctuary (Environmental Engineering Consultants, 2019b). EEC (2019b) concluded that the present ichthyofauna represents a dramatic change from historical accounts for the Sanctuary.

6.7.11.3. Mammals

Based on this assessment, most of the mammals encountered in the Workers' Camp area are classified as "Least Concern (LC)", that is, they have been evaluated against the Red List criteria and do not qualify as Critically Endangered, Endangered, Vulnerable, or Near Threatened (see Figure 52). Nevertheless, the African green monkey *(Chlorocebus sabaeus)* is listed under Appendix II of CITES as a species that is considered threatened and may become endangered unless trade is strictly regulated. Outlined below are the mammals that were observed in the Workers' Camp project zone.

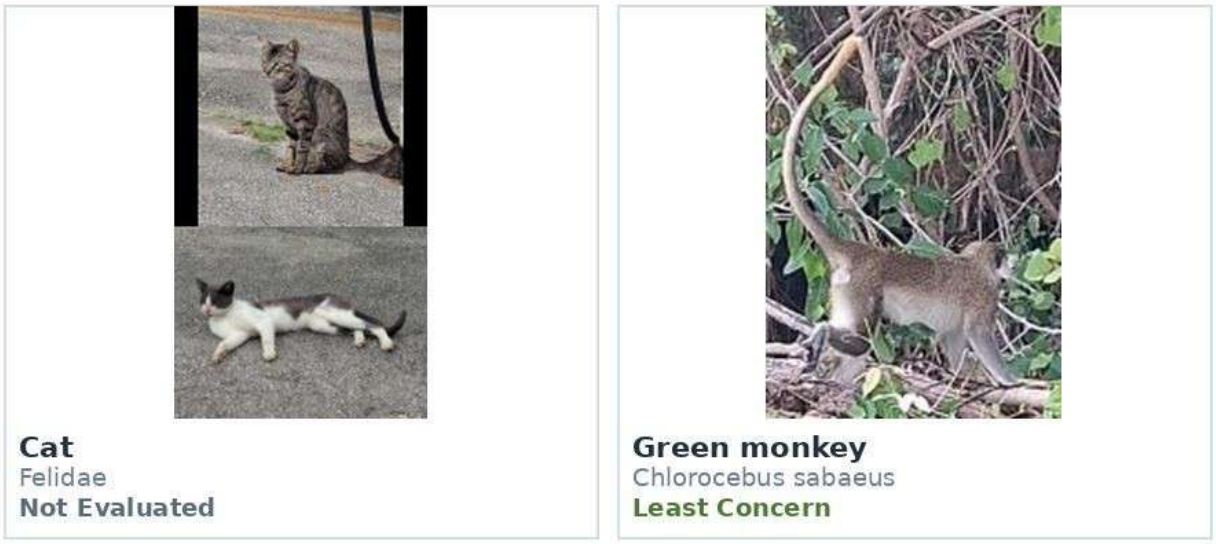


Figure 52**: Mammals photographed within the vicinity of the Workers' Camp. The mongoose and the brown rat were observed but not photographed**

6.7.11.4. Invertebrates

Observed invertebrates in the area are listed as follows (Figure 53):



Figure 53**: Invertebrates and habitats photographed within the project area**

6.7.12. Species of conservation concern

The species inventories above record everything observed. This sub-section isolates the species whose conservation status or ecological function means that an effect on them would be material, and states for each the habitat association through which the project could reach it (see Table 38). It draws on the Graeme Hall Swamp species screening and on CERMES Technical Report No 110.

Table** 38**: Species of conservation concern in the Graeme Hall system

Species	Common name	Status	Presence	Ecological association and relevance
Chelonia mydas	Green turtle	Endangered	Migratory	Uses the seagrass beds of the St Lawrence lagoon, which the swamp feeds. The pathway from the project is water quality in the discharge that reaches the lagoon, not direct disturbance at the camp
Megalops atlanticus	Tarpon	Vulnerable	Migratory	Top predator and keystone species in the Graeme Hall food web. Loss of the top predator restructures the community beneath it, so an effect here propagates rather than remaining local
Fulica caribaea	Caribbean Coot	Near Threatened	Resident; Caribbean regional endemic	Uses the wetland for roosting and breeding. Resident status means it has no seasonal escape from a sustained disturbance
Calidris pusilla	Semipalmated Sandpiper	Near Threatened	Migratory	Uses the wetland for roosting. Exposure is seasonal and concentrated in passage periods
Setophaga petechia	Yellow Warbler	See note	Migratory, with a resident Barbadian form	Uses the wetland for roosting and breeding

Two matters of nomenclature and status should be settled before submission. The Yellow Warbler is recorded in the screening as *Dendroica petechia* with Near Threatened status; the genus *Dendroica* was merged into Setophaga in 2011, and the species is assessed globally as Least Concern, although the Barbadian form is of local conservation interest. The Caribbean Coot is described as endemic, which is correct at the Caribbean regional scale but not at the national scale, and some authorities treat it as a form of Fulica americana rather than a separate species. Both entries should be verified against the current IUCN assessment and the nomenclature stated on that basis.

Four of the above-mentioned five species are recorded in the literature compiled for the Graeme Hall system and appear in the species records at Annex B. The green turtle is the exception. It is not recorded in the field surveys undertaken for this assessment, nor in the literature-derived records for the swamp itself, because the species does not use the wetland: its association is with the seagrass beds of the St Lawrence lagoon, which the swamp discharges into and which lie outside the survey area. It is included here because the pathway from the project to that habitat is water quality in the discharge, and an assessment that surveyed only the wetland would miss it.

This distinction matters for how the species records should be read. The field surveys establish what is present within and immediately around the campsite. Where a species is reached through a water-quality or food-web pathway rather than through direct disturbance, the relevant evidence is the ecosystem condition recorded above, not the site inventory.

6.7.13. Condition of the receiving ecosystem

The condition of the wetland matters to this assessment because it determines how much additional pressure the system can absorb. CERMES Technical Report No 110 reports that the benthic community of the Sanctuary comprises seventeen taxa at densities between 304 and 10,609 individuals per square meter. For comparison, a healthy red mangrove community in Florida supported approximately three hundred taxa at densities between 22,591 and 52,914 per square meter. On that evidence the report characterizes the Graeme Hall mangrove system as a critically endangered mangrove ecosystem.

Three findings in the same report identify the mechanisms. Benthic biodiversity is lowest at the sites closest to stormwater runoff inputs and highest at those farthest from them. The lack of a drainage outlet and of tidal exchange favors freshwater competitors over the estuarine community the system should support, and biodiversity would be expected to recover if connectivity to the sea were re-established. And the existence of a high-volume emergency discharge of raw sewage into the Ramsar wetland presents a continuing threat to water quality, to the ecosystem and to human health. Water quality sampled in the Sanctuary and its surroundings has on numerous occasions violated proposed Barbadian standards for the protection of the environment and public health.

6.8. Social Baseline

The Social baseline is a carefully selected set of social indicators (social variables) with accompanying qualitative data pertinent to the project's area of influence. The baseline refers to a point of comparison – in other words, to the data (social indicators) about the affected communities that will be used as the reference data against which to measure the impacts of the project on communities affected by the project. This section also includes elements that touch on socio-economical and socio-environmental aspects.

In accordance with local and international legislation, policy and good practice, the social baseline examines the existing social, economic, and physical environment to understand the existing situation within the project's area of influence prior to the commencement of the project. The baseline provides the parameters for analyzing how potential anthropogenic inducements could affect the social, health, gender, and economic conditions within the project's area of influence.

The social baseline was compiled using secondary and primary data. Secondary data was derived from preexisting sources for example national legislative regime, census data, and economic data, while

primary data was compiled through a field visit and engagements with key project stakeholders and project affected persons (PAPs) within the Program's direct area of influence. The baseline conditions for the project are stated in this chapter.

6.8.1. Project area

The parish of Christ Church is one of the original six parishes of the eleven parishes of Barbados. It has a land area of 57 km2 (22 sq miles) and is found at the southern end of the island. Oistins is the main town and former capital of the parish. The Parish was founded in 1629 by Governor Sir William Tufton (1589–1650), the 5th Governor of Barbados. The community of Graeme Hall is nested within the Christ Church Parish. The neighborhood can be described as high society, meaning that many affluent persons reside in the community of Graeme Hall[41].

One of the notable landmarks of the Graeme Hall Community is the last remaining mangrove swamp in the country, the Graeme Hall Nature Sanctuary. The wetland complex is a protected area under the Physical Development Plan. It supports bird and other wildlife populations of recognized ecological value and plays a critical role in preserving biodiversity on the island. The Graeme Hall Nature Sanctuary is a privately owned facility within the complex; it has been closed to the public since late 2008 or 2009 following environmental and regulatory disputes, so the Ramsar designation and the Sanctuary should not be treated as the same. (Graeme Hall Nature Sanctuary: About Us, History & Mission)

The sanctuary reopened in May 2025, having been closed for sixteen years, and was restored and is now managed by the Barbados Wetland Trust. It covers roughly thirty-eight percent of the area designated under the Ramsar Convention, and the balance remains in government ownership without an active management regime. The two parts are hydrologically and ecologically continuous, so an effect arising in one is not contained within that delimitation.

Also, proximate to Graeme Hall is the Harmony Hall community, which is adjacent to the existing South Coast Sewerage Treatment Plant. Other notable area to be found in Christ Church Parish is the taverns, clubs, and hotels of St Lawrence Gap, which are very active with tourists and locals.

Project-specific risk profile. The project area matters socially because of what the Project brings into it. The Workers' Camp will house 120 non-local, almost entirely male personnel for the three-year construction period, about 250 m from the nearest homes in Harmony Hall, and up to 203 people will be on the sites on a working day, all using a single access road that also serves the community and two schools. The points at which workers and residents meet are predictable: the community road and the camp gate, the bus stops on the road and the ABC Highway corridor, the shops and rum shops of Harmony Hall and Worthing, the beaches of the south coast, and St. Lawrence Gap, the island's main nightlife district, roughly 0.6 to 1 km from the site. The receiving community is older and more female than the national average: half of households are headed by women, a quarter of residents are aged 65 or over, and the daytime population is predominantly older women (Section 6.8.2). The residents most sensitive to the construction works, the camp and labor influx are older women and female-headed households, working-age women renting privately, women and girls in informal work in the Gap and along the community road, adolescent girls on the school route, women with disabilities and migrant women; why each is affected and the local evidence for each are set out in Sections 6.8.10 and 6.8.14 and in the

[41] The observation was made by the researcher during the field scoping activities. Affluence is determined by the quality of houses and personalities that reside in the area.

Gender and Social Assessment (Section 7.6.4). Each is reached through targeted engagement, separate meetings and tailored communication (Section 7.6.9 and the Stakeholder Engagement Plan) and protected through safe routes and traffic windows, camp rules on worker movement and conduct, and confidential access to the GRM (Traffic and Pedestrian Management Plan, Code of Conduct and Grievance Redress Mechanism, Sections 8.4.6, 8.4.8 and 8.4.12).

6.8.2. Population demographics

The population of Barbados is predominantly black (92.4%) or mixed (3.1%). 2.7% of the population is white and 1.3% South Asian[42]. The remaining 0.4% of the population includes East Asians (0.1%) and Middle Easterners (0.1%). The population is a youthful population with 24.69% averaging 25-54 years of age. With a larger percentage of females[43].

- 0-14 years: 17.49% (male 25,762/female 25,764)
- 15-24 years: 12.34% (male 18,024/female 18,330)
- 25-54 years: 42.69% (male 62,655/female 63,093)
- 55-64 years: 13.91% (male 19,533/female 21,430)
- 65 years and over: 13.57% (male 16,398/female 23,571) (2020 est.)

6.8.2.1. Demographic and Household Profile

Enumeration area data from the 2021 Population and Housing Census for Graeme Hall, St. Lawrence, Worthing and Rendezvous record a resident population of 1,680, comprising 786 male and 894 female residents (Statistics Barbados, 2024)[44]. Women constitute 53.2 percent of residents, and the imbalance widens with age, reaching 57.6 percent among persons aged 55 to 64 and 59.4 percent among persons aged 65 and over.

Table 39 presents the population by age band and sex.

Table** 39**: Population by age band and sex

Age band	Total	Male	Female	Share
0 to 14 years	217	112	105	12.9%
15 to 24 years	169	93	76	10.1%
25 to 54 years	514	243	271	30.6%
55 to 64 years	257	109	148	15.3%
65 years and over	433	176	257	25.8%
Total	1,680	786	894	100%

[42] Central Intelligence Agency. (2024). The World Factbook: Barbados – People and society. CIA. https://www.cia.gov/the-world-factbook/countries/barbados/#people-and-society

[43] United Nations, Department of Economic and Social Affairs, Population Division. (2024). World Population Prospects 2024: Barbados. UN. https://population.un.org/wpp

[44] Statistics Barbados. (2024). 2021 Population and Housing Census. Bridgetown: Barbados Statistical Service. https://stats.gov.bb/wp-content/uploads/2024/02/2021-Population-and-Housing-Census.pdf

Age band	Total	Male	Female	Share

The age and sex of the people living around the site. The figure to take from it is that 25.8 percent of residents are 65 or over, against 13.57 percent for Barbados as a whole (Statistics Barbados, 2024)[45]. That matters because odor, dust and noise affect older people more, and because respiratory and heart conditions are more common in that age group. Persons aged 65 and over constitute 25.8 percent and persons aged 55 and over, 41.1 percent. A significantly older demographic raises sensitivity to the odor, particulate and noise pathways.

Table 40 presents the households and headship.

Table** 40**: Households and headship

Measure	Figure
Total household heads	667
Male household heads	320
Female household heads	347
Household heads aged 65 and over	292
Owner occupation	60.3%
Private rental	26.9%

While household composition and headship patterns provide important context for understanding the demographic structure of the area, it is equally critical to examine the economic activity of residents aged 15 years and over. This perspective highlights the balance between active labor force participation and those outside of the workforce, including retirees, homemakers, and persons incapacitated, who remain present in the community during the working day. Table 41 therefore complements the household data by illustrating the economic roles and daily presence of the population most exposed to construction activity, odor events, and daytime bypass impacts.

Table** 41**: Economic activity, persons aged 15 and over

Activity	Number
Worked in the reference period	674
Retired	373
Looked for work	101

[45] Ibid

Activity	Number
Student	83
Home duties	68
Recorded as incapacitated	32
Total aged 15 and over	1,463

Table 41 presents the economic activity of persons aged 15 years and over, highlighting the distribution between those engaged in employment and those outside of the labor force. Notably, the retired, individuals performing home duties, and those recorded as incapacitated together total 473 persons. This segment of the population remains present in the area throughout the working day and is therefore particularly exposed to construction activity, odor events, and any daytime bypass. The table thus provides critical context for understanding both the active workforce and the daytime resident population whose vulnerability to environmental pathways is heightened by their continuous presence.

The census tabulation of economic activity (Table 41) is not disaggregated by sex, and a sex breakdown of the 101 residents who looked for work, the 68 on home duties and the 32 recorded as incapacitated has been requested from Statistics Barbados. The sex-disaggregated tabulations that are available for the same enumeration areas, by occupation (Table 44), relationship to head of household (Table 45) and house tenure (Table 46), are analyzed in Sections 6.8.8, 6.8.9 and 6.8.14. On the activity data alone, the unemployment rate among residents aged 15 and over who were economically active is 13.0 percent (101 of 775), well above the national rate of 4.9 percent reported in Section 6.8.10, and the 473 residents outside the labor force who are present during the working day are predominantly women, since women are 59.4 percent of residents aged 65 and over and home duties remain overwhelmingly a female activity nationally.

Parish-level data confirm the direction. The 2021 Census records for Christ Church 6,010 men and 5,880 women who worked in the reference period and 801 men and 900 women who looked for work (Barbados Statistical Service, 2023, Table 8.07), a parish unemployment rate of 12.5 percent among the economically active in which women are 53 percent of the unemployed while under half of the employed. The enumeration areas around the site sit within that pattern.

6.8.3. Education

Barbados' education philosophy ensures that every child has access to opportunities that maximize their abilities and contribute to national development. The system spans four tiers: **pre-primary** (ages 3 –5), **primary** (ages 5–12+), **secondary** (ages 10+–16+), and **tertiary** (post-secondary academic, technical, vocational, and university education). Alongside public institutions, Barbados has **private schools**, mostly secular, with some denominational ones open to all faiths. *(Ministry of Education, 2000)*. It is estimated that private schools account for about 9% of the primary and secondary school population *(Rudder, 2014, as cited in Brissett, 2021)* *(Brissett, 2021)*. Additionally, assisted **private secondary schools** receive government support through grants, bursaries, and subventions, ensuring broad access to quality education across the country *(Ministry of Education, 2000)*.

To address the changing needs of education in Barbados the Government has embarked on a number of transformational initiatives. One key initiative is the strengthening of foundational learning skills in pre-primary and primary education, improving access to a climate-resilient and inclusive learning environment. *(World Bank, 2026)*

According to Griffith (2002), the World Bank and the AACRAO Electronic Database for Global Education, Barbados has one of the highest literacy rates in the world.[46.47] This feat has been achieved as a result of substantial public subsidization of education.

There are two educational institutions located within Graeme Hall and surrounding communities. These include St. Luke's Academy, a private Montessori-inspired school, focused on environmental education and, St Lawrence Primary School, a publicly managed school, located nearby to the site, situated on the outskirts of Harmony Hall. The second of these institutions has been known as St Lawrence Primary School since 2000; the former name St Lawrence Composite is no longer in use.

The population of Barbados is assessed as very literate; Barbados boasts one of the most robust and highly developed education systems in the Caribbean, featuring a near-universal literacy rate of over (99%). The government demonstrates a strong commitment to the sector, dedicating approximately (4.9%) of its GDP and over (12%) of total public expenditures to education. Women in Barbados experience exceptionally high levels of educational attainment, frequently outperforming men across multiple academic metrics. Female literacy stands at (99.6%), and girls boast a lower secondary school completion rate of (101.9%). Furthermore, women represent a significant majority in tertiary-level enrollments and degree completions across the country[48]. Educational attendance in Christ Church, by sex, is given in Table 42.

[46] World Bank. (2026). Literacy rate, adult total (% of people ages 15 and above) – Barbados. Accessed at https://data.worldbank.org/indicator/SE.ADT.LITR.ZS?locations=BB (World Bank, 2026)

[47] AACRAO. (n.d.). Barbados. Accessed at https://www.aacrao.org/edge/country/barbados (AACRAO, n.d.)

[48] World Bank. 2025. Barbados Gender Scorecard. Accessed at https://documents1.worldbank.org/curated/en/099746402202539962/pdf/IDU19bfe3ce819af314f9c19f5515c59b19a4cb1.pdf (World Bank, 2025)

Table** 42**: Educational Attendance Level Population of Christ Church

Parish | Sex	**Educational attendance level**								
	Total	**Preprimary (Nursery to Reception)**	**Primary (Infants A to Class 4)**	**Secondary (1st Form to 5th Form)**	**Post-secondary (includes 6th Form and Associate's degree lev**	**Tertiary**	**Other (Please Specify)**	**Not Stated**	
	Count	Count	Count	Count	Count	Count	Count	Count	
Christ Church	Both Sexes	5054	328	1969	1541	342	786	87	1
	Male	2426	159	988	783	138	320	37	1
	Female	2628	169	981	758	204	466	50	0

Highest educational level attained, by five-year age group and sex, is presented in Table 43.

Table 43*: Highest Educational Level attained by Sex*

5 Year Age Groups | Sex	Highest educational level										
	Total	**Preprimary (Nursery to Reception)**	**Primary (Infants A to Class 4)**	**Secondary (1st Form to 5th Form)**	**Senior\Composite**	**Post-secondary (includes 6th Form and Associate's degree lev**	**Tertiary**	**Other (Please Specify)**	**None**	**Not Stated**	
	Count	Count	Count	Count	Count	Count	Count	Count	Count	Count	
Total	Both Sexes	98443	72	7918	53471	3580	11960	19645	1078	567	152
	Male	46359	32	3454	26907	1592	5631	7897	508	249	89
	Female	52084	40	4464	26564	1988	6329	11748	570	318	63
15 - 19	Both Sexes	3040	1	7	2452	16	379	150	24	9	2
	Male	1703	0	6	1431	6	170	61	20	7	2
	Female	1337	1	1	1021	10	209	89	4	2	0
20 - 24	Both Sexes	6227	1	15	3779	45	1112	1200	55	15	5
	Male	3283	1	5	2143	26	583	483	28	10	4

5 Year Age Groups | Sex	Highest educational level										
	Total	**Preprimary (Nursery to Reception)**	**Primary (Infants A to Class 4)**	**Secondary (1st Form to 5th Form)**	**Senior\Composite**	**Post-secondary (includes 6th Form and Associate's degree lev**	**Tertiary**	**Other (Please Specify)**	**None**	**Not Stated**	
	Count	Count	Count	Count	Count	Count	Count	Count	Count	Count	
	Female	2944	0	10	1636	19	529	717	27	5	1
25 - 29	Both Sexes	6991	4	16	3714	42	1213	1917	58	20	7
	Male	3493	3	11	2032	25	597	773	35	13	4
	Female	3498	1	5	1682	17	616	1144	23	7	3
30 and over	Both Sexes	82185	66	7880	43526	3477	9256	16378	941	523	138
	Male	37880	28	3432	21301	1535	4281	6580	425	219	79
	Female	44305	38	4448	22225	1942	4975	9798	516	304	59
Source: Barbados Statistical Service, Population and Housing Census 2021											

What the education data mean for the Project is a question of fit between local attainment and the jobs the works create. Women in Christ Church outnumber men at post-secondary (204 against 138) and tertiary (466 against 320) attendance (Table 42), and nationally 22.6 percent of women aged 15 and over hold a tertiary qualification against 17.0 percent of men (Table 43). The occupational profile of the enumeration areas confirms the pattern: women hold two thirds of professional posts and most clerical and service jobs, while men hold 84 of the 90 craft and related trades posts (Table 44). The construction phase creates demand for exactly the trades in which local women are absent, and the national segregation in TVET enrolment means the pool of locally qualified women for skilled construction roles will be small. Local hiring provisions aimed at women therefore need to be paired with entry-level training, apprenticeships and outreach through the Samuel Jackman Prescod Institute of Technology and the Barbados Vocational Training Board, as provided in the Labor Management Plan (Section 8.4.7.4), and the operations phase, which calls for laboratory, administrative and technical staff, is where women's qualifications match the roles on offer.

6.8.4. Religion

According to the 2010 census, 75.6% of the population of Barbados is considered Christian, 2.6% have a non-Christian religion and 20.6% have no religion[49].

Anglicanism constitutes the largest religious group, with 23.9% of the population. It is represented by the Church in the Province of the West Indies, within which the island belongs to the Diocese of Barbados. Pentecostals are the second largest group (19.5%).The next largest group are Seventh-day Adventists, 5.9% of the population, followed by Methodists (4.2%). 3.8% of the population are Roman Catholics. Other Christian denomination include Wesleyans (3.4%), Nazarenes (3.2%), Church of God (2.4%), Jehovah's Witnesses (2.0%), Baptists (1.8), Moravians (1.2%), Brethren (0.5%), the Salvationists (0.4%) and Latter-day Saints (0.1%)[50].

The number of non-Christians is small. 0.7% of the population are Muslims, most of whom are immigrants or descendants of Indian immigrants from the Indian state of Gujarat. There are three mosques and an Islamic Centre. Other religious groups include the Rastafarians (1.0% of the population), which was introduced to Barbados in 1975, Hindus (0.5%), Jews (0.05%), the Baha is (0.04%) and Buddhists.

6.8.5. Languages

English is the official language of Barbados and is used for communications, administration, and public services all over the island. In its capacity as the official language of the country, the standard of English

[49] United States Department of State. (2018). International Religious Freedom Report: Barbados. Office of International Religious Freedom. https://www.state.gov/international-religious-freedom-reports/

[50] United States Department of State. (2018). International Religious Freedom Report: Barbados. Office of International Religious Freedom. https://www.state.gov/international-religious-freedom-reports/

tends to conform to the vocabulary, pronunciations, spellings, and conventions akin to, but not exactly the same as, those of British English.

A regional variant of English referred to locally as Bajan is spoken by most Barbadians in everyday life, especially in informal settings. In its full-fledged form, Bajan sounds markedly different from the Standard English heard on the island. The degree of intelligibility between Bajan and general English depends on the level of creolized vocabulary and idioms. A Bajan speaker may be completely unintelligible to an English speaker from another country. Moreover, Bajan is influenced by other Caribbean English dialects.

6.8.6. Health

Barbados has a system of universal health coverage. However, there is a mix of private institutions that also serve the health sector in Barbados. Primary offerings encompass routine wellness exams, prenatal and postnatal care, cancer screenings (such as Pap smears and breast exams), and specialized menopause or fertility support.

The Ministry of Health and Wellness reported an infant mortality rate of 7.6 deaths per 1,000 live births for 2023[51]. The Pan American Health Organization interagency series records 18.1 deaths per 1,000 live births for 2022 against 13.4 in 2000, while describing that movement as a decrease of 35.1 percent, a statement that is internally inconsistent in the source. The two series are not reconciled here, and the national vital statistics should be used as the authoritative statement. The percentage of low-weight births below 2,500 g remained at 11 percent between 2003 and 2022, and exclusive breastfeeding to six months of age was 19.7 percent, unchanged from 2012 (Pan American Health Organization, 2025)[52].

The maternal mortality ratio is the number of women who die from pregnancy-related causes while pregnant or within 42 days of the termination of pregnancy, per 100,000 live births. PAHO estimates the ratio at 39.1 deaths per 100,000 live births in 2020, a reduction of 19.3 percent on the estimate for 2000. The World Bank Gender Data Portal reports a different series, improving from 55 in 2000 to 35 in 2023; the two are drawn from different estimation methods and should not be read as a single trend. Total fertility was estimated at 1.7 children per woman in 2024. Adolescent fertility fell 25.8 percent, from 60.6 live births per 1,000 women aged 15 to 19 in 2000 to 45.0 in 2024. In 2022, 98.2 percent of births were attended by skilled personnel, and between 2011 and 2020 antenatal care coverage rose from 89 to 90 percent (Pan American Health Organization, 2025; World Bank, 2023).

In 2021, there were 0 new cases of tuberculosis per 100,000 population in Barbados. In 2019, the overall tuberculosis mortality rate (age-adjusted and per 100, 000 population) was 0.3 (0.2 in women and 0.3 in men)[53].

[51] Barbados Today. (2025). Minister Ishmael: Maternal & Infant Mortality Rates Low. https://health.gov.bb/News/Press-Releases/Minister-Ishmael-Maternal-Infant-M

[52] World Bank. (2023). 35 women die per 100,000 live births due to pregnancy-related causes in Barbados. Accessed at https://genderdata.worldbank.org/en/economies/barbados (World Bank, 2023)

[53] PAHO. (2024). Barbados – Country Profile. https://hia.paho.org/en/country-profiles/barbados

In 2022, the estimated human immunodeficiency virus (HIV) infection incidence rate (new diagnoses) was 33.6 per 100 000 population. The age-adjusted mortality rate for HIV was 8.4 per 100 000 population in 2019. It should be noted that during the 2000-2019 period, this indicator decreased by 85.4%[54].

In Barbados in 2023, the prevalence of tobacco use among people aged 15 and older was 6.9% (PAHO, 2024)[55]. In the same age group, the prevalence of overweight and obesity was 67.2% in 2022 (PAHO, 2024)[56]. Also in 2016, 42.9% of the population reported insufficient physical activity.

In 2015, the reported prevalence of arterial hypertension (high blood pressure) among people aged 18 years or older was 24.4%, a decrease of 1.7 percentage points compared to 2000 (26.1%). The prevalence of diabetes mellitus, which stood at 9.1% in 2000, increased to 12.2% in 2014.[57]

In 2019, the adjusted rate of potentially avoidable premature mortality in Barbados was 198.5 deaths per 100 000 population, a decrease of 29.5% from a rate of 281.5 in 2000. This meant that, in 2019, the rate in the country was 12.4% lower than the average rate reported for the Region of the Americas as a whole. Among potentially avoidable premature mortality, the rate for preventable causes was 88.6 per 100 000 population in 2019, which is 35.4% lower than the regional average rate; and the rate for treatable causes was 109.8 per 100 000 population, above the regional average of 89.6[58].

The overall age-adjusted mortality rate was 6 per 1 000 population in 2019, a decrease of 8.4% compared to 2000 (6.5 deaths per 1000 population)[59].

When deaths are categorized into three main groups, it is observed that, in 2019, the age-adjusted mortality rate from communicable diseases was 82.7 per 100 000 population (93.3 per 100 000 in men and 73.0 per 100 000 in women), while the age-adjusted mortality rate from noncommunicable diseases was 477 per 100 000 population (533.4 per 100 000 in men and 430.9 per 100 000 in women). The rate of age-adjusted mortality from external causes was 36.9 per 100 000 population (52.4 per 100 000 in men and 22.1 per 100 000 in women), including road traffic accidents (8 per 100 000 population), homicides (10.2 per 100 000 population), and suicides (0.3 per 100 000 population). In 2000, the percentage distribution of causes was 80.6% for noncommunicable diseases, 15.9% for communicable diseases, and 3.4% for external causes; in 2019, the percentages were 82.8%, 12.9%, and 4.3%, respectively (*PAHO 2024*)[60]. The leading causes of death in Barbados are shown at Figure 54.

[54] Ibid
[55] Ibid
[56] Ibid
[57] Ibid
[58] Ibid
[59] Ibid
[60] Ibid

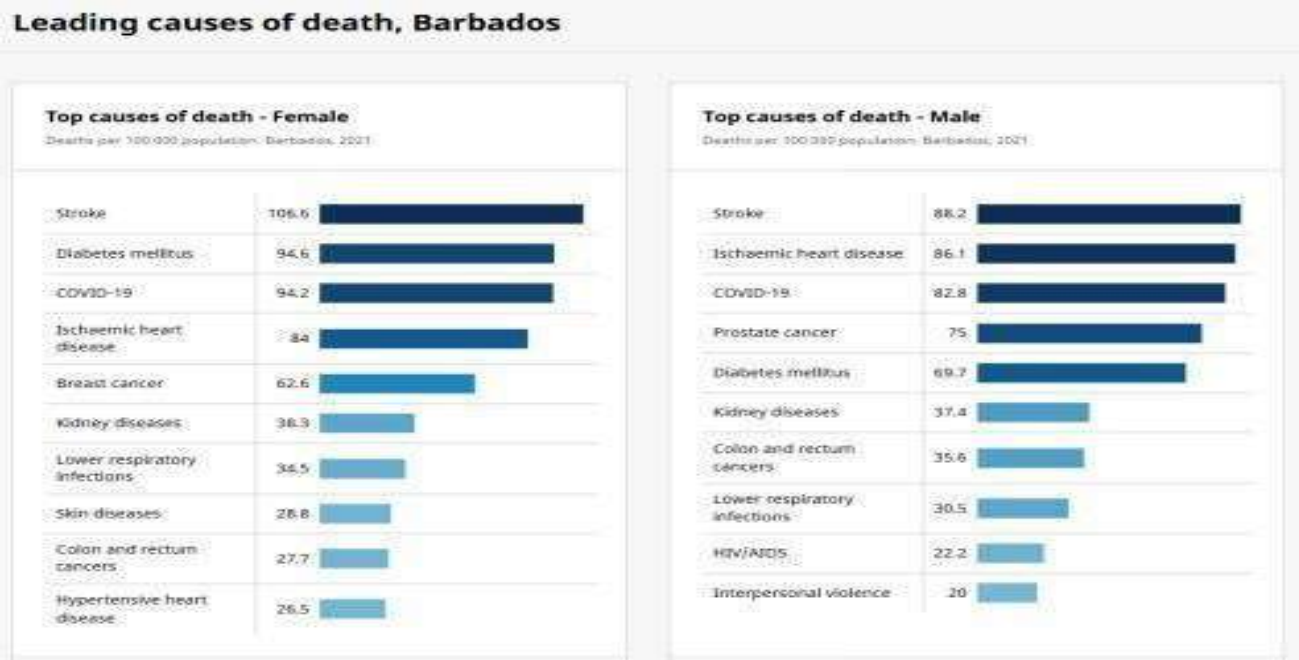


Figure 54**: Leading Cause of Death in Barbados**

The national indicators above bear on the Direct Area of Influence through its age and sex structure. One resident in four (433 of 1,680) is aged 65 or over and 59.4 percent of that group are women (Table 39), so the population most sensitive to the respiratory and cardiovascular effects of dust, odor and hydrogen sulfide, and to heat, is predominantly older women, many of them heading their own households (161 female heads aged 65 and over, Table 45). Prevalence of chronic respiratory and cardiovascular disease is not tabulated below parish level; the leading causes of death nationally (Figure 53) are the proxy, and the Community Health Plan (Section 8.4.10) treats older residents of Harmony Hall as the high-sensitivity receptor for the nuisance and health pathways. Access to care compounds the exposure. The two clinics within the area are private, fee-paying, operate general outpatient hours only and offer no emergency or after-hours service, and the Queen Elizabeth Hospital is about 7 km away. For an older woman without a car, an evening medical need means a trip to Bridgetown by bus or taxi; the Emergency Response Plan and on-site first aid arrangements (Section 8.4.3) are therefore designed on the assumption that the Project, not the local health system, provides the first response to any community health incident it causes.

6.8.7. Economy

Barbados, one of the wealthiest and most developed nations in the Eastern Caribbean, boasts a dynamic, internationally competitive economy led by private sector innovation *(Worrell, 2017)*. With a 2024 GDP estimated at USD 7.09 billion, its economy is one of the most diversified in the sub-region of the Eastern Caribbean, supported by tourism, offshore finance, and information services, alongside a highly educated workforce. While historically reliant on sugarcane, diversification into light industry and services has strengthened resilience, though challenges remain with supply chain delays and volatile food and fuel prices. Inflation is recorded at 0.8% in 2025. The IMF projects 2.7% GDP growth for 2025[61]. Strategic transformation policies prioritize **tourism** as the top driver, focusing on aviation, regulation,

[61] Central Bank. (2025). Outlook for Barbados' Economy in 2025 (Updated April 2025). https://www.centralbank.org.bb/news/general-press-release/updated-outlook-for-barbados-economy-in-2025

and digital management systems; the energy transition targeting net-zero emissions by 2035 with USD 9.5 billion in clean technology investments; agriculture through climate-smart practices, digital frameworks, and disaster management for food security; and the blue economy via marine asset valuation, coastal upgrades, and digital shipping systems. Together, these initiatives align with Barbados' sustainable development strategy, balancing growth, resilience, and environmental stewardship. *(OECD, 2025)*

The local economy in the project DAI mirrors the broader national environment, with tourism and its related services serving as the primary drivers of growth. In communities directly impacted by the project, **tourism**, **agriculture**, and **services** form the core economic engines. Homeowners generate income by renting properties to visitors, farmers work diligently to sustain local food production, and small bars provide entrepreneurial opportunities, strengthening livelihoods and fostering community resilience.

6.8.8. Labor and migrant workers

The Barbados Labor force landscape is complex, impacted by migration trends, and social and legislative provisions for vulnerable groups (women, youth, persons with disabilities, and migrant workers).

In terms of migration, Barbados is undergoing significant demographic and migration transitions that directly affect its labor market and broader development goals. With an aging and declining population replacement reflected in a fertility rate of 1.8 and a rising age-related dependency ratio - the country faces labor shortages and economic sustainability challenges (ILO, 2025)[62]. The latest estimates indicate a population of approximately 282,336, with about 30 percent under the age of 25 and an even split between women and men[63]. The working-age population (16-64 years) represents 66 percent of the total, while 16 percent are 65 years or older. This results in an age-related dependency ratio exceeding 50 percent, which is projected to increase (ILO, 2025)[64].

Migration significantly affects population trends, with over 25 percent of Barbadian nationals residing abroad, while the country also attracts a significant share of migrant workers, especially from other CARICOM countries (ILO, 2025)[65]. While managed immigration will play an important role in addressing labor market challenges arising from an aging population – including increased demand for care services, the continued loss of skilled emigrants highlights the economy's limited capacity to generate attractive employment opportunities for many Barbadians.

As a result, Barbados has experienced a decline in both the total labor force and labor force participation rates over the past two decades, and some challenges persist in relation to job creation and unemployment. The labor force has declined from 146,300 in 2004 to 134,300 in 2023, while the participation rate has fallen from 69.5 percent to 62.3 percent over the same period. More than 81,000 adults were economically inactive in 2023, up from 64,000 in 2004, primarily due to an increasing number

[62] International Labour Organization. (2025). Barbados Decent Work Country Programme (DWCP) 2025–2030.
[63] United Nations, Department of Economic and Social Affairs, Population Division. (2024). World Population Prospects 2024: Barbados. https://population.un.org/wpp
[64] International Labour Organization. (2025). Barbados Decent Work Country Programme (DWCP) 2025–2030. https://www.ilo.org/sites/default/files/2025-10/DWCP%20Barbados%202025-2030.pdf
[65] Ibid

of retired persons. Total unemployment rates have steadily declined since 2004, although the 2024 rate of 7.7 percent still exceeds the Caribbean average (6.8 percent)[66].

Additionally, many workers are engaged in forms of work that often lead to decent work deficits. This includes an increasing number of workers in non-standard forms of employment (NSFE), such as temporary service contracts and remote work for foreign employers, while as much as half of total employment may be informal. Youth and workers with lower levels of educational attainment are more likely to engage in NSFE and informal work. Inward migration, both intra-regional and international, is increasingly critical for filling workforce gaps.

Women's position in the labor market, including their lower participation rate, concentration in low-paid sectors and share of unpaid care work, is described in the gender baseline (Section 6.8.14).

There are additional challenges facing youth, people with disabilities, and migrant workers. Youth unemployment is a particular concern, with unemployment rates consistently above the rate for other working-age adults (estimates vary between 11 and 35%)[67]. There are no recent data on broader measures of youth economic activity, but data from 2016 estimated that 23% of young people were not in education, employment, or training (NEET) and thus at risk of long-term social and economic exclusion, with higher rates among men (26%) than women (20%)[68].

There is no data on labor force participation of people with disabilities, but stakeholders report multiple barriers in access to decent employment, including discrimination, limited accessibility to training and workplaces, and inflexibility in social assistance schemes that may disincentivize transitions into employment.

Migrant workers play a key role in Barbados' labor market, but they are disproportionately exposed to Decent Work deficits due to concentration in low-paid and insecure forms of work (informal economy, construction, domestic work), lack of awareness of rights, and vulnerable legal and/or economic circumstances. Migrants accounted for around 12% of the population in 2019, with the majority of working age and employed in lower-skill occupations and sectors such as services, agriculture, and construction[69].

Addressing Barbados' complex labor market challenges requires integrated policy measures and stronger institutional capacities. Information gaps in national statistical data and institutional capacity hinder evidence-based policymaking and planning. A fragmented system, with no overarching framework to coordinate planning and policymaking on employment promotion, skills development, enterprise support, and labor migration, makes it increasingly difficult to address market needs. As a starting point, the Government has recognized the need for a more structured and coherent labor migration policy framework to ensure that immigration responds to evolving labor market needs, while continuing to guarantee adequate protection of rights and Decent Work opportunities for both migrant and Barbadian workers.

[66] Barbados Statistical Service. (2024). Continuous Household Labour Force Survey, Q1 2024. https://stats.gov.bb/wp-content/uploads/2024/07/LFS_1Q2024.pdf
[67] Ibid
[68] Central Intelligence Agency. (2024). The World Factbook: Barbados – Youth unemployment. CIA. https://www.cia.gov/the-world-factbook/countries/barbados/#people-and-society
[69] Government of Barbados & International Labour Organization. (2024). Barbados Decent Work Country Programme 2025–2030. International Labour Organization. https://www.ilo.org/sites/default/files/2025-10/DWCP%20Barbados%202025-2030.pdf

The Government has recognized policy gaps, and the Ministry of Labour, Social Security and Third Sector (MLST) is currently leading the development of a new People Development Policy to provide strategic coherence to workforce development and employment promotion efforts, while the Government also plans to develop a labor migration policy as part of wider efforts to strengthen migration governance (ILO, 2025)[70].

A new TVET Policy is also under development, alongside measures to enhance support for enterprise development and entrepreneurship *(e.g., through the new Small and Medium Enterprise (SME) Policy)*. Beyond the policy level, limited institutional capacity remains a challenge in delivering effective labor market policies and programs (ILO, 2025)[71].

Uneven availability of timely labor market data, for example, a lack of data on key labor market trends, including prevalence and characteristics of informality and NSFE, NEET youth, disability inclusion, and characteristics of labor migration. Limited demand, side labor, market data vacancies, skills needed, and lack of a systematic approach to skills forecasting remain an overarching challenge for evidence-based workforce planning and employment policymaking. Strengthening the national statistical system, including the establishment of a fully operational Labour Market Information System (LMIS), is critical to address Decent Work challenges and ensure the effective implementation of Barbados's Decent Work Country Program. The abbreviations used in this passage are set out in full at first use and in the Acronyms and Abbreviations list at the front of this document: NSFE denotes non-standard forms of employment and NEET denotes young people not in employment, education or training.

Enumeration-area data by sex. The 2021 Census records 685 residents of Graeme Hall, St. Lawrence, Worthing and Rendezvous with an occupation, 334 men and 351 women (Table 44). The distribution is strongly segregated. Women hold 91 of the 135 professional posts, 43 of 53 clerical posts and 56 of 85 service and sales posts; men hold 84 of the 90 craft and related trades posts and 6 of 7 plant and machine operator posts. Managerial posts are evenly split (10 women, 8 men). Among residents aged 25 to 54, the group most likely to compete for Project employment, 162 women and 163 men are in work. Sector of employment, formality and own-account status are not tabulated at enumeration-area level; the occupational profile and the national pattern (women concentrated in hospitality, retail, domestic and care work) are the basis for the assessment. The implication is direct: the construction workforce draws on trades in which local women are absent, so without targeted recruitment and training the employment benefit accrues to men, while the women of the area, concentrated in service work serving the south coast tourism economy, bear the disruption to access and footfall during construction.

Migrant and non-national residents. The census tabulation by country of birth for the enumeration areas has not been obtained. Of the 79 households interviewed in April 2026, three (4 percent) were migrant or non-national worker households. Nationally, migrant women from other Caribbean islands and Venezuela are concentrated in domestic work, hospitality and the informal economy, and are the group most exposed to labor and sexual exploitation (Section 6.8.13). The Labor Management Plan (Section 8.4.7) therefore extends its fair recruitment, contract and Code of Conduct protections to subcontracted and migrant workers explicitly, and the GRM accepts complaints without proof of status.

[70] International Labour Organization. (2025). Barbados Decent Work Country Programme (DWCP) 2025–2030.
[71] Ibid

6.8.9. Household types and Poverty Analysis

Barbados exhibits relatively low overall inequality. The Gini coefficient was 34.1 in 2016 –among the lowest in LAC and well below the World Bank's high inequality threshold of 40[72]. Still, disparities persist across population groups: smaller households headed by people who have attained higher levels of education and who are employed are less likely to be poor. Around 10.0 percent of people in households headed by someone who is employed live on less than $8.30 (2021 PPP) per day, compared to 18.5 percent for households headed by someone who is not employed. Notwithstanding this, there are some differences in population groups, with poverty being more prevalent among women and girls, and more so in female-led households[73]. Multidimensional poverty, or poverty that incorporates monetary poverty, education, and basic infrastructure, is also low, recorded as 0.3% of Barbadians were multidimensionally poor in 2016. Yet 4.1 percent of people lacked access to limited standard sanitation, and 3.0% lacked access to electricity (World Bank, 2025). The Gini coefficient of 34.1 for 2016 and the high-inequality threshold of 40 are taken from World Bank country data (World Bank, 2016)[74]. Where an international poverty line is cited in this section it is the upper-middle-income line used for cross-country comparison and not a national poverty line for Barbados; Barbados does not currently publish an official national poverty line, and the figure should therefore be read as a comparative indicator only. Its relevance to the project is that it indicates the margin by which households in the DAI may be exposed to price increases in food, transport and rental accommodation during construction, which is the mechanism assessed under Inflationary Pressure in the Social Impact Assessment Matrix.

Barbados is ranked 36th in economic freedom, putting it within the moderate rating[75]. In its 2026– 27 budget, the government announced a Barbados Republic Child Wealth Fund, under which every child born on or after 30 November 2021 will receive a "birthright investment," held in trust and invested professionally until it can be used for education, housing, or other major life steps. It is universal, statutory once the law is passed, and designed as a permanent feature of the social contract, not a temporary program. The low levels of poverty in the Barbadian society are congruent with Barbados' high per capita income. In fact, Barbados boasts one of the highest per capita incomes in the Caribbean (Jennings).

The country has a relatively well-developed social protection system, which could help sustain incomes if shocks strike. Around 55.3 percent of the population was covered by at least one social protection benefit in 2021. However, the labor market – like the broader economy – depends on tourism, which is highly exposed to climate-related shocks. Wholesale and retail trade, along with accommodation and food services, are the largest employers, engaging 15.4 percent and 12.0 percent of workers respectively in Q3 2024. To address this challenge, the 2022 Barbados Economic Recovery and Transformation (BERT) plan supports diversifying the economy alongside efforts to reduce public debt, enhance competitiveness, invest in education and health, and provide affordable housing (World Bank, 2025) . The labor force and social protection coverage figures in this passage are drawn from the Barbados Statistical Service labor force survey and from the International Labour Organization social protection data for Barbados respectively, for the years stated.

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[72] World Bank. (2016). Gini index – Barbados. World Bank, Poverty and Inequality Platform. https://pip.worldbank.org

[73] World Bank Open Data. (2016). Poverty headcount ratio at $8.30 a day (2021 PPP) – Barbados. https://data.worldbank.org/indicator/SI.POV.UMIC?locations=BB

[74] World Bank. (2016). Gini index - Barbados [Data set]. Poverty and Inequality Platform. https://data.worldbank.org/indicator/SI.POV.GINI?locations=BB

[75] Economic Freedom. (n.d.). Index of Economic Freedom. https://economicfreedom.heritage.org/

Group and multidimensional poverty measures are shown at Figure 55.

Group and Multidimensional Poverty

Poverty by Group	Poverty Rate (%)
Urban population	N/A
Rural population	N/A
Males	14.7
Females	16.8
0 to 14 years old	25.1
15 to 64 years old	14.2
65 and older	8.4
Without education (16+)	14.6
Primary education (16+)	12.1
Secondary education (16+)	15.6
Tertiary/post-secondary education (16+)	6.9

Multidimensional Poverty Components	(% of Pop.)
Daily income less than US$3.00 per person	0.5
At least one school-aged child is not enrolled in school	0.2
No adult has completed primary education	0.4
No access to limited-standard drinking water	0.9
No access to limited-standard sanitation	4.1
No access to electricity	3.0

Note:
N/A denotes a missing/removed value, while N/A* refers to a value which was removed due to having fewer than 30 observations.
The rates in the Poverty by Group table above are shown at the $8.30 upper-middle income line.
Data for the Poverty by Group table is derived from a 2016 survey and data for the Multidimensional Poverty Components table is derived from a 2016 survey.

Figure 55**: Group and Multidimensional Poverty**

Table 44 gives the aggregated population of Graeme Hall, St Lawrence and Worthing by first-level occupation.

Table 44*: Aggregated Population of Graeme Hall, St. Lawrence, Worthing and Rendezvous by 5 year Age Group, Sex and 1st Level Occupation*

	1st Level Occupation													
	Total	**Legislator, Senior Officials and Managers**	**Professionals**	**Technicians and Associate Professionals**	**Clerks**	**Service Workers and Shop and Market Sales Workers**	**Skilled Agricultural and Fishery Workers**	**Craft and Related Workers**	**Plant and Machine Operators and Assemblers**	**Elementary Occupations**	**Not Stated**			
	Count	Count	Count	Count	Count	Count	Count	Count	Count	Count	Count			
Sex of Person	**Total**	**5 Year Age Groups**	Total	685	18	135	80	53	85	0	90	7	8	209
			0 - 4	0	0	0	0	0	0	0	0	0	0	0
			5 - 9	0	0	0	0	0	0	0	0	0	0	0
			10 -14	0	0	0	0	0	0	0	0	0	0	0
			15 -19	10	0	5	0	0	2	0	1	0	0	2
			20 -24	26	0	5	4	1	6	0	6	0	0	4
			25 -29	47	1	15	7	2	5	0	5	1	0	11
			30 -34	66	2	13	11	4	11	0	9	0	0	16
			35 -39	52	0	10	5	3	10	0	7	2	0	15
			40 -44	52	1	10	4	2	2	0	10	1	0	22

	1st Level Occupation												
			45 -49	52	1	6	9	2	6	0	7	0	0	21
			50 -54	56	1	10	2	3	6	0	8	2	2	22
			55 -59	59	3	11	8	7	8	0	8	0	0	14
			60 -64	59	3	14	6	7	5	0	10	0	0	14
			65 & over	206	6	36	24	22	24	0	19	1	6	68
	Male	5 Year Age Groups	Total	334	8	44	51	10	29	0	84	6	5	97
			0 - 4	0	0	0	0	0	0	0	0	0	0	0
			5 - 9	0	0	0	0	0	0	0	0	0	0	0
			10 -14	0	0	0	0	0	0	0	0	0	0	0
			15 -19	5	0	1	0	0	1	0	1	0	0	2
			20 -24	16	0	2	3	0	3	0	6	0	0	2
			25 -29	24	1	3	5	1	2	0	5	1	0	6
			30 -34	26	0	3	7	1	3	0	8	0	0	4
			35 -39	26	0	4	4	0	4	0	7	1	0	6
			40 -44	32	0	6	2	0	0	0	9	1	0	14
			45 -49	27	1	2	6	0	2	0	6	0	0	10

	1st Level Occupation												
			50 -54	28	0	2	1	1	1	0	8	2	2	11
			55 -59	27	2	3	5	1	3	0	8	0	0	5
			60 -64	26	0	4	4	0	1	0	9	0	0	8
			65 & over	97	4	14	14	6	9	0	17	1	3	29
	Female	5 Year Age Groups	Total	351	10	91	29	43	56	0	6	1	3	112
			0 - 4	0	0	0	0	0	0	0	0	0	0	0
			5 - 9	0	0	0	0	0	0	0	0	0	0	0
			10 -14	0	0	0	0	0	0	0	0	0	0	0
			15 -19	5	0	4	0	0	1	0	0	0	0	0
			20 -24	10	0	3	1	1	3	0	0	0	0	2
			25 -29	23	0	12	2	1	3	0	0	0	0	5
			30 -34	40	2	10	4	3	8	0	1	0	0	12
			35 -39	26	0	6	1	3	6	0	0	1	0	9
			40 -44	20	1	4	2	2	2	0	1	0	0	8
			45 -49	25	0	4	3	2	4	0	1	0	0	11
			50 -54	28	1	8	1	2	5	0	0	0	0	11

	1st Level Occupation													
			55 -59	32	1	8	3	6	5	0	0	0	0	9
			60 -64	33	3	10	2	7	4	0	1	0	0	6
			65 & over	109	2	22	10	16	15	0	2	0	3	39
Source: Barbados Statistical Service Population and Housing Census, 2021														

Table 45 gives the same population by relationship to the head of household.

Table** 45**: Aggregated Population of Graeme Hall St. Lawrence, Worthing, and Rendezvous by 5 Year Age Group, Sex, and Relationship to head of Household

	Relationship to Head of Household													
	Total	**Head**	**Spouse/ Partner**	**Child Of Head/ Spouse**	**Son/ Daughter In Law**	**Grandchild**	**Parent/ Parent In Law**	**Other Relative**	**Visitor**	**Other Non-Relative**	**Not Stated**			
	Count	Count	Count	Count	Count	Count	Count	Count	Count	Count	Count			
Sex of Person	**Total**	**5 Year Age Groups**	Total	1680	667	226	437	29	117	25	104	1	40	34
			0 – 4	53	0	0	31	0	14	0	4	0	3	1
			5 – 9	96	0	0	58	0	28	0	4	0	6	0
			10 - 14	68	0	0	34	2	23	0	6	0	3	0
			15 - 19	104	4	0	60	3	25	0	8	0	3	1

	Relationship to Head of Household													
	Total	**Head**	**Spouse/ Partner**	**Child Of Head/ Spouse**	**Son/ Daughter In Law**	**Grandchild**	**Parent/ Parent In Law**	**Other Relative**	**Visitor**	**Other Non-Relative**	**Not Stated**			
	Count	Count	Count	Count	Count	Count	Count	Count	Count	Count	Count			
			20 - 24	65	2	1	41	3	9	0	2	0	5	2
			25 - 29	90	13	10	41	5	9	0	9	0	3	0
			30 - 34	108	28	16	44	5	6	0	5	0	3	1
			35 - 39	108	34	18	37	5	1	0	7	0	2	4
			40 - 44	96	50	16	19	2	0	0	5	1	3	0
			45 - 49	108	47	19	27	2	1	0	4	0	4	4
			50 - 54	94	47	20	15	0	0	0	10	0	1	1
			55 - 59	133	77	25	16	2	0	4	6	0	0	3
			60 - 64	124	73	25	8	0	1	2	11	0	1	3
			65 and over	433	292	76	6	0	0	19	23	0	3	14
	Male	5 Year Age Groups	Total	786	320	58	233	17	62	6	55	1	24	10
			0 – 4	31	0	0	16	0	10	0	3	0	2	0
			5 – 9	50	0	0	32	0	13	0	1	0	4	0
			10 - 14	31	0	0	17	1	8	0	2	0	3	0

	Relationship to Head of Household													
	Total	**Head**	**Spouse/ Partner**	**Child Of Head/ Spouse**	**Son/ Daughter In Law**	**Grandchild**	**Parent/ Parent In Law**	**Other Relative**	**Visitor**	**Other Non-Relative**	**Not Stated**			
	Count	Count	Count	Count	Count	Count	Count	Count	Count	Count	Count			
			15 - 19	55	2	0	33	2	13	0	4	0	1	0
			20 - 24	38	1	0	23	1	5	0	2	0	4	2
			25 - 29	48	7	2	21	2	8	0	7	0	1	0
			30 - 34	46	11	4	23	3	3	0	1	0	0	1
			35 - 39	49	16	7	18	4	1	0	2	0	1	0
			40 - 44	55	34	4	10	1	0	0	3	1	2	0
			45 - 49	51	23	3	15	1	1	0	3	0	4	1
			50 - 54	47	22	8	11	0	0	0	5	0	0	1
			55 - 59	57	39	6	5	2	0	1	4	0	0	0
			60 - 64	52	34	1	6	0	0	2	8	0	0	1
			65 and over	176	131	23	3	0	0	3	10	0	2	4
	Female	5 Year Age Groups	Total	894	347	168	204	12	55	19	49	0	16	24
			0 – 4	22	0	0	15	0	4	0	1	0	1	1
			5 – 9	46	0	0	26	0	15	0	3	0	2	0

	Relationship to Head of Household													
	Total	**Head**	**Spouse/ Partner**	**Child Of Head/ Spouse**	**Son/ Daughter In Law**	**Grandchild**	**Parent/ Parent In Law**	**Other Relative**	**Visitor**	**Other Non-Relative**	**Not Stated**			
	Count	Count	Count	Count	Count	Count	Count	Count	Count	Count	Count			
			10 - 14	37	0	0	17	1	15	0	4	0	0	0
			15 - 19	49	2	0	27	1	12	0	4	0	2	1
			20 - 24	27	1	1	18	2	4	0	0	0	1	0
			25 - 29	42	6	8	20	3	1	0	2	0	2	0
			30 - 34	62	17	12	21	2	3	0	4	0	3	0
			35 - 39	59	18	11	19	1	0	0	5	0	1	4
			40 - 44	41	16	12	9	1	0	0	2	0	1	0
			45 - 49	57	24	16	12	1	0	0	1	0	0	3
			50 - 54	47	25	12	4	0	0	0	5	0	1	0
			55 - 59	76	38	19	11	0	0	3	2	0	0	3
			60 - 64	72	39	24	2	0	1	0	3	0	1	2
			65 and over	257	161	53	3	0	0	16	13	0	1	10

Source: Barbados Statistical Service Population and Housing Census, 2021

Table 46 presents the housing tenure patterns in the DAI and surrounding area.

Table** 46**: Aggregated Population of Graeme Hall, St. Lawrence, Worthing, and Rendezvous by 5 Year Age Group, Sex and House Tenure

	House tenure										
	Total	**Owned**	**Private Rented\Leased**	**Government Rented\Leased**	**Rent free**	**Squatted**	**Other (Please Specify)**	**Not Stated**			
	Count	Count	Count	Count	Count	Count	Count	Count			
Sex of Person	**Total**	**5 Year Age Groups**	Total	677	408	182	5	46	0	5	31
			0 - 4	2	1	0	0	0	0	0	1
			5 - 9	3	0	0	0	3	0	0	0
			10 - 14	0	0	0	0	0	0	0	0
			15 - 19	5	2	2	0	0	0	0	1
			20 - 24	5	0	2	0	1	0	0	2
			25 - 29	15	4	7	0	3	0	0	1
			30 - 34	27	8	13	0	4	0	0	2
			35 - 39	35	12	17	0	1	0	1	4
			40 - 44	51	17	30	0	2	0	0	2
			45 - 49	48	14	21	0	9	0	1	3
			50 - 54	45	20	14	2	5	0	0	4

	House tenure									
	Total	**Owned**	**Private Rented\Leased**	**Government Rented\Leased**	**Rent free**	**Squatted**	**Other (Please Specify)**	**Not Stated**		
	Count	Count	Count	Count	Count	Count	Count	Count		
			55 - 59	79	50	23	2	3	0	1	0
			60 - 64	74	55	14	0	2	0	0	3
			65 and over	288	225	39	1	13	0	2	8
	Male	5 Year Age Groups	Total	318	188	93	1	20	0	2	14
			0 - 4	0	0	0	0	0	0	0	0
			5 - 9	2	0	0	0	2	0	0	0
			10 - 14	0	0	0	0	0	0	0	0
			15 - 19	3	1	1	0	0	0	0	1
			20 - 24	3	0	0	0	1	0	0	2
			25 - 29	9	3	3	0	2	0	0	1
			30 - 34	12	4	3	0	3	0	0	2
			35 - 39	16	5	7	0	1	0	1	2
			40 - 44	34	13	20	0	1	0	0	0

	House tenure									
	Total	**Owned**	**Private Rented\Leased**	**Government Rented\Leased**	**Rent free**	**Squatted**	**Other (Please Specify)**	**Not Stated**		
	Count	Count	Count	Count	Count	Count	Count	Count		
			45 - 49	22	7	11	0	2	0	0	2
			50 - 54	20	8	8	0	3	0	0	1
			55 - 59	40	28	12	0	0	0	0	0
			60 - 64	33	26	7	0	0	0	0	0
			65 and over	124	93	21	1	5	0	1	3
	Female	5 Year Age Groups	Total	359	220	89	4	26	0	3	17
			0 - 4	2	1	0	0	0	0	0	1
			5 - 9	1	0	0	0	1	0	0	0
			10 - 14	0	0	0	0	0	0	0	0
			15 - 19	2	1	1	0	0	0	0	0
			20 - 24	2	0	2	0	0	0	0	0
			25 - 29	6	1	4	0	1	0	0	0
			30 - 34	15	4	10	0	1	0	0	0

	House tenure										
	Total	**Owned**	**Private Rented\Leased**	**Government Rented\Leased**	**Rent free**	**Squatted**	**Other (Please Specify)**	**Not Stated**			
	Count	Count	Count	Count	Count	Count	Count	Count			
			35 - 39	19	7	10	0	0	0	0	2
			40 - 44	17	4	10	0	1	0	0	2
			45 - 49	26	7	10	0	7	0	1	1
			50 - 54	25	12	6	2	2	0	0	3
			55 - 59	39	22	11	2	3	0	1	0
			60 - 64	41	29	7	0	2	0	0	3
			65 and over	164	132	18	0	8	0	1	5
Source: Barbados Statistical Service Population and Housing Census, 2021											

Female-headed households in the Direct Area of Influence. Of 667 household heads recorded in Table 45, 347 (52.0 percent) are women. Female headship is concentrated in older age: 161 female heads are aged 65 and over and 238 (69 percent) are 55 and over, against 204 of 320 male heads. Only 58 households record a male spouse or partner, so most female-headed households have no partner present, and the typical female-headed household of the area is an older woman, often living alone or with adult children, on a pension or a single income. Tenure does not follow the expected pattern: female heads are not over-represented among renters. Of 359 female heads in Table 46, 61.3 percent own their dwelling, 24.8 percent rent privately and 7.2 percent live rent-free, against 59.1 percent owning and 29.2 percent renting among male heads. Female renters are concentrated in the 25 to 49 age band (44 of 89), the working-age women most exposed to rent and price pressure from a non-local workforce, while 132 of the 164 female heads aged 65 and over own their homes. The household survey of April 2026 reached 14 female-headed households (18 percent of 79), 12 older persons living alone and 9 tenant households. The two census tabulations count 667 and 677 heads respectively because Table 46 includes heads whose relationship was not stated; the figure of 667 is used for headship and 677 for tenure.

Sensitivity to short-term shocks. The groups sensitive to the construction period are therefore two: older women heading their own households on fixed incomes, exposed to nuisance, health effects and any rise in the cost of transport and food; and working-age women renting privately, exposed to rent increases if the non-local workforce or its subcontractors compete for local accommodation. A rental survey has not been undertaken; asking rents for long-term two-bedroom units on the south coast in late 2026 ranged from about BBD 2,350 a month in Oistins to BBD 3,000 in Maxwell, with one-bedroom units at Worthing below that (agency listings, Barbados Property Search and Terra Caribbean, accessed November 2026), which is an indicative range rather than a baseline; the Social Management Plan (Section 8.4.15) commits to establishing a rental baseline before camp occupation and monitoring it semi-annually, with targeted communication and GRM outreach to female-headed and renter households.

6.8.10. Community-Level Socio-Economic Profile

The socio-economic material presented above is drawn largely from national statistics. National data establish the context within which the project operates but they do not describe the communities within the DAI, and the Social Impact Assessment requires the latter. This sub-section sets out what is established about those communities from the field exercise of 15 to 18 April 2026, and states plainly what is not yet established and how it will be closed. The household field data collection activity conducted and described in Section 7.5.1.complements the information outlined in this section by updating engagement with the community while also expanding the range of focus[76]. This activity was done over a two week period, engaging communities in Harmony Hall, Dover, Rendezvous Ridge and Amity Lodge, expanding the range and validating and capture new information.

What is established. Fifty households were identified within the direct Area of Influence during the field exercise, in the Harmony Hall area and along the community road serving it. The community is mixed in use, combining residential occupation, small business activity and agriculture within the same area. Tourism and its related services are the principal drivers of economic activity, alongside agriculture and services, mirroring the national pattern. Two private medical facilities and two educational institutions

[76] To complement the field exercise that occurred in April 2026, enumerators conducted household field data collection over two week period (September 28th – October 8th), using Kobotoolbox to capture data. 79 respondents were obtained.

lie within proximity, as described in the Social Infrastructure section. For the avoidance of doubt, the fifty households lie within the socio-economic catchment of 1 km, which the April 2026 engagement was designed to cover, and not solely within the 500 m direct Area of Influence.

What is not yet established. The field exercise did not capture household composition, tenure, or the split between owner-occupied dwellings and properties let to visitors, which matters because competition for rental accommodation is one of the mechanisms by which a non-local workforce affects a host community. Nor did it capture local unemployment, the principal livelihoods pursued within the community, local income or poverty levels, or prevailing rental values against which any inflationary effect could later be measured. The engagement was conducted on a convenience basis rather than by a sampling frame, so the fifty households identified cannot be treated as a representative sample of the community.

That gap has since been closed by other means. A household profile of the DAI was undertaken as part of the Community Health Assessment, covering household composition, tenure, livelihoods, employment status and current rental values. The profile covers the socio-economic catchment of 1 km, consistent with the structure set out in the Project's DAI section. The Community Health Assessment and Community Health Plan profiles the DAI from census data rather than from the field exercise and gives both the household tenure structure and the population by age band and sex. Six hundred and seventy-seven households are recorded in the area, of which sixty percent are owner-occupied, twenty-seven percent privately rented or leased, seven percent occupied rent free, and under one percent government rented. The rental proportion is the figure that matters for labor influx: roughly one household in four in the area holds its home on a tenancy, and those households are the ones exposed if a non-local workforce competes for rental stock or if landlords convert to short-term letting.

The population profile is set out at Table 47. Two features bear on the assessment. Women outnumber men in every age band above twenty-five, and the imbalance widens with age, so the older population of the Area of Influence is predominantly female. The twenty-five to fifty-four band is the largest at thirty-one percent, which is the group most likely to be in the labor market and therefore most affected both by the employment opportunity and by competition for it.

Table** 47**: Population of the Area of Influence by age band and sex

Age band	Total	Male	Female	Share of area population
0 to 14 years	217	112	105	12.9%
15 to 24 years	169	93	76	10.1%
25 to 54 years	514	243	271	30.6%
55 to 64 years	257	109	148	15.3%

The fifty households identified during the April 2026 field exercise are a subset of this population, i.e., those in the Harmony Hall area and along the community road immediately serving the site. The two figures are not in conflict: fifty is the DAI walked in the field, six hundred and seventy-seven is the wider area profiled from census data. The distinction should be preserved wherever either figure is used.

The nearest residential receptor is approximately two hundred and fifty meters to the south-east of the site and is assessed in the Community Health Assessment as of high sensitivity, exposed to particulates, noise, odor and vehicle movements. That distance and that rating govern the noise and dust commitments in the Environmental and Social Management Plan.

The labor force participation rate is 63.3%. 57.4% of the Population of Barbados is recorded as being employed, while 4.9% are unemployed (Services). The working poverty rate is recorded at 0.3% in 2025[77]. The Central Bank of Barbados reports that unemployment declined to its lowest level in recent history, reinforcing business confidence and household spending[78]. Building on this resilience, the economy is forecasted to sustain around 3 percent annual growth beyond 2025, supported by tourism diversification, public and private investment in infrastructure and housing, expansion of the digital economy, and targeted productivity reforms. Together, these drivers reinforce a confident outlook for continued, inclusive growth through 2025 and beyond *(Central Bank of Barbados, 2025)*.

Vulnerable groups within the 1 km catchment. The groups that project activities affect differently from the general population, with their local counts, are set out in Section 6.8.14 (Vulnerable groups with gender dimensions). Construction traffic, noise and dust fall hardest on the older, home-based and predominantly female daytime population; labor influx and worker movement on women and girls at the camp interface, bus stops, shops and the Gap; bypass and odor events on all residents but with the heaviest health consequence for the old. Each group is carried into the Gender and Social Assessment (Section 7.6.4) and into the targeted engagement, information formats, safe pedestrian routes, employment outreach and GRM adaptations of the Stakeholder Engagement Plan, Traffic and Pedestrian Management Plan, Labor Management Plan and Grievance Redress Mechanism.

6.8.11. Local Service Capacity

There are two medical facilities within proximity to the Workers' Camp. These include Maxwell Medical Clinic and Elcourt Clinic. These institutions are privately owned; they operate Monday through Sunday, providing a range of general and family health services. The two clinics operate on weekdays and at limited weekend hours and provide general outpatient care; neither offers a twenty-four-hour emergency service. The nearest hospital is the Queen Elizabeth Hospital in Bridgetown, approximately 7 km or 4.3 miles from Harmony Hall and ordinarily fifteen to twenty minutes by road, which provides twenty-four-hour emergency care and post-incident care for survivors of sexual violence. Also, there are three police stations close to the project site: Oistins Police Station, Worthing Police Station, and District 'B' Police Station. The nearest stations of the Barbados Police Service, their hours and contact numbers, together with the Family Conflict Intervention Unit, national helplines, shelters and non-governmental support services, are listed in the referral pathway carried in the SH/SEA/GBV Prevention and Response Plan and recorded in Table 189. The implication for the project is that serious injury, obstetric emergency or any incident requiring immediate specialist care must be routed to Bridgetown rather than treated locally, which is reflected in the Emergency Response Plan and in the on-site first-aid provision.

[77] ILO. (n.d.). Barbados. Accessed at https://ilostat.ilo.org/data/country-profiles/brb/ (International Labour Organization, n.d.)
[78] Central Bank. (2023). Who Really Counts as Unemployed? https://youtu.be/8O74GrRrCM0?feature=shared

Accessibility for women and girls. Seen from the position of a woman in Harmony Hall without her own transport, the service picture is thin. The two private clinics are reachable on foot but charge consultation fees, keep office hours and do not handle emergencies; neither is known to operate a protocol for gender-based violence cases. Public primary care is at the Randal Phillips Polyclinic in Oistins, which runs extended hours for urgent and routine care on weekdays from 16:30 to 20:30 (Government Information Service, n.d.), and emergency, post-rape and forensic care only at the Queen Elizabeth Hospital, 7 km away, which after dark means a taxi fare or a wait for a bus. Three police stations serve the area, at Oistins, Worthing (24 hours, 246-628-4150) and District B, but reporting of sexual offences to the police is low nationally and lower still among women in informal work or without secure status; the specialist Family Conflict Intervention Unit is in Bridgetown. Psychosocial support, shelter and legal aid (SAVE Barbados, the Business and Professional Women's Club Crisis Centre and shelter, the Legal Aid Clinic) are all outside the area and, except for the 24-hour telephone lines, keep daytime hours. Two gaps follow for the Project. There is no 24-hour health service within the catchment, the nearest public evening service closes at 20:30, and no local provider is known to operate a GBV protocol. The Grievance Redress Mechanism and the SH/SEA/GBV Prevention and Response Plan are aligned to that reality: a confidential channel open at all hours, transport to the hospital or a shelter provided on the survivor's request, a referral protocol agreed with the Family Conflict Intervention Unit before mobilization, and no requirement to report internally before reaching an external service (Sections 8.4.9 and 8.4.12; referral directory at Table 111). Travel times and fees for each service are to be confirmed by field verification before construction begins.

6.8.12. Social Infrastructure

6.8.12.1. Governance

Barbados operates a parliamentary democracy without elected local government, relying instead on appointed Constituency Councils (CCs) to deliver local governance. In 2021, Barbados transitioned to republican status, electing its first President to replace the British monarch as Head of State. The country is divided into 11 parishes plus Bridgetown, further subdivided into 30 constituencies, each with its own council under the oversight of the Department of Constituency Empowerment (DCE) in the Ministry of Social Care.

Each CC is a legally established body of 11 appointed members, including a chairperson and treasurer, with the local Member of Parliament serving ex officio. Councilors serve two-year terms, renewable once, and are selected through an application process tied to their residence or community association[79].

Councils receive a fixed annual allocation of BB$100,000, representing about 0.07% of total government expenditure, and in 2010, women comprised 40.7% of councilors and 16.7% of chairpersons[80]. Councils function as advocacy and resource management bodies, maintaining links with government agencies, lobbying on behalf of constituents, and delivering projects tailored to local needs.

[79] Government of Barbados. (2009). Constituency Councils Act, Cap. 4. Laws of Barbados. https://www.barbadosparliament.com
[80] Urban and Cities Platform. (2020). Urban municipal financing system of Barbados. https://urbanplatform.org

Through sub-committees, CCs gather socioeconomic data, identify priorities, and implement initiatives, ranging from community-level projects to larger undertakings in partnership with the DCE and other stakeholders. Their mandate emphasizes good governance, efficient resource use, and community empowerment, positioning CCs as the primary mechanism for local representation and development in Barbados (Commonwealth Local Government Forum). Barbados generally performs above regional averages on most governance indicators such as rule of law, control of corruption, and political stability.

6.8.12.2. Water

As previously noted, Barbados is water-scarce, with per capita availability of 306 m^3/year. Nearly 80% of supply comes from fragile coastal aquifers, yet the island maintains a historic water network (1856) with 99% coverage and quality standards aligned to WHO guidelines. With 98% of groundwater fully developed and droughts increasing, challenges include reduced supply in high-elevation areas and rising coastal salinity (Bradshaw, 2023).

The Barbados Water Authority (BWA), established in 1980, manages potable water, wastewater treatment, and resource protection[81].

Groundwater supplies approximately 80 to 86 percent of the public water supply, with the remaining 14 to 20 percent produced by the Brighton seawater desalination plant, commissioned to supplement groundwater during periods of scarcity (Barbados Water Authority, 2025). Around half of the groundwater abstraction is drawn from two wells operating close to capacity, and some 120 privately owned wells supply irrigation.

Agriculture is the largest single consumer of water. The consumption shares previously cited in this section derive from 1996 Barbados Water Authority figures and are approximately thirty years old; they are retained only as historical context and are not relied upon in the impact assessment. Current sectoral consumption data should be obtained from the Authority before submission. A $37.5M desalination plant at Spring Garden (2000), serving 44,000 people (~1/6 of the population)[82].

The quality of the water supply in Barbados meets the World Health Organization's drinking water guidelines which the island has adopted as its drinking water standards. Water quality is safeguarded by the Bridgetown (1982) and South Coast (2003) wastewater treatment plants, alongside the Spring Garden reverse osmosis facility. Reservoirs at Golden Ridge, Castle Grant, and Spring System support irrigation in parishes such as St. Andrew, St. John, St. Joseph, and St. Thomas areas facing chronic shortages.

Climate change and El Niño have intensified droughts, placing Barbados among the top 10 water-stressed countries. Rising costs of living have spurred household kitchen gardens, increasing demand.

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[81] Barbados Water Authority. (n.d.). About Us. Accessed at https://barbadoswaterauthority.com/about-us/ (Barbados Water Authority, n.d.)

[82] Totally Barbados. 2025. Barbados Water. Accessed at https://www.totallybarbados.com/articles/infrastructure/water/ (Totally Barbados, 2025)

In 2016, BWA imposed a three-month water ban restricting non-essential uses. Long-term measures include:

- Eight water tankers for St. Joseph, St. Andrew, and St. John.
- Rehabilitation of a St. George well to add 500,000 gallons to Golden Ridge and Castle Grant.
- Completion of Lazaretto pumping station to channel desalinated water into St. Peter and St. Lucy.

Barbados' water governance reflects a balance of historic infrastructure, modern desalination, and adaptive drought strategies, but remains constrained by aquifer fragility and climate pressures.

6.8.12.3. Energy

The island's electric utility, The Barbados Light & Power Co. Ltd. (BLPC), established in 1899, was one of the earliest in the Caribbean. It is a vertically integrated monopoly, regulated by the Fair- Trading Commission (FTC), and is now totally owned by Emera Inc., a Canadian based company. Their existing license, which was gained in 1986, allows BLPC to have the sole franchise to sell electricity in Barbados up to 2028. Recent efforts in securing a more sustainable energy mix provide reason for optimism. The establishment of photovoltaic projects throughout the island in the last five years has led to many new players either getting involved or expanding in the market. The local utility has also played its part by establishing a 10 MW solar farm. The government has set a distributed generation target of at least 35,000 buildings with rooftop or ground-mounted solar PV systems that are resilient to extreme wind events (e.g. Category 4 Hurricanes).

While wind energy has not taken off significantly, there are plans to develop this technology to complement existing solar installations. BLPC continues to investigate the possibility of establishing a wind farm in Lambert's, St. Lucy alongside the existing PV farm there.

In light of a declining sugar cane industry on the island, there is increasing confidence in the agricultural sector that there can be greater use of biomass and biogas in the energy sector. Bagasse has, at times, been used to generate energy in the sugar cane industry and there is considerable interest in building on this experience, with some farmers considering switching to high fiber canes to produce biomass rather than sugar.

Natural Gas is used for Domestic Cooking and Industry. The National Petroleum Corporation (NPC) currently has approximately 22,000 customers of which approximately 1,000 are commercial entities. There is continued demand for piped natural gas for cooking as an alternative to liquified petroleum gas (LPG), influenced by the current pricing mechanism for natural gas and convenience[83]. Similarly, industries use natural gas as the fuel source for their boilers. Current demand for natural gas is approximately 1.7 million cubic feet per day (approximately half of which is now imported as domestic supply has declined). It is noted that the National Petroleum Company plans to expand the natural gas distribution network. To achieve the 2030 Vision of zero fossil fuel consumption domestically, it will be

[83] Barbados National Energy Company Ltd. (2023). Natural Gas – Residential Customers. https://www.barbadosnationalenergy.com

necessary to switch from piped natural gas to a piped biogas if the distribution network is not to become a stranded asset[84].

The demand for energy in Barbados over the last ten years is characterized by a declining trend. The average demand of primary and secondary energy was estimated at 11,297 BOE per day. Energy demand over the period declined, reflecting the economic challenges that Barbados has been facing. Barbados' demand for energy peaked in 2008 at an estimated 12,056 barrels of oil per day (BOPD), while the lowest level of demand was observed in 2014, estimated at 10,132 BOPD[85].

Currently, fossil fuels, predominantly heavy fuel oil, dominate Barbados's energy mix: • Heavy Fuel Oil – 37% • Diesel - 18% • Gasoline – 17% • Kerosene – 7% • LPG – 2% • Sugar Cane Bagasse – 3% • Natural Gas – 2% • Other (electricity produced within utility) – 14% • Solar water heaters - < 1% The heavy fuel oil is mainly used in the generation of electricity.

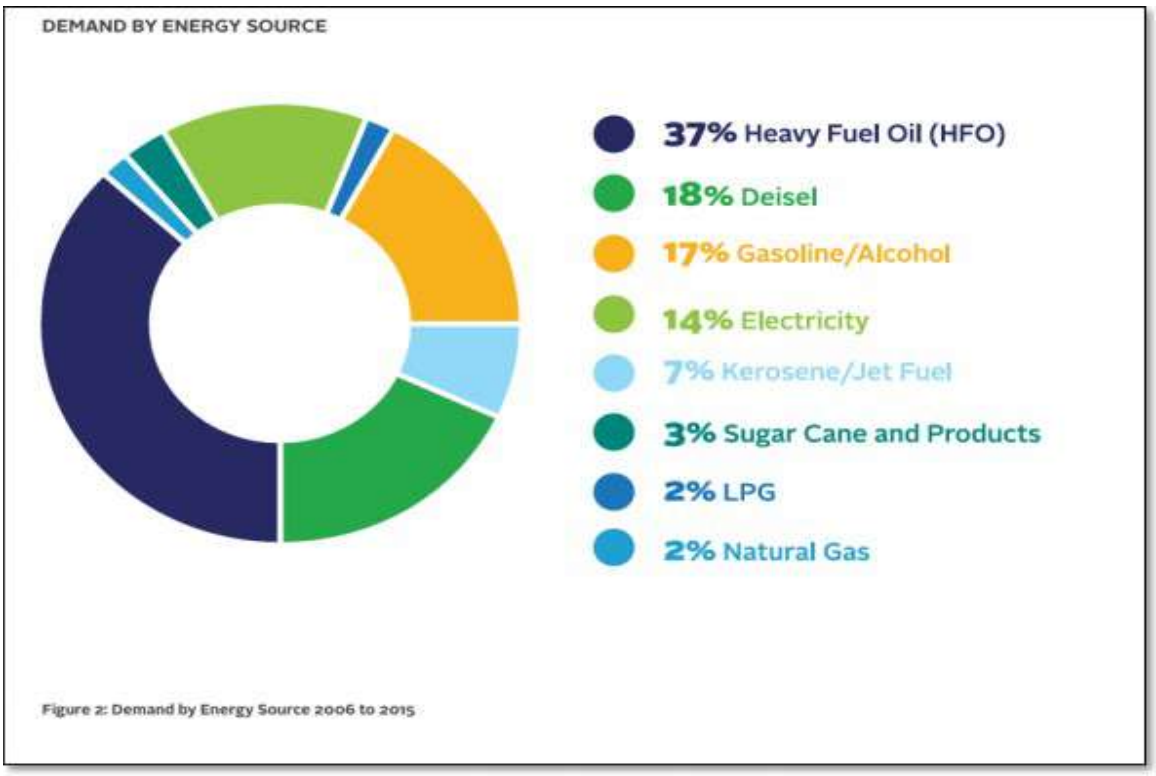


Figure 56**: Demand by Energy Source 2006 to 2015**

Energy demand by source between 2006 and 2015 is shown at Figure 56, and electricity sales by demand group at Figure 57.

Natural gas is not a significant contributor in the energy sector, adding only 2% to the energy mix. However, its widespread use in Barbados for (domestic) cooking, and various activities in the tourism and industrial sectors, has had a considerable social impact. The benefit of this fuel source is that it is less carbon intensive than other fossil fuels. However, it is still a fossil fuel, and its use without carbon

[84] Government of Barbados, Ministry of Energy and Business. (2019). Barbados National Energy Policy (2019–2030). https://energy.gov.bb

[85] BP. (2024). Statistical Review of World Energy – Barbados country data. Energy Institute. https://www.energyinst.org/statistical-review

capture and storage is unsustainable in the context of climate change. The use of solar water heaters for domestic water heating has also risen significantly since 1974. However, its effect on the overall energy mix is still under 1%.

Electricity consumption over the last ten years was distributed as follows: • Domestic – 33% • Commercial – 21% • Public – 16% • Tourism/Hotel – 15% • Industrial – 9% • Other – 6%[86].

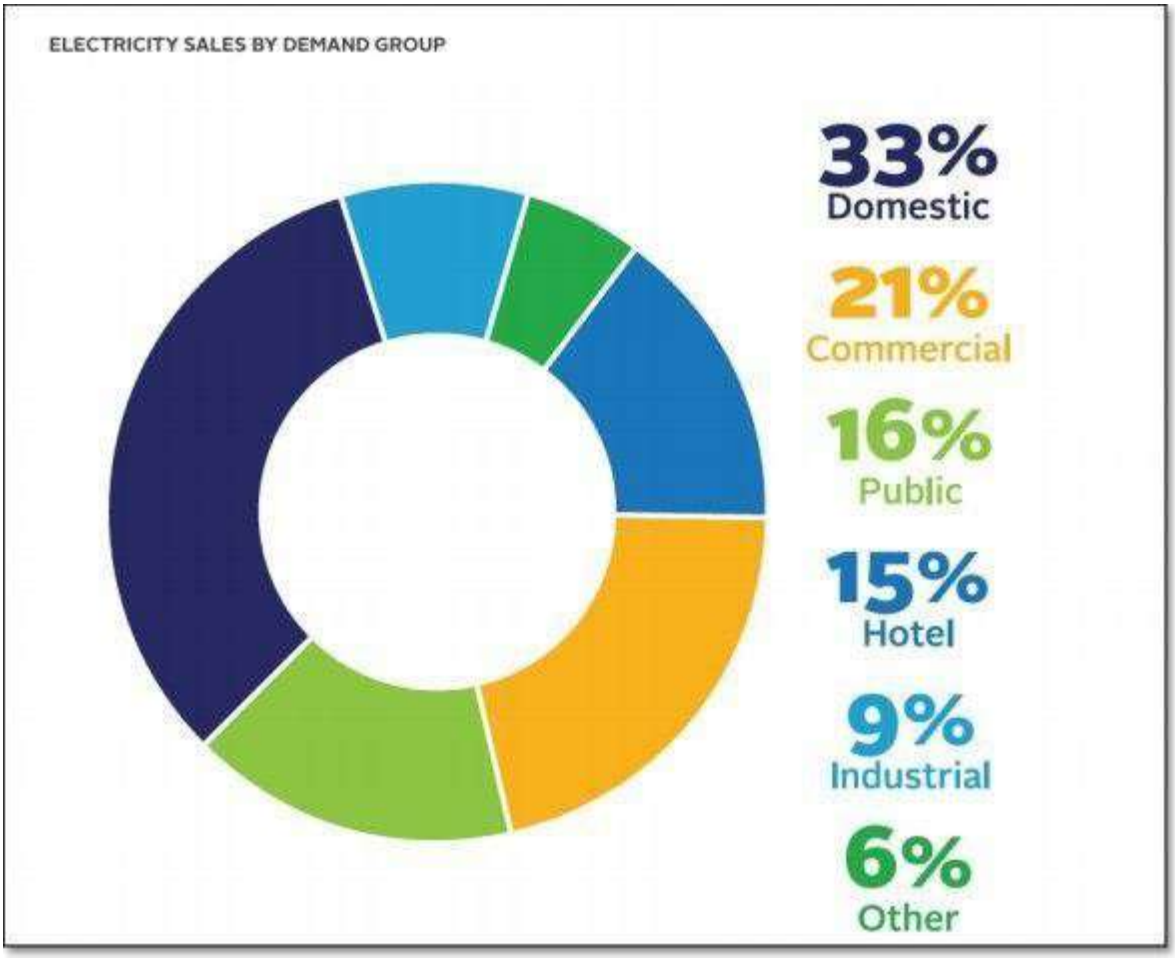


Figure 57**: Electricity Sales by Demand Group**

The average consumption for electricity in Barbados during the period under consideration is 926.8 MWh. Electricity is central to economic output in Barbados and brings significant value to the country from a social perspective. The social cost of the production of electricity was estimated to be $0.06 for every dollar earned from the production and distribution of electricity, and the Barbados economy produced on average, BDS$8.00 from every kWh produced and distributed[87].

The BNEP seeks to build on the value that the electricity sector brings to Barbados by introducing the appropriate energy sources and ensuring that the highest level of efficiency in electricity generation from these sources is achieved and maintained. This focus and the resulting activities will be important in

[86] Caribbean Centre for Renewable Energy and Energy Efficiency (CCREEE). (2023). Barbados Energy Report Card. https://ccreee.org

[87] Mercer-Blackman, V., Mooney, H., Aiello, R. G., Graham, M., Saboin, J. L., Mazzocca, A., Hernaiz, D., Mitchell, T. K., Hussain, L., Gauto, V., Ivey, W. G., Castilleja Vargas, L., Suliman, N., Okey, O., & Satnarine-Singh, N. (2026). The Price of Power: How the Caribbean Can Build a More Secure Energy System. Caribbean Economics Quarterly, 16(1). Inter-American Development Bank. https://doi.org/10.18235/0014057

improving the sustainability of the electricity supply. Additionally, the policy will attempt to provide a balance between the interests of society and those of the electricity producers. Barbados intends to steadily increase its share of renewable energy in the local market, widening the diversification of energy resources, promoting energy security and eliminating the reliance on imported fossil fuels, which is now based on about 90% imported resources.

However, an analysis conducted by the MEWR suggests that this target could lead to high electricity prices if only solar PV installation is undertaken. There may be a more sustainable mix of renewable energy resources which will lead to a reduced long-term cost. Possible ways for achieving this target were identified as increased use of renewable energy technologies such as waste to energy, biomass, cogeneration, wind energy, solar photovoltaic and solar thermal. The Government has increased its efforts to achieve increased energy efficiency and sustainability by promoting energy efficient technologies and its vision of "green economics," which provides incentives to the public to be energy efficient. Barriers to this sustainability effort have been identified as limited access to capital, lack of detailed regulations, limited access to technology and lack of grid connection rules. The BNEP further considers these issues as it seeks to provide strategies for overcoming some of the limitations to sustainable development in Barbados (Ministry of Energy and Water Resources, 2019).

6.8.12.4. Transportation

Barbados' public transport system is a hybrid of state and private operators, ensuring island-wide coverage. The Transport Board, established on August 24, 1955, by Act of Parliament under Governor Sir Robert Duncan Harris Arundell, KCMG, consolidated (took over) fragmented private concessionaire services. By September of that year, the Government had assumed control of 116 buses from eight concessionaires, forming the backbone of a new state-owned enterprise.

71 years later, the Transport department still continues to oversee a fleet of buses. In keeping with the country's growth plan and sustainability agenda, amidst climate and energy nuances, the Country has transitioned its public transport fleet by procuring 300+ electronic buses. This move is set to help Barbados achieve its 2030 Vision, to eliminate diesel and gasoline in local transport. Centrally lowering operating costs, reducing emissions, and enhancing competitiveness. Plans are afoot to install electric vehicle charging ports across the country, as well as to train a cadre of technicals to support the sustainability of the electronic transport fleet.

The transport infrastructure includes three main terminals (Fairchild Street, Bridgetown; Princess Alice Highway, St. Michael; Speightstown, St. Peter), a central depot at Mangrove, St. Philip, a sub-terminal at Oistins, Christ Church, and headquarters at Roebuck Street, Bridgetown.

Private suppliers of transport operate licensed minibuses and taxis referred to as ZRs. They operate pre-determined routes under the transport Authority. It is important to note that all major roads are served by taxis, buses, minibuses, and ZRs. While many routes connect via Bridgetown's central terminals, some Transport Board services run direct routes, reducing transfers.

Local access and differential effects. The national systems described above reach the catchment unevenly. The catchment is served by the Barbados Water Authority network, but the 2016 restrictions

show that drought-period rationing falls first on households without storage, and any construction damage to the distribution network serving Harmony Hall would interrupt supply to households where an older woman is at home all day. Electricity supply is island-wide and the Project's own demand does not affect household supply or bills; the camp's solar provision is relevant to lighting of the camp perimeter and access route rather than to residents' supply. Transport is the system that matters most. In Christ Church 37.8 percent of households have no private vehicle (Pacific Disaster Center, 2024), and women, older people and schoolchildren in the catchment travel by bus and ZR along the community road and the ABC Highway corridor and on foot to the bus stops, the clinics and the shops in Worthing and the Gap; men are more likely to drive. Construction traffic on the single access route, worker transport at shift change and reduced lighting after dark therefore affect women's and children's safety and access disproportionately, which is why the Traffic and Pedestrian Management Plan (Section 8.4.6) sets movement windows that avoid school travel times, marked crossings, speed limits and lighting of the access road, and the Community Health Plan (Section 8.4.10) carries worker transport rules.

6.8.13. Crime and Violence in Barbados

In Barbados, violent crimes tend to occur between members of rival crime groups (Barbados Today, 2025)[88]. Crimes of opportunity, such as petty larceny, burglary, automobile break-ins, as well as incidents of violent crime, such as murder, sexual assault, robbery, shootings, and drug-related crimes, do occasionally occur (Overseas Security Advisory Council, 2025).

Tourism is a major contributor to the Barbadian economy. Tourists are urged to exercise caution when traveling at night around Barbados, due to the prevalence of unmarked and unlit roads, and petty theft being a risk for their safety.

The United Nations Office on Drugs and Crime reports that violent crime, substance abuse, gender-based violence, firearm, and drug trafficking are significant concerns in Barbados. Porous borders and strategic geographical location pose challenges to law enforcement in combatting and intercepting the illegal trafficking of drugs and firearms, which fuel insecurity at the national level. Further, the UNODC identified several communities in hot spot areas in St. Michael and Christ Church, where crime, drugs, and violence were prevalent (United Nations Office on Drugs and Crime). Among the youth population, alcohol and marijuana are widely consumed and are believed to be a contributing factor in violence and suicide.

Human trafficking is prevalent but silent in Barbados, with Barbados deemed as one the main transit grounds for trafficking in the It often involves sex and labor exploitation of women and girls, with the majority coming from other Caribbean islands and some Latin American territories like Venezuela. Sex tourism is also a major market in Barbados. As it relates to migration, the risk of sex and labor exploitation is dependent on a number of variables and may often result is practices such as document retention and movement restrictions. The counterfeit goods trade is active in Barbados. Counterfeit luxury items and watches are frequently sold through informal channels by street vendors and via online platforms like

[88] Barbados Today. (2025). Police Pledge Comprehensive Crackdown on Gangs. https://barbadostoday.bb/2025/06/24/police-pledge-comprehensive-crackdown-on-gangs/#google_vignette

Facebook and Instagram. While the market is limited in scale, the enforcement of intellectual property rights in Barbados for such tends to be weak.

Barbados is considered one of the Caribbean's transit and consumptions hubs for drugs, with marijuana and cocaine being the most prevalent of drug seizures by local authorities (Barbados Drug Information Network, 2023)[89]. The Drug Abuse (Prevention and Control) (Amendment) Act 2019 removed possession of up to 14 grams from the ordinary criminal process, substituting a fixed penalty, and cultivation of up to four plants at a private residence for personal use is treated in the same way. Sale, trafficking and possession above the threshold remain criminal offenses. In 20219, the Medicinal Cannabis Industry Act established the Barbados Medicinal Cannabis Licensing Authority. The Sacramental Cannabis Act 2019 permits the cultivation and use of cannabis by certified members of the Rastafarian community, but only for religious purposes. In contrast, the cocaine trade is prevalent in Barbados. The country is a transit point, though not a major one, for regional cocaine trafficking. Recent cocaine seizures indicate a partially consolidated market, with trafficking linked to Venezuela. Heroin use in Barbados is less prevalent than that of marijuana and cocaine use and is more likely to be consumed with transient populations, including tourists.

The arms trafficking market in Barbados has grown in recent years, and possibly as a result as the aforementioned rivals between gang members. Most firearms are said to originate from the United States. Recent arrests and observations, including the seizure of both firearms and drugs suggest a potential convergence of these markets on island. The gang presence in Barbados ranges from criminal activities, including drug and arms trafficking, robbery, and violence. These gangs operate under structured leadership, with concerns about the recruitment of vulnerable children, both boys and girls. Recent efforts to address violence in Barbados include discussions between government officials and prominent gang members aimed at establishing a truce and reducing violence, particularly gun-related incidents, backed and supported by reputable figures in Barbadian society. There have also been whispers of connections with regional criminal networks, suggesting a transnational influence on their gang activities. The criminal networks in Barbados have primarily engaged in the trafficking of firearms, drugs, as well as human trafficking in some cases, even though concrete evidence remains unclear.

Reports as well as arrests suggest that low-level officials accept bribes and large sums of money to facilitate trafficking and other illegal operations. Indications also show that some politicians may be influenced by gang leaders. Recent reports also highlight state actors' involvement in financial crimes. Similarly, foreign actors play a notable role in criminal markets, including human trafficking, arms smuggling and drug trafficking. In the Barbados, drug trafficking, is largely controlled by foreign actors.

Barbados continues to work to actively address organized crime, through both international cooperation and domestic efforts. The country has renewed its commitment to combat maritime trafficking of illegal drugs and firearms and has signed several key global agreements. Nonetheless, concerns remain over issues including regarding the ongoing gang violence, with a significant spike from 2024, and slow criminal prosecution times supposedly due to court backlogs, while cases for cannabis possession

[89] Barbados Drug Information Network. (2023). Barbados Drug Information Network Report 2023. https://www.ncsa.gov.bb/Download.ashx?file=Attachments%2FBARDIN+2023+Report.pdf&disposition=inline&name=Barbados+Drug+Information+Network+-+Report+2023+Data+

seem be swiftly prosecuted. In response, a National Advisory Council on Citizen Security was established to counteract these issues (Barbados Today, 2024)[90]. Dedicated gun courts have been suggested as a solution to address firearm backlog in the judiciary system by Minister of Legal Affairs and Criminal Justice, Michael Lashley (Caribbean Broadcasting Corporation, 2026)[91].

Barbados continues to grapple with organized crime, particularly the activities of gangs such as Dawg Pound, Red Sea, and The Dungeon (Ocindex, n.d)[92]. These groups, while not controlling territory in the way that gangs in other regions might, operate under structured leadership and are implicated in drug trafficking, arms smuggling, robbery, and violent crime. Their recruitment of vulnerable youth has raised serious concerns among policymakers and civil society. Despite these challenges, there have been attempts at dialogue among gangs to reduce violence, especially gun-related incidents, though the effectiveness of these efforts remains uncertain (Barbados Today, 2023)[93].

Transnational connections further complicate the picture. Barbados serves as a transit hub for cocaine and cannabis, with Venezuelan nationals frequently implicated in maritime shipments. European actors, including nationals from the UK and Norway, have been linked to smuggling networks that connect Latin America, the Caribbean, and Spain. Arms trafficking is largely driven by US-sourced weapons, with American nationals profiting from the trade and laundering proceeds abroad. These dynamics underscore the island's vulnerability to external criminal influences.

State-embedded actors also play a role, though their influence appears limited rather than systemic. Reports suggest that low-level officials accept bribes to facilitate trafficking operations, while some politicians may be susceptible to gang influence (Ocindex, 2025)[94]. Financial crimes involving state actors have also been reported, raising questions about integrity and accountability.

In response, Barbados has enacted several legislative measures (Nation News, 2026)[95]. The Firearms Amendment Act (2023) increased penalties for gun offenses, while the Cybercrime Bill (2023) strengthened international cooperation against digital crime. The Bail Bill (2024) restricted bail for serious offenders, and new maritime legislation introduced in 2024 streamlined border procedures to prevent illegal entry. Cannabis possession was decriminalized in 2019, though intellectual property enforcement remains weak, with Barbados still on the US Watch List.

International cooperation has been central to Barbados' crime-fighting strategy. The country participates in the PACE Justice Program, working with the EU, UNDP, US, and UK to reduce judicial backlogs (UNDP, 2024)[96]. It has also collaborated with Trinidad and Tobago, the US, and the UK to combat arms and drug trafficking. In 2024, Barbados hosted a major crime-fighting dialogue, reinforcing its role in regional policing efforts.

[90] Barbados. (2024). Government sets up national advisory council on citizen security. https://barbadostoday.bb/2024/09/19/government-sets-up-national-advisory-council-on-citizen-security/

[91] Caribbean Broadcasting Corporation. (2026). Gun courts expected to reduce firearms case backlog. https://www.cbc.bb/main-stories/gun-courts-expected-to-reduce-firearms-case-backlog/

[92] Global Organized Crime Index. (n.d.). Barbados Country Profile. https://ocindex.net/country/barbados?utm_source=copilot.com

[93] Barbados Today. (2023). Firearms Amendment Act comes into effect January 1. Barbados Today. Retrieved from https://barbadostoday.bb

[94] Global Initiative Against Transnational Organized Crime. (2025). Global Organized Crime Index: Barbados. ENACT/ISS/INTERPOL. Retrieved from https://ocindex.net/country/barbados

[95] Nation News. (2026). Gang legislation debate intensifies in Barbados. Nation News Barbados. Retrieved from https://www.nationnews.com

[96] UNDP. (2024). PACE Justice Programme: Strengthening justice systems in Barbados and the Caribbean. UNDP Barbados and the Eastern Caribbean. Retrieved from https://www.undp.org/barbados/projects/pace-justice

Domestically, the government has created a Serious Organized Crime Unit to tackle gang violence and drug trafficking, though concerns have been raised about its resource demands and potential for corruption. Police outposts established in 2023 helped reduce crime in certain areas, and the Barbados Coast Guard continues to play a critical role in maritime security (Nation News, 2026)[97].

Despite these efforts, systemic weaknesses persist. The judicial system suffers from lengthy prosecution times and outdated procedures, while prison overcrowding and abuse remain unresolved. Public perception of corruption continues to erode trust, even as Barbados is recognized as a regional leader in anti-corruption reforms, including new legislation requiring cabinet members to declare assets (Transparency International, 2024)[98].

Overall, Barbados has made significant strides in addressing organized crime and corruption through legislation, international cooperation, and institutional reforms. Yet challenges such as gun violence, transnational trafficking, and judicial inefficiencies highlight the need for more comprehensive crime prevention strategies.

Implications for the Project. The national picture translates into three project-specific risks. First, proximity: the camp and the plant sites lie within the Christ Church south coast strip in which UNODC and the Royal Barbados Police Force have identified crime hot-spot communities, and within walking distance of St. Lawrence Gap, the island's principal nightlife district and the setting of the sex tourism economy described above; from the site coordinates recorded in Annex G, the western end of the Gap at Dover lies about 0.6 km and the main strip about 1 km from the site, ten to fifteen minutes on foot, to be confirmed on the ground. Second, exposure: a male, non-local resident workforce of 120 with disposable income, adjacent to a residential community and a nightlife economy, is the standard configuration for sexual exploitation, transactional sex and harassment of local women and girls, and for exploitation of migrant and informal women workers, as well as for workers themselves becoming targets of robbery or drug and alcohol-related violence. Third, trafficking: the documented presence of trafficked women from other Caribbean islands and Venezuela in sex and domestic work on the south coast means that demand from the workforce can feed an existing illicit market. The controls are in the management plans rather than in this baseline: camp access control and curfew, worker movement, alcohol and off-site conduct rules, a prohibition on transactional sex and on engaging the services of sex workers, police background checks and a liaison protocol with the Oistins and Worthing stations and the Family Conflict Intervention Unit, worker transport that does not route through the Gap, and the confidential SH/SEA/GBV channel of the GRM (Code of Conduct, Section 8.4.8; SH/SEA/GBV Prevention and Response Plan, Section 8.4.9; Community Health Plan, Section 8.4.10).

6.8.13.1. Gender-Based Violence

According to UN Women, Gender-based violence is a violation of human rights. It is an offense against human dignity and a manifestation of the historically unequal power relations between women and men. Women's human rights are protected by a legal framework which includes international and regional human rights instruments, statutes and constitutions. Article 1 of the Universal Declaration of Human Rights declares that all human beings are born free and equal in dignity and rights. Caribbean constitutions recognize and guard the equal and inalienable rights of all persons within the country's

[97] Nation News. (2026). "Gun Journey." Nation News. Retrieved from https://nationnews.com

[98] Transparency International. (2024). Barbados – Country profile. Transparency International. Retrieved from https://www.transparency.org/en/countries/barbados

jurisdiction. Each person is secured with the right to life, liberty and security of the person and the right to protection of the law.

The Constitution holds the state accountable for violation of human rights. Each Caribbean State has a positive duty to take reasonable measures to protect women and girls from domestic violence and sexual violence. Barrow J in *Francois v Attorney-General of Saint Lucia* located this duty from the Bill of Rights of the Constitution. To adequately safeguard the human rights of women and girls, each Caribbean country must respect the rule of law. The rule of law requires that the State has proper regard for gender equality and provides just and effective remedies for victims of gender-based violence. States should provide a fair and accessible legal system for victims of gender-based violence. The rule of law operates so that all persons are equal before the law. International and regional human rights recognize women's human rights and mandate State parties to act with due diligence in protecting women and girls from domestic violence and sexual violence. At the international and regional levels, there are specific instruments that deal with domestic violence and sexual violence. Barbados is a signatory to six of the eight conventions that exist to guarantee the human rights of women[99].

The World Bank Women, Business and the Law series measure the legal and institutional environment for women's economic participation. The 2026 edition, drawing on data to 2024, assesses ten topics across three pillars: the law as written, the supportive frameworks that give it effect, and expert opinion on how it operates in practice. Barbados scores 65.0 for legal frameworks, 25.8 for supportive frameworks and 75.0 for expert opinion, against global averages of 67, 47 and 53 respectively (World Bank, 2026)[100].

The pattern matters more than the headline. Barbados sits close to the global average on the law as written but at roughly half the global average on the systems that deliver it, and that is the widest of its three gaps. The 2022 edition of the same series, scored on a different eight-category basis, recorded full marks for workplace, marriage, assets and pension, weaker results for mobility, pay, parenthood and entrepreneurship, and an overall 80 out of 100. The two editions are not directly comparable and the 2026 result supersedes the earlier figure. For this project the finding reads as a caution rather than a reassurance: compliance with the letter of Barbadian employment and anti-harassment law is not by itself evidence that those protections will operate in practice, and the controls set out in the Environmental and Social Management Plan carry the weight accordingly[101].

Despite challenges, women in Barbados have made significant strides in a number of areas. Women now outnumber men in tertiary education, and there is a growing awareness of the importance of gender equality in the country, and governmental leaders, through the Bureau of Gender affairs, are working to develop a National Plan of Action to address gender equality and the elimination of gender-based violence. [102]

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[99] Un Women. (n.d.). GBV and State Accountability. Accessed at https://caribbean.unwomen.org/en/caribbean-gender-portal/caribbean-gbv-law-portal/gbv-and-state-accountability (UN Women, n.d.)

[100] World Bank. (2022). Women, Business, and The Law: Barbados. Accessed at https://wbl.worldbank.org/content/dam/documents/wbl/2022/snapshots/Barbados.pdf (World Bank, 2022)

[101] UN Women. (n.d.) Barbados. Accessed at https://data.unwomen.org/country/barbados (UN Women, n.d.)

[102] The Borgen Project. (2023). Women's Rights in Barbados. Accessed at https://borgenproject.org/womens-rights-in-barbados/ (The Borgen Project, 2023)

6.8.14. Gender Baseline

Gender Equality is a human rights principle which asserts non-discrimination, implicit or explicit, against, or in favor of only one sex. Countries that are signatories to the United Nations are expected to uphold the principle of gender equality as enshrined in the Universal Declaration of Human Rights. Barbados was admitted to membership in the United Nations by resolution A/RES/2175(XXI) of December 9, 1966.

Upon accepting Barbados' membership to the UN Prime Minister Errol Barrow declared: Barbados accepts the obligations contained in the Charter of the United Nations and solemnly undertakes to fulfil them[103].

At the UN, Barbados has focused on major international issues and on areas of importance to its national economic development, to the establishment and maintenance of a just society, and to the development of an economic system that is equitably administered and enjoyed. Barbados' priorities at the UN include but are not limited to sustainable development; climate resilience; environment; renewable energy; disaster management; poverty eradication; promotion and protection of human rights; elimination of all forms of discrimination; Law of the Sea; oceans governance; financing for development; social development, education and health; equality and gender issues; multidimensional security and legal issues. Through Barbados' strong representation the Caribbean has been demonstrated strength in climate change mitigation strategy and development action planning.

At the 67th Meeting of the Committee on the Elimination of Discrimination Against Women, the delegation of Barbados to the Session was led by the Hon. Steven Blackett, then Minister of Social Care, Constituency Empowerment and Community Development. Barbados was commended for a number of legislative reforms undertaken in support of women's rights as well as the strengthening of related policy frameworks.

Issues of concern for the Committee during Barbados' review included weaknesses and gaps in Constitutional provisions against discrimination on the basis of sex, economic and labor disparities around women's high unemployment and the increasing gender pay gap[104] and challenges faced by Barbadian women in access to justice, and the potential risks posed by both new fiscal austerity measures and Barbados' status as an International Financial Centre, to reducing social protection for women, both nationally and internationally[105].

The government's response has been both comprehensive and multifaceted, national efforts have included a combination of legal and policy measures, social development programs, and community outreach initiatives; includes updates to the Employment (Prevention of Discrimination) Act. The Government, through the Bureau of Gender Affairs, aims to strengthen its response through additional initiatives, including a plan to develop a National Plan of Action. Some plans to align Barbados on this strategic direction are expected to commence this year, (Archer, 2026)[106] . The role of this national

[103] UN. (1966). Declaration of acceptance of the obligations contained in the Charter of the United Nations. Accessed at https://treaties.un.org/doc/Publication/UNTS/Volume 581/volume-581-I-8437-English.pdf (United Nations, 1966)

[104] OHCHR. (2017). CEDAW – 67 session. Accessed at https://tbinternet.ohchr.org/_layouts/15/TreatyBodyExternal/SessionDetails1.aspx?SessionID=1078&Lang=en (OHCHR, 2017)

[105] The Government of The Bahamas, Ministry of Foreign Affairs. (2017). 67th Session of the Committee on the Elimination of Discrimination Against Women. Accessed at https://mofa.gov.bs/67th-session-committee-elimination-discrimination-women (The Government of The Bahamas, Ministry of Foreign Affairs, 2017)

gender machinery is to ensure the integration of gender in all national development plans and policies, to achieve gender equity and equality.

Current policy instruments guiding the administration of gender equality include the National Strategic Plan of Barbados 2005 – 2025 (2005). Among its objectives, the Plan aims to incorporate gender and development into all areas of national development plans and policies so that women and men can benefit equally from existing opportunities[107]. These plans are supported by enabling legal instruments in the form of complementary legislation[108].

6.8.14.1. Political participation and Decision-Making

Today, women in Barbados enjoy legal protections against domestic violence and discrimination and have made significant gains in areas such as education and political representation. One major milestone in the history of women's rights in Barbados was the granting of suffrage to women in 1950. Since then, women have been able to participate in elections and hold political office, including the position of Prime Minister. Mia Mottley has held the position of Prime Minister in Barbados since 2018 to present and was the first woman to hold the title. However, women still face underrepresentation in political and economic leadership positions, and gender-based violence remains a persistent issue in the country.

Barbados also performs strongly on the composite measures. In the World Economic Forum Global Gender Gap Report 2025, Barbados ranks 15th of 148 economies with a score of 0.786, and scores 84.8 percent on the economic participation and opportunity subindex, having reached parity in the share of legislators, senior officials and managers. That standing sits uneasily beside the labor market and violence data set out below, and the two should be read together rather than in isolation: the composite indices measure the gap between women and men, not the absolute position of either.

[106] Ministry of Foreign Affairs and Foreign Trade. (2026). Barbados Remains Committed to Eradicating Violence Against Women & Girls. Accessed at https://www.foreign.gov.bb/barbados-remains-committed-to-eradicating-violence-against-women-girls/ (Ministry of Foreign Affairs and Foreign Trade, 2026)

[107] IDB. (n.d.). Legal Framework and Institutional mechanisms. Accessed at https://generoeninfraestructura.iadb.org/en/country/barbados (Inter-American Development Bank, n.d.)

[108] IDB. (n.d.). Legal Framework and Institutional mechanisms. Accessed at https://generoeninfraestructura.iadb.org/en/country/barbados (Inter-American Development Bank, n.d.)

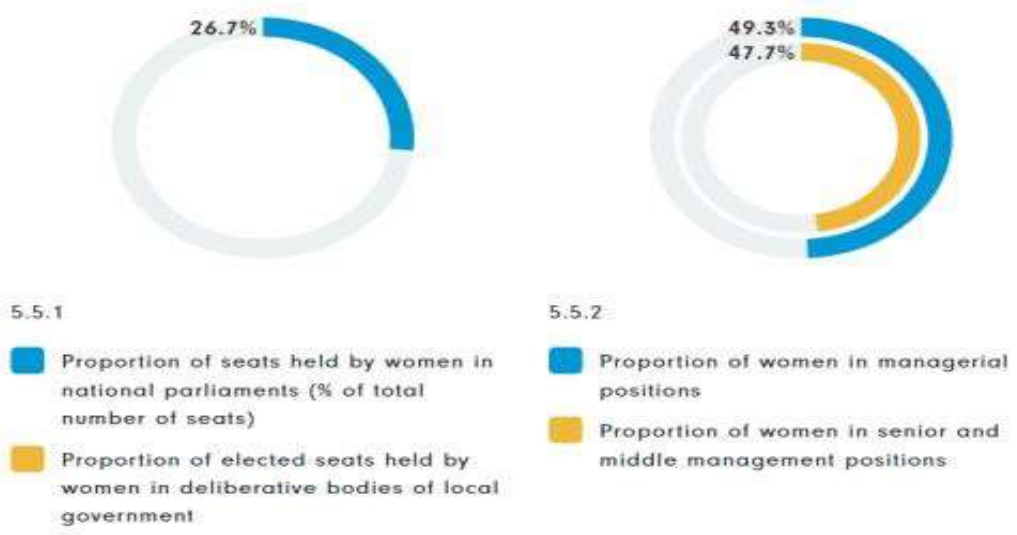


Figure 58**: Women's Participation in Barbados Society**

Women's participation across Barbadian society is shown at Figure 58.

6.8.14.2. Labor force Participation

According to the International Labor Organization report, Although Barbados compares favorably with other countries in the region on many gender equality measures, women continue to experience some labor market and employment challenges.

In 2023, women's labor force participation rate was 58.1%, compared to 67.0% among men. Women are also more likely to experience long-term unemployment, indicating that many women face persistent challenges in securing employment. Women are also disproportionately concentrated in sectors and occupations that are often characterized by low pay and poor working conditions, including in hospitality, retail, and the care economy. Women's disproportionate share of unpaid care work remains a principal barrier to increased participation in employment. Recent estimates suggest that Barbados could increase the female employment rate by around 10 percentage points over the next 10 years through targeted investment in care policies. Finally, constituents acknowledge that discrimination on the basis of sex and gender, including sex-based violence and harassment in the world of work, are additional factors contributing to gender-based labor market inequalities.

Women are generally overrepresented in education services, hospitality, and the care economy (including health, social work, and domestic work), while men predominate in sectors such as construction, manufacturing, and agriculture. These patterns of gender-based occupational segregation have implications for addressing prevalent labor market inequalities, with women disproportionately concentrated in several low-paying sectors (food and accommodation services, domestic work, social work, education, health) and underrepresented in some key emerging sectors with strong growth potential (such as energy, construction, and manufacturing). There are also notable patterns of vertical segregation, with one recent survey finding that almost three-quarters (73%) of private sector enterprises had a senior management team comprising only of men.

Gender-based segregation in Technical Vocational Education and Training (TVET) programs may limit women's access to high-growth sectors such as renewable energy and technology.

Figure 59 shows the labor force participation rate by sex.

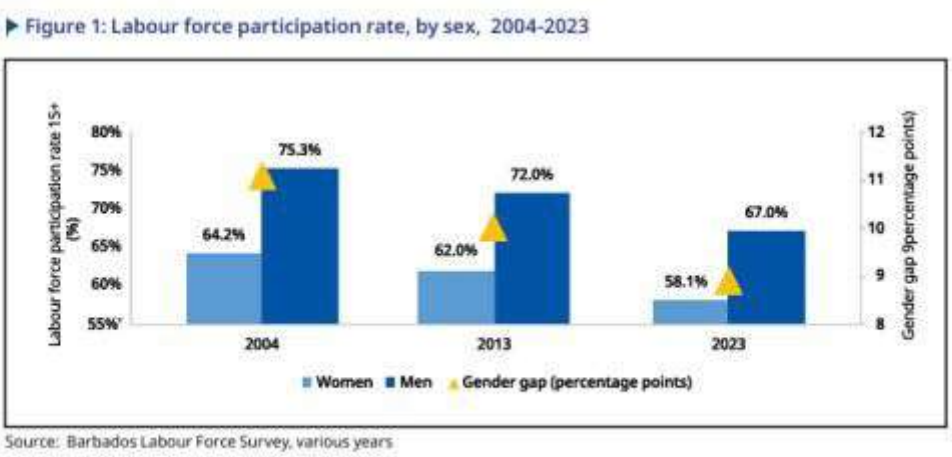


Figure 59**: Labor force participation rate by sex**

The labor force participation rate from 2004 to 2024 is shown at Figure 60.

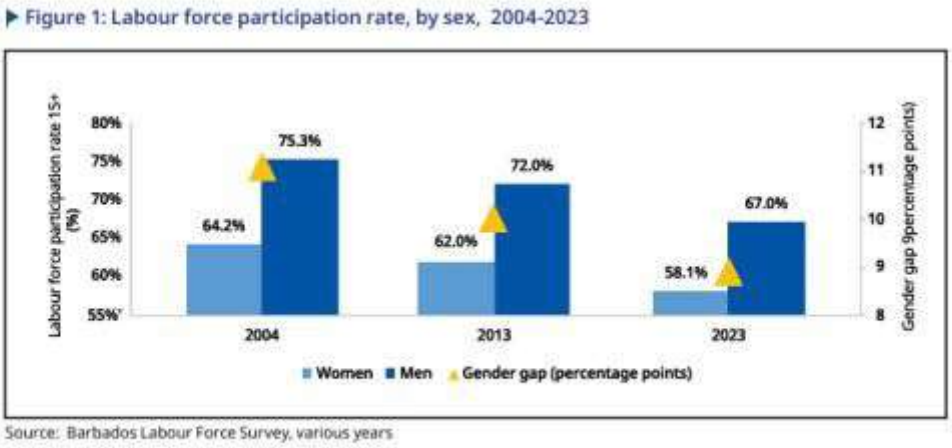


Figure 60**: Trend analysis of Labor Force Participation Rate 2004-2024**

6.8.14.3. Sexual and Gender-Based Violence

Caribbean scholars argue that remnants of colonialism in Barbados and the Commonwealth Caribbean are responsible for women and girls' high and escalating rates of violence, including physical and sexual violence[109]. Cultural norms in the plantocratic, patriarchal culture are reasoned to be an enabler of sexual and gender-based violence against women and girls in Barbados. Sexual and Gender-Based Violence scholars opine that the state is a purveyor of violence against women as well[110]. Many of the historical, resource, and cultural issues in Barbados are replicated to varying degrees across the

[109] Halimah A. F. DeShong, "Gendered Violence and Gender as a Site of Violence: Reflections from the Caribbean. (DeShong, n.d.)
[110] Ibid

Commonwealth Caribbean, where healthcare responses are perpetuating harm among some of the most vulnerable women and girls.

Despite Barbados being a signatory to a range of global health initiatives, including the most recent, PAHO/WHO Multi-Country Cooperation Strategy (MCCS) 2026–2031 in 2025, to improve healthcare responses to gender-based violence, women and girls cannot depend on healthcare services that support them[111]. Unlike other Caribbean neighbors like Trinidad and Tobago, Barbados does not have a formalized national plan to inform prevention and intervention measures. An example of the complex role of violence in Barbadian society is the investment of Barbadian heterosexual men in upholding rigid, traditional gender norms due to the power and privilege they provide – power not easily available in aspects of the society such as the economic sphere.

According to historian Beckles1995, as cited in Myrie & Lord (2024), plantation societies are built on both racial and gendered oppression. While the Commonwealth Caribbean independence projects sought to dismantle the racial oppression within the class hierarchy of plantation society, the gendered oppression was maintained for its value to men, the group disproportionately responsible for crafting the national agendas in the independence movement. There is a reproduction of harmful colonial relics, including traditional gender norms, ableism, and a hierarchy of race/class relations in Barbados and the broader Commonwealth Caribbean (Myrie & Lorde, 2024).

Population-based studies demonstrate the rates of violence against women in Barbados and the Commonwealth Caribbean are similar to the trends of gender-based violence across the world https://www.tandfonline.com/doi/full/10.1080/14461242.2024.2365250https://www.tandfonline.com/doi/full/10.1080/14461242.2024.2365250https://www.tandfonline.com/doi/full/10.1080/14461242.2024.2365250 (Bott et al., 2012, 2019; Le Franc et al., 2008, as cited in Myrie & Lorde, 2024). According to a landmark national survey that campaigners say exposes the hidden scale of gender-based abuse and the urgent need for coordinated national action.

The National Intimate Partner Violence survey revealed that 62% of women have experienced at least one form of intimate partner violence, a figure officials and advocates on gender-based violence said is likely an underestimation, given how many survivors still hesitate to disclose abuse.

The survey, funded by the European Union, commissioned by Jabez House and led by DB Research Services, interviewed 515 individuals of different ages, genders, income levels, and nationalities.

Emotional abuse emerged as the most prevalent form at 37%, followed closely by social isolation and physical violence at 25% and 22%, respectively. One of the most significant findings, however, showed that 46% of respondents reported facing more than one category of abuse, suggesting that "violence often occurs as a pattern of behaviors rather than in isolation." (Barbados Today, 2025)

In 2025, Barbados began working toward developing a Roadmap for a National Domestic Violence Action Plan, which will strengthen its domestic violence response framework. To this end, a National Consultation on Domestic Violence was held in March 2025 to advance a coordinated, multi-sectoral response to domestic violence. Consultations brought together policymakers, law enforcement, civil society representatives, service providers, and international partners to assess the current landscape,

[111] PAHO. 2025. PAHO/WHO and Barbados and Eastern Caribbean Countries sign multi-country cooperation strategy 2026-2031 to advance health and resilience. Accessed at https://www.paho.org/en/news/29-9-2025-pahowho-and-barbados-and-eastern-caribbean-countries-sign-multi-country-cooperation (Pan American Health Organization, 2025)

address critical gaps, and chart a path forward to develop the actionable roadmap. The Roadmap for a National Domestic Violence Action Plan will be structured around legislation, policy, social norms, prevention, essential services, data, and collaboration (Austin, 2025)

The work has since moved to the regional level. In October 2025 the Government of Barbados convened the first regional symposium on domestic violence in more than a decade, supported by the Inter-American Development Bank and the Caribbean Development Bank and bringing together Attorneys General, ministers, heads of bureaus of gender affairs, judicial leaders and law enforcement from eighteen Caribbean countries, with UN Women and UNFPA. The Government, through the Bureau of Gender Affairs, is working with UN Women and the Institute for Gender and Development Studies toward a comprehensive national policy on gender and has signaled its intention to commission a national study on the prevalence of gender-based violence. No such national prevalence study had been published at the time of writing, which is why the Jabez House survey below remains the most substantial Barbadian evidence available.

Despite notable efforts by authorities, service providers, and academia to record and track the incidence of gender-based violence (GBV) in the Caribbean, the lack of comprehensive, systematic, nationally-owned data remains a serious bottleneck in responding to and preventing GBV, including its most prevalent form – that of violence against women (CARICOM, 2014)

*"As a community, we continue to proactively address persistent inequalities in political representation, the development of policies to decrease the burden of unpaid care, and the unique challenges faced by women in marginalized communities, including indigenous women, rural women and those living with disabilities. The intersectionality of gender and other forms of inequality must guide our actions, ensuring that no woman is left behind. Notwithstanding the challenges, our women continue to make us proud. We celebrate the indomitable spirit, sterling accomplishments and remarkable contributions of our women and girls as they enrich our communities both in the Region and in the diaspora" (*Dr *Carla Barnett – Caricom Secretary- General, 2025)* (CARICOM Secretariat, 2025)**.**

From framework to project obligation. The legal and policy picture above sets four constraints on the Project, each with a project-level response. First, enforcement is weak: the supportive frameworks that give Barbadian GBV and employment law effect score well below the global average, so the Project does not rely on national systems as the first line of protection and instead provides its own confidential reporting, survivor-centered response and referral under the SH/SEA/GBV Prevention and Response Plan (8.4.9) and the GRM (8.4.12). Second, there is no national GBV prevalence study or domestic violence action plan, so the Project collects its own sex-disaggregated grievance, referral and awareness data (Table 192). Third, protection against discrimination in employment does not extend to gender identity, so the Code of Conduct's non-discrimination clause covers sexual orientation and gender identity explicitly (8.4.8). Fourth, women's under-representation in construction trades is a structural pattern that equal-opportunity law alone does not change, so the Labor Management Plan sets recruitment outreach, entry-level training and monitoring of women's share of positions by skill level (8.4.7.4; Table 112).

6.8.14.4. Women and men in the Direct Area of Influence

The preceding subsections describe the national position of women and men. This subsection describes who lives within the 1 km catchment, from the 2021 Census enumeration-area tabulations for Graeme Hall, St. Lawrence, Worthing and Rendezvous (Tables 39 to 41 and 44 to 46) and the household field

exercise of April 2026 (Section 7.7.1). Of 1,680 residents, 894 (53.2 percent) are women; women outnumber men in every age band above 25 and are 59.4 percent of residents aged 65 and over. Of 667 household heads, 347 (52.0 percent) are women, 161 of them aged 65 and over. Among the 685 residents with an occupation, 351 are women, concentrated in professional, clerical and service work; men hold 84 of 90 craft posts. Female heads own their homes at the same rate as male heads (61 percent) and rent privately slightly less (25 against 29 percent); female renters are concentrated at ages 25 to 49. Unemployment among the economically active is 13.0 percent, in line with 12.5 percent for Christ Church, where women are 53 percent of those looking for work (Barbados Statistical Service, 2023). The census activity tabulation is not disaggregated by sex at enumeration-area level, and neither disability, country of birth nor formality of work is tabulated by sex at this level; the parish disability prevalence of 4.1 per 100 persons (Pacific Disaster Center, 2024) implies some 70 residents of the catchment with a disability, most of them, given the age structure, older women. Those four gaps, and current rental values, are recorded in Section 5.7 and are to be closed from Statistics Barbados and the Community Health Assessment profile before construction begins.

The household survey of April 2026 reached 79 households: 44 headed by men, 31 by women and 4 undisclosed; 14 female-headed, 12 older persons living alone, 9 tenants and 3 migrant households. The in-person town hall of 23 September 2026 recorded 30 men, 26 women and 3 unrecorded among 59 attendees; the virtual session of 8 October logged 34 participants without recording sex. Sex-disaggregated attendance is recorded for every future engagement event and reported in the quarterly social monitoring report.

What the profile means for the Project is that the daytime population most exposed to construction nuisance is old and predominantly female; that the households least able to absorb rent, transport or food price shocks are headed by older women on fixed incomes and by working-age women renting privately; and that the employment benefit of construction will accrue to men unless recruitment and training reach women deliberately, because the trades in demand are ones in which local women are absent.

6.8.14.5. Vulnerable groups with gender dimensions

The vulnerable groups identified across this assessment are consolidated here with the local evidence for their presence and the instrument through which the Project responds. Female-headed households: 347 of 667 (Table 45), most without a partner present, 238 headed by women aged 55 and over; exposed to nuisance and cost-of-living pressure; addressed through rental and price monitoring and targeted GRM outreach in the Social Management Plan and through meeting times and venues set for caregivers in the Stakeholder Engagement Plan. Older women, including those living alone: 257 women aged 65 and over, 164 heading households; exposed to dust, odor, noise and heat and dependent on walking, public transport and a hospital 7 km away; addressed through receptor monitoring and nuisance controls in the Noise, Air Quality and Community Health Plans and in-person and telephone GRM channels. Working-age women renting privately: 44 female heads aged 25 to 49 (Table 46); exposed to rent pressure from the non-local workforce; addressed through the rental baseline and tenant communication in the Social Management Plan. Women and girls in informal work, including vending and sex work: observed along the community road and in St. Lawrence Gap, not enumerated; exposed to loss of footfall and to harassment, exploitation and transactional sex from a male non-local workforce; addressed through the vendor relocation protocol, the worker conduct rules of the Code of Conduct and discreet outreach through community organizations. Women with disabilities and residents with mobility limits: 32 adults

recorded as incapacitated, disability by sex not tabulated; exposed to temporary routes, closures and print-only information; addressed through accessible routes, advance notice and accessible GRM formats. Adolescent girls: St Lawrence Primary School and St. Luke's Academy lie on the single camp access route, with 386 residents under 25; exposed to worker presence at bus stops, shops and beaches; addressed through traffic windows avoiding school travel times, child protection provisions and school liaison. Migrant and non-national women: 3 of 79 households interviewed, country of birth not tabulated; exposed to exploitation and deterred from reporting by insecure status and language; addressed through GRM access without proof of status, multilingual information and migrant worker protections in subcontracts. Women in the Project workforce: 21 women among 252 planned positions, all through subcontractors; exposed to harassment, inadequate facilities and ill-fitting PPE on a male-dominated site; addressed through the gender-specific OHS measures of the Labor Management Plan, separate sanitary facilities as binding minima and subcontract flow-down of the Code of Conduct and the SH/SEA/GBV Plan. LGBTIQ+ persons: no local data; exposed to discrimination and harassment and reluctant to report; addressed through the non-discrimination provisions of the Code of Conduct and the confidential GRM channel.

6.8.14.6. Project-specific gender risk statements

The baseline translates into three gender risk statements, which are carried into the Gender and Social Assessment (Section 7.6) and the Environmental and Social Management Plan.

Risk to women and girls in the host community. Because the Project brings up to 120 non-local, almost entirely male resident workers and up to 203 people a day into a catchment where women are 53 percent of residents, 52 percent of household heads and 59 percent of those aged 65 and over, within walking distance of St. Lawrence Gap, there is a risk that women and girls are exposed to sexual exploitation, harassment and transactional sex at the camp interface, on the community road and at bus stops, shops, beaches and the Gap; and that older women at home during the day and working-age women renting privately bear most of the construction nuisance and any rise in rents and prices. Managed through the Code of Conduct (8.4.8), the SH/SEA/GBV Prevention and Response Plan (8.4.9), the Community Health Plan (8.4.10), the Traffic and Pedestrian Management Plan (8.4.6) and the rental baseline of the Social Management Plan (8.4.15); monitored through the SEA/SH/GBV, GRM awareness and host community indicators in Table 192.

Risk to women working on the Project. Because the 21 women in a workforce of 252 are all, except one, employed through local subcontractors on a site where every construction trade is held by men, there is a risk of sexual harassment and discrimination, inadequate or shared sanitary facilities, ill-fitting PPE, and weaker recourse because the employer is a subcontractor rather than the Contractor. Managed through the Labor Management Plan (8.4.7), the gender provisions of the HSE Management Plan (8.4.13.22), separate sanitary and washing facilities as binding minima, subcontract flow-down of the Code of Conduct and the SH/SEA/GBV Plan, and the worker GRM; monitored through workforce, training and grievance indicators by sex (Table 192).

Risk of women's exclusion from Project benefits. Because women hold none of the 154 posts in construction trades, plant operation and haulage, and 21 of 252 posts overall, against a local occupational profile in which women hold most professional, clerical and service jobs (Table 44), there is a risk that the employment and skills benefits of the Project accrue almost entirely to men; and because women's time is constrained by care work and information often reaches households through male heads, there is a risk that women's concerns are under-recorded in consultation. Managed through

the recruitment, training and target provisions of the Labor Management Plan (8.4.7.4) and the gender commitments in Table 112, and through the engagement arrangements in 6.8.14 and 7.6.9; monitored through women's share of positions by skill level, training places by sex and participation by sex (Table 192).

6.8.14.7. Gender baseline indicators

The analysis above is largely qualitative. The indicators that carry it into Environmental and Social Management Plan monitoring, with their baseline values at the date of this assessment, are: the share of Project positions held by women, by skill level, direct or subcontracted and local or non-local (baseline 21 of 252 positions, 8.3 percent, all subcontracted and local, none directly employed by the Contractor; source HR and subcontractor returns, monthly); the number and share of women in supervisory and technical roles (baseline from the Labor Management Plan role table, Table 108; quarterly); women completing Project-funded training or apprenticeships (baseline 0; quarterly); the share of women among participants at consultations and engagement events, with age and disability disaggregation (baseline 44.1 percent at the in-person town hall of 23 September 2026 and 39 percent in the household survey; every event, reported quarterly); the number of engagement events at which women's safety or gender-based violence concerns were raised and the number with a documented response (baseline 0; quarterly); the number of SEA/SH/GBV grievances received, by channel and origin, and the share handled within protocol, including referral offered within 24 hours (baseline 0; monthly, from the confidential register); the number of referrals made to the services in Table 111 and accepted (baseline 0; monthly); workers and supervisors completing SEA/SH/GBV induction and annual refresher training, by sex and nationality (baseline 0; monthly during mobilization, then quarterly); the share of women and men in the catchment who know of the GRM and its confidential channel and consider it safe to use (baseline survey before camp occupation, then annually); and the number of female-headed and renter households and the median rent for one- and two-bedroom units (baseline 347 and 26.9 percent private rental, rents to be established; semi-annually). The Contractor's Social Personnel collect and analyze these indicators and report them to the Project Execution Unit; the indicators are carried in the Gender Monitoring Matrix (Table 192) and the gender commitments (Table 112) so that baseline, commitment and monitoring use the same measures. National data gaps on informality, disability and migration are acknowledged, and the Project's workforce, grievance and engagement data will be used to fill them for the catchment.

6.8.14.8. Gender-responsive stakeholder engagement and grievance redress

The Stakeholder Engagement Plan (Section 8.4.11) and the Grievance Redress Mechanism (Section 8.4.12) set out the full arrangements. Their gender-specific features follow directly from this baseline: a population that is older and more female than the national average, half of households headed by women, women concentrated in care, service and informal work with little control over their daytime hours, and a documented reluctance among women to use public complaint routes. Meetings are therefore scheduled and sited so that women and girls can attend safely: within the community, on bus routes, in daylight or early evening, avoiding school pick-up and peak care hours, with a children's space where feasible and never in licensed premises. The Project aims for at least 40 percent women among participants where feasible and records participation by sex, age and disability at every event. Facilitators and Community Liaison Officers are trained in gender-sensitive facilitation, and separate women's and men's discussions are held where the subject warrants it, in particular on safety, SEA/SH/GBV and worker conduct. The GRM offers multiple entry points (telephone, in person, written, anonymous drop box and email), at least one trained female focal point, and a confidential SEA/SH/GBV channel handled on survivor-centered principles in which the survivor decides whether an investigation

proceeds, no disclosure of identity or status is required, and referral to the services mapped in Section 6.8.11 and Table 111 is offered within 24 hours.

6.8.15. Legal Framework

Gender equality in the Program is governed by three layers of obligation: Barbadian law, the international instruments to which Barbados is party, and ESPS 9 of the IDB Environmental and Social Performance Framework. The instruments, their key provisions, the performance standards they activate and the units responsible for demonstrating compliance are set out in the Legislative and Institutional Framework (Tables 18, 21 and 22) and are not repeated here. Table 48 summarizes what each layer means for the gender baseline.

Table** 48**: Summary of the gender-relevant legal framework

Layer	Principal instruments	Bearing on the Program
National: rights and non-discrimination	Constitution of Barbados (Chapter III); Employment (Prevention of Discrimination) Act, 2020; Employment Rights Act, 2012; Employment of Women (Maternity Leave) Act	Equality before the law; non-discrimination in hiring, pay, promotion and dismissal; maternity protection. These apply to the Contractor and its subcontractors.
National: violence and harassment	Sexual Offences Act; Employment Sexual Harassment (Prevention) Act, 2017; Domestic Violence legislation	Criminal framework for sexual offences; employer duty to adopt and post a written harassment policy with complaint procedure and penalties; protection orders. These underpin the SH/SEA/GBV Prevention and Response Plan and the Code of Conduct.
National: conditions of work	Minimum Wage Act and Order; Protection of Wages Act; Safety and Health at Work Act	Minimum wage, wage payment and workplace welfare duties, including the sanitary and washing facilities treated as binding minima in the camp design.
International	CEDAW (including General Recommendations 37 and 38); Belem do Para; ILO C190 and C111; Beijing Platform for Action	Standards on discrimination, violence and harassment. General Recommendation 38 bears on the management of a non-local workforce, and General Recommendation 37 on climate resilience.
IDB ESPS 9	Gender Equality	Prevent and mitigate gender-based risks, include all genders in benefits, prevent SGBV and respond promptly, and ensure safe and equitable participation in consultation.

Project application. The Contractor directly employs one woman, a Chinese national in project management, who is accommodated in the female dormitory (Dormitory-1) of the Management Staff Camp. All other female workers will be engaged through the proposed local subcontractors, and female

hiring will be promoted among them through the local content provisions of the Labor Management Plan. Local personnel are engaged across material supply, landscaping, road works, laboratory testing, geotechnical investigation, utility connection, customs brokerage and professional services, and these functions are contracted and not staffed directly by the Contractor. Subcontractors are bound by the Workers' Code of Conduct and by the non-discrimination requirements of the Employment (Prevention of Discrimination) Act, 2020. Workforce numbers are reported to the Project Execution Unit disaggregated by sex for directly employed and subcontracted personnel, and the gender monitoring matrix tracks the number of men and women hired and the roles of women in technical, non-technical and decision-making positions.

6.8.15.1. Gender sensitivity of the applicable legislation

The instruments listed above were reviewed a second time, against gender rather than against subject matter, to establish how far the legal framework governing this project addresses women, and whether it refers to vulnerable groups at all. Each instrument was placed on a five-point scale, from gender neutral, where the text is silent on gender, through gender aware, gender sensitive and gender responsive, to gender transformative, where the instrument sets out to change the structures that produce inequality. Twenty-nine instruments were classified. Table 49 sets out the result.

Table** 49**: Gender sensitivity of the legislation applicable to the Workers' Camp

Classification	What the classification means	Count	Instruments so classified
Gender neutral	Makes no mention of, or reference to, gender or women	20	Planning and Development Act 2019; Planning and Development (Environmental Impact Assessment) Regulations; Health Services Act 1969 (CAP 44) and Health Services (Amendment) Act 2025; Health Services (Food Hygiene) Regulations 1969; Health Services (Rodent Control) Regulations 1969; Health Services (Nuisance) Regulations 1969; Health Services (Collection and Disposal of Refuse) Regulations; Marine Pollution Control Act 2000 (CAP 392A); Storm Water Management Act 2025; Barbados Water Authority Act 1980 (CAP 274A) and amendments; Barbados Water Authority (Sewage) Regulations 1982; Safety and Health at Work (Drinking Water) Regulations 2022; Safety and Health at Work (Noise) Regulations 2022; Safety and Health at Work (Personal Protective Equipment) Regulations; Safety and Health at Work (Workstation) Regulations 2022; Safety and Health at Work (General Duties) Regulations; Accidents and Occupational Diseases (Notifications) Act 1952 (CAP 338); Protection of Wages Act 1951 (CAP 351); Recruiting of Workers Act 1938 (CAP 354); Road Traffic Act 1981 (CAP 295) and Amendment Act 2022
Gender aware	Gender-specific norms, roles and issues are addressed	2	Health Services (Building Regulations) 1969; Employment Sexual Harassment (Prevention) Act 2017 and amendments
Gender sensitive	Sets out steps to ensure gender inequalities are not worsened as a	5	Health Services (Lodging Houses and Barracks) Regulations 1970; Safety and Health at Work Act 2005 (CAP 356) and amendments; Safety and Health at Work (Sanitary Conveniences) Regulations; Safety and Health at Work

Classification	What the classification means	Count	Instruments so classified
	result of the instrument		(Washing Facilities) Regulations; Employment Rights Act 2012 (Act 2012-9)
Gender responsive	Acknowledges differences and inequalities between women and men and sets out action to address them	2	Sexual Offences Act and Amendment Act 2024; Employment (Prevention of Discrimination) Act 2020
Gender transformative	Seeks to resolve structural inequality and to challenge social and cultural norms	0	None of the instruments reviewed

Two findings follow. The first is that twenty of the twenty-nine instruments, being sixty-nine percent of the framework, are silent on gender. That silence is concentrated in exactly the instruments that govern the physical works: planning and environmental impact assessment, water supply and sewerage, storm water, marine pollution, refuse, noise, personal protective equipment and road traffic. The consequence is that gender considerations enter the design and operation of the camp through this assessment and through the Environmental and Social Management Plan, not through the permitting regime, and will not be picked up by regulatory compliance alone.

The second is that none of the instruments is gender transformative, and only two are gender responsive: the Sexual Offences Act and the Employment (Prevention of Discrimination) Act. Barbadian law engages with gender where violence and discrimination are the express subject and is largely silent elsewhere. The five gender sensitive instruments are, with one exception, the occupational health and welfare regulations that require separate sanitary and washing facilities, which is why those provisions carry disproportionate weight in the camp design and are treated as binding minima in the Workers' Health and Safety Plan rather than as good practice.

This classification is the analytical contribution of the gender baseline prepared for the project. It does not alter the legal obligations set out earlier in this chapter; it establishes where those obligations will and will not do the work of protecting women, and therefore where the project has to act on its own account.

The Project's response is accordingly to go beyond minimum legal compliance in four respects: targeted measures to increase women's access to skilled and semi-skilled Project employment through recruitment outreach, entry-level training and apprenticeships (Labor Management Plan, Section 8.4.7.4; Table 112); camp design and management for the safety of women workers and neighbors, with separate, lockable and well-lit sanitary and washing facilities as binding minima, lighting of access routes and the perimeter, and rules on worker movement, alcohol and off-site conduct (Code of Conduct, 8.4.8; Community Health Plan, 8.4.10); zero tolerance of discrimination, sexual harassment, sexual exploitation and abuse and gender-based violence, with graduated sanctions and survivor-centered response (SH/SEA/GBV Prevention and Response Plan, 8.4.9); and written protocols with the

Bureau of Gender Affairs, the Family Conflict Intervention Unit and GBV-specialist organizations on prevention, training and referral, agreed before camp occupation. These commitments are tracked through the Gender Monitoring Matrix (Table 192).

6.9. Baseline Summary

This section sets the baseline against which Program effects are assessed. The SCSTP upgrade, the SCWRRF and the Workers' Camp occupy adjacent footprints on one parcel, so a single baseline of receptors, physical setting and socio-economic context serves all three. Two caveats apply to every finding. All field data fall within the dry season, so wet-season conditions, which govern runoff, standing water and bypass activation, rest on physical characterization and professional judgment. The receiving environment is also already under stress from urban drainage, illegal dumping, Hurricane Beryl damage and an altered hydrological regime, so Project effects are increments on a system with limited remaining capacity.

Physical setting and climate

- The site is low-lying, flat southern Christ Church (parish average elevation 46 m), near coral reefs, wetlands, recharge zones and erosion-prone shorelines.
- Soils are heavy and clay-rich, and Vertisols are shrink-swell. This requires specific foundation design, stormwater management against ponding, and careful excavation and stockpiling over thin topsoil. Site sampling rated pH Excellent, organic matter Good, nitrogen High, phosphorus Very High and potassium Moderate to High.
- Karst limestone gives rapid recharge and little natural attenuation, so contaminants reach groundwater quickly. This is why chemical and fuel storage and reclaimed water quality are priority controls.
- The site is in Zone 5 (Non-Recharge Contributing) under the 1963 groundwater zoning. The 2020 policy proposes Zones A to E, addresses persistent chemicals and nitrate, and protects coastal waters. The designation is unconfirmed and governs the conditions of the recharge component.
- Barbados is among the most water-scarce countries in the world, so each cubic meter of reclaimed water is a cubic meter of potable supply not drawn down.
- The main climate hazards are hurricane wind, extreme heat, rainfall flooding, drought, grassfire, Saharan dust and earthquake. The BMS forecasts daytime peaks of 32 to 34 °C through October 2026 with El Niño conditions, which bears on heat stress, work scheduling and dormitory cooling.
- Flooding is more likely to sever access than to damage buildings. The camp's only access is an earthen dam of about 730 m. Loss of grid or overhead lines is as important as structural damage, so generator and water storage must be sized for that scenario.

Hydrology and water quality

- Site drainage follows the eastern gully to the Eastern Marsh and the wetland (about 33 ha, in a watershed of about 1,158 acres).

- The sea connection is altered. The sluice gate was apparently inoperable in August 2026, so the system is predominantly freshwater with reduced flushing, and four urban drainage connections already discharge into it.
- Historical data from 2010 and 2018 are indicative only. They show eutrophic conditions, with chlorophyll-a rising from 33 to 84 µg/L and fecal coliform at 9,500 cols/100 ml in 2018.
- April 2026 sampling shows the existing plant is not treating effluent. For several parameters the effluent is worse than the influent.
- Samples were single grabs at five locations, so they show order of magnitude and gross exceedance, not statistical trends. No groundwater baseline exists.
- The SCWRRF takes its influent from the SCSTP, so its reclaimed water targets depend on the upgrade delivering the design standard.

Air and noise

- Air quality was sampled at three locations in April 2026. Results vary widely (PM10 was 59.61 µg/m^3 at Location 1 and 1.83 to 4.86 µg/m^3 at the upwind locations). Saharan dust compounds the particulate baseline. Greenhouse gases were not sampled.
- Noise was monitored at eight locations on 15 to 17 April 2026. The Harmony Hall homes (Location 3) already record 56.3 to 60.5 dB(A), at or above the 55 dB(A) WHO guideline. The existing plant is itself a noise source (63.8 dB(A) at the pumps).
- Monitoring covered working hours only, so there is no night-time baseline against the 45 dB(A) reference, and site generators run continuously.

Biological environment

- Graeme Hall Swamp is Barbados' only Ramsar site, an Important Bird Area, and holds the largest remaining red and white mangrove stands. Williams (2008) valued it at about US$551 million.
- The Critical Habitat Assessment confirms the swamp as Critical Habitat and Critical Natural Habitat. Criteria A, B and F are confirmed triggers, and Criteria C, D and E are retained as potential triggers.
- Its condition is poor. The benthic community has 17 taxa, against about 300 in a healthy Florida mangrove. Fish diversity has declined sharply, and tarpon was the only fish species observed in the lake in 2019. The drivers are stormwater inputs, loss of tidal exchange and raw sewage discharges. August 2026 field verification rated the accessible wetland Moderate to Good, with localized hurricane, dumping and infrastructure degradation.
- The swamp's pollutant and sediment retention and its habitat and refuge functions are priority ecosystem services. Its downstream link to the St Lawrence lagoon seagrass and reef (live coral about 12%) is a water-quality pathway to marine receptors, including the Endangered green turtle.
- The camp footprint (about 6,592 m^2) is dry scrub grassland, mostly black spear grass, with no water body and no bird habitat. No critical habitat was observed within the footprint itself. This is separate from the swamp's confirmed status.

- Two protected trees were recorded nearby: Roughbark lignum-vitae (Endangered) and West Indian mahogany (Near Threatened, CITES Appendix II). The African green monkey is listed under CITES Appendix II.
- Station FV-05 (the Nature Sanctuary) could not be accessed in August 2026. Its evidence comes from 10 April 2026 observations and is kept distinct from the August findings.

Social baseline

- Residents are much older than the national profile. People aged 65 and over are 25.8% of residents against 13.57% nationally, and those aged 55 and over are 41.1% against 27.48%. Retired, home-duties and incapacitated residents (473 people) are present during the working day. This raises sensitivity to odor, dust and noise.
- Of 667 households in the wider area, 60% are owner-occupied and 27% privately rented. Renters are exposed to labor-influx pressure on housing.
- The April 2026 field exercise identified 50 households in the Harmony Hall DAI on a convenience basis. The census profile fills the household and demographic gaps.
- The nearest residential receptor is about 250 m away and is rated high sensitivity. Local clinics have no 24-hour emergency service, so serious cases go to the Queen Elizabeth Hospital, about 7 km away.
- The labor market is tight, with an aging workforce and heavy reliance on migrant labor in construction, services and agriculture.
- On gender, 62% of women surveyed reported intimate partner violence, and no national prevalence study exists. Barbados scores 25.8 against a global average of 47 on the supportive frameworks that put women's legal protections into practice. Of 29 applicable legal instruments, 20 are gender neutral, 2 are gender responsive and none is gender transformative. Gender protections therefore depend on the ESMP, not on permitting.

6.10. Conclusion

The baseline supports the following conclusions, which are carried into the Impact Assessment and the Management Plans.

1. **One shared baseline is appropriate.** The SCSTP upgrade, the SCWRRF and the Workers' Camp share receptors, physical setting and socio-economic context. The Environmental and Social Management Plans can therefore apply consistently across the site, with facility-specific measures added only where a distinct pathway arises, such as odor or reclaimed water reuse. This captures cumulative effects without duplication.
2. **Effects are increments on a stressed system.** The wetland has lost tidal flushing, receives urban runoff and carries storm damage and dumping. Its benthic and fish communities are degraded. Ambient noise at the nearest homes already meets or exceeds guideline values. Construction effects are judged against these conditions and not against an undisturbed system.

3. **The receptor is confirmed Critical Habitat.** Graeme Hall Swamp is confirmed as Critical Habitat and Critical Natural Habitat, and the existing plant's emergency bypass discharges toward it. This sets the highest sensitivity in the assessment and is why discharge and bypass pathways rate Critical or Very High before mitigation.
4. **The upgrade is the corrective measure, and the SCWRRF depends on it.** The existing plant is a continuing pollution source, and its effluent is worse than its influent for several parameters. The upgrade removes that source, and its benefit is measured against the quantified starting point. The SCWRRF's influent quality, and so its reclaimed water targets, are achievable only if the upgrade delivers. Foul discharge from the camp also feeds this plant during construction.
5. **Sensitive receptors set the priority controls.** The karst aquifer, the Ramsar wetland and its downstream marine habitats, and the older residents about 250 m away justify these priorities:
    - chemical and fuel storage
    - sediment and runoff control on the eastern gully
    - dust and noise limits
    - camp sanitation
    - the Emergency Response Plan for access severance, utility loss and heat
    - the gender and labor-influx controls in the ESMP

7. Environmental and Social Impact Assessment

7.1. SCSTP Environmental and Social Impact Assessment

This section applies the Program assessment methodology to the plant upgrade. It identifies the impact pathways specific to this component, assesses each against the likelihood and magnitude scales, and records the significant conversion or degradation determination where a Key Biodiversity Feature is engaged.

Social pathways PRJ-SI-01, PRJ-SI-02 and PRJ-SI-03 are assessed once at Project level because the workforce, the accommodation arrangements and the governing social instruments are common to both facilities and the workers' camp.

7.1.1. Introduction to the Assessment

Three features distinguish this component from the reclamation facility and shape the assessment that follows. The works are carried out on and around a plant that must continue treating sewage throughout, so the interface between construction activity and live operations is itself an impact pathway rather than a construction constraint. The plant has a documented discharge history and an emergency bypass that discharges into confirmed Critical Habitat, so the pathways of greatest consequence are those associated with discharge rather than with the construction footprint. The plant is currently performing so far below its design standard that the upgrade is assessed as a beneficial effect of high magnitude

measured against a quantified starting point, which is a different proposition from an incremental improvement.

Pathways are grouped as environmental impacts, prefixed EI, and social impacts, prefixed SI, and each is presented in a standard table recording the source activity, the potential impact, the risk, the nature and type of impact, extent, duration, likelihood and magnitude before mitigation, the resulting pre-mitigation significance, a summary of mitigation with a cross-reference to the management measures, likelihood and magnitude after mitigation, residual significance, and the management measures addressing residual impact. Where a pathway acts on a Key Biodiversity Feature, the table records the additional determination against the significant conversion or degradation test

7.1.2. Impact Pathways Identified

Table 50 presents the SCSTP impact pathways identified.

Table** 50**: SCSTP impact pathways identified

Ref	Pathway	Phase	Primary receptors
STP-EI-01	Discharge of untreated or partially treated sewage during bypass or construction	Construction and commissioning	KBF 1, KBF 2, KBF 5, coastal users
STP-EI-02	Emergency bypass activation reaching the Bisecting Canal and the Sanctuary lake	Construction and operation	KBF 1, KBF 2, KBF 3, KBF 5, KBF 6
STP-EI-03	Odor, hydrogen sulfide and bioaerosol release at community receptors	Construction and operation	Residents, schools, workers
STP-EI-04	Sludge and screenings handling, storage and disposal	Construction and operation	Community, disposal site, groundwater
STP-EI-05	Effluent quality change at the receiving environment following the upgrade	Operation	Coastal waters, KBF 5, beach users
STP-EI-06	Air quality and dust at community receptors	Construction	Residents, schools
STP-EI-07	Noise and vibration at community receptors	Construction	Residents, schools
STP-EI-08	Traffic and road safety on the shared access route	Construction	Road users, schoolchildren, vendors
STP-EI-09	Waste, spoil, demolition material and hazardous material management	Construction	Wetland, groundwater, community
STP-EI-10	Vector breeding associated with standing water and works areas	Construction	Community, wetland
STP-EI-11	Alteration or decommissioning of the existing wetland conveyance	Construction	KBF 1, KBF 2, KBF 5
STP-EI-12	Chance find of cultural heritage during excavation	Construction	Cultural heritage
STP-EI-13	Energy demand and greenhouse gas	Construction and	Global, and the Contract

Ref	Pathway	Phase	Primary receptors
	emissions	operation	non-carbon commitment
STP-EI-14	Interface between construction activity and live plant operations	Construction	Plant personnel, community
STP-EI-15	Accidental or emergency release of chemicals, fuel or process water	Construction and operation	KBF 1, KBF 2, KBF 3, KBF 5, KBF 6
PRJ-SI-01	Employment, local hiring and procurement	Construction and operation	Local workforce, businesses
PRJ-SI-02	Labor influx and worker community interaction	Construction	Community, workers
PRJ-SI-03	Sexual exploitation and abuse, sexual harassment and gender-based violence	Construction	Women and girls, students, migrant women, PwD
STP-SI-04	Community health and safety	Construction and operation	Residents, schoolchildren, vulnerable groups
STP-SI-05	Livelihood and amenity effects, including coastal amenity	Construction	Vendors, fishers, owner occupiers, visitor economy
STP-SI-06	Public acceptance, perception and trust	All phases	Community, stakeholders

Impact Assessment: Discharge and Operational Continuity

This group contains the pathways of greatest consequence at this facility. All four (which are STP-EI-01, STP-EI-02, STP-EI-05 and STP-EI-11 as seen in Table 51) turn on the same physical fact: the plant discharges into a hydrological system that connects directly to confirmed Critical Habitat, and that system has reduced capacity to dilute or export what enters it because the connection to the sea has been altered and the sluice gate was recorded as apparently inoperable in August 2026. Operation of the sluice gate remains the responsibility of the Drainage Unit of the Ministry of Transport and Works (MTW). STP-EI-01 and STP-EI-02 address discharge during the works and on emergency activation; STP-EI-05 addresses the beneficial change in effluent quality that the upgrade is intended to deliver; and STP-EI-11 addresses the future of the existing conveyance, which lies within Critical Habitat and whose configuration is unsettled.

7.1.2.1. STP-EI-01 Discharge During Bypass or Construction

Table 51 sets out the assessment of this pathway.

Table** 51**: STP-EI-01 Discharge during bypass or construction: impact assessment

Field	Assessment
Activity	Taking process units out of service; temporary works and bypass operation; tie-ins; commissioning and testing
Potential impact	Discharge of untreated or partially treated sewage to the receiving environment for the duration of each bypass

Field	Assessment
Risk	Deterioration in receiving water quality, pathogen loading, nutrient enrichment, and exposure of coastal and wetland users
Nature and type	Adverse, direct, construction and commissioning
Extent	Local, extending to regional through coastal waters
Duration	Temporary for each event, with the aggregate duration determined by the construction sequence
Likelihood	5, almost certain. Bypass is a planned activity within the construction sequence, so the assessment turns on duration, discharge quality and containment
Magnitude	4 to 5, high to catastrophic depending on volume, duration and receiving water
Pre-mitigation significance	Critical
Mitigation summary	Operational Continuity and Bypass Management Plan minimizing bypass duration and frequency through construction sequencing; treatment maintained to the highest practicable standard during bypass; temporary storage where available; scheduling to avoid periods of elevated inflow; discharge monitoring during each bypass; notification protocol; halt to construction in favor of restoring treatment where monitoring exceeds the defined trigger (see SCSTP Priority Measures below)
Post-mitigation likelihood	4, likely. Bypass remains a planned activity and its occurrence is not eliminated by mitigation
Post-mitigation magnitude	3, moderate. Duration and discharge quality are controlled, and the receiving environment remains of high sensitivity
Residual significance	High
Significant conversion or degradation	Assessed under the SCSTP Significant Conversion or Degradation Assessment. A severe or prolonged uncontrolled release is a credible significant degradation scenario
Residual management	Discharge quality monitoring at each stage; receiving water monitoring in the Bisecting Canal, Eastern Marsh and at the coastal outlet; event register recording date, duration, volume and quality; notification within four hours

7.1.2.2. STP-EI-02 Emergency Bypass Activation

Table 52 sets out the assessment of this pathway.

Table** 52**: STP-EI-02 Emergency bypass activation: impact assessment

Field	Assessment
Activity	Plant failure, power loss, pump failure, elevated inflow, or construction related interruption

Field	Assessment
	causing activation of the 2003 emergency bypass
Potential impact	Discharge of raw sewage into the Graeme Hall Bisecting Canal, and where the sluice gate is closed, onward into the Sanctuary main lake
Risk	Contamination of confirmed Critical Habitat with organic waste, nutrients, pathogens, chemicals, oil and grease; elevated nitrogen, ammonia, phosphorus, orthophosphate, bacteria, algae and suspended solids
Nature and type	Adverse, direct, construction and operation
Extent	Local, extending through the wetland system to the coastal connection
Duration	Temporary for a contained event, long-term for a substantial release
Likelihood	3, possible. Construction on an operating plant raises the likelihood of an emergency event during the Project period
Magnitude	5, catastrophic. The receiving water is confirmed Critical Habitat, the sluice gate was recorded as apparently inoperable in August 2026, no formal spill protocol is confirmed, and the 2005 event released between three and six million gallons reaching the main lake
Pre-mitigation significance	Very High
Mitigation summary	Confirmation of the bypass status with the Barbados Water Authority and of the sluice gate status with the Drainage Unit of the Ministry of Transport and Works (MTW) before construction adjacent to the operating plant; establishment of a Sewage Spill Response Protocol explicitly recognizing Graeme Hall as Critical Habitat; engineering confirmation of emergency containment, overflow and backup arrangements; standby power and pump redundancy; inflow monitoring with early warning; agreed community and regulator notification arrangements (see SCSTP Priority Measures below)
Post-mitigation likelihood	2, unlikely
Post-mitigation magnitude	4, high
Residual significance	Medium
Significant conversion or degradation	No, under designed and managed conditions. A severe or prolonged uncontrolled release is a credible significant degradation scenario
Residual management	Consequence severity cannot be reduced below serious harm, so management concentrates on likelihood and on response capability. Bypass activation register; quarterly verification of containment and standby arrangements; annual response exercise; immediate notification to the Project Execution Unit, the Environmental Protection Department, the Coastal Zone

Field	Assessment
	Management Unit and the Ministry of Health, and to potentially affected residents

7.1.2.3. STP-EI-05 Effluent Quality Following the Upgrade

STP-EI-05 is the principal beneficial effect of the SCSTP component and it is assessed against a quantified starting point. Sampling on 16 April 2026 recorded the works discharging suspended solids at 142 mg/L against 89 mg/L entering it, biochemical oxygen demand falling only from 215 to 205 mg/L, ammonia removal of approximately 26 percent against a design expectation of 70 to 90 percent, total phosphorus at 4.7 mg/L against an environmental limit of 0.025 mg/L, copper at 1.72 mg/L against a regulatory limit of 1.0 mg/L, and fecal coliforms and enterococci exceeding safe limits by orders of magnitude. For several parameters the effluent leaving the works is worse than the influent entering it, which identifies the plant itself as a continuing source acting on the receiving environment.

The benefit is therefore the removal of that source rather than an incremental improvement, and it is rated as a positive effect of high magnitude. It is nevertheless conditional. It is realized only on completion and commissioning of the upgraded process train, and its full value depends on the reclamation facility being operational to receive the treated stream, since the disposition of that stream is what removes the coastal discharge pathway. Until both conditions are met the existing condition persists, and the assessment does not record the improvement as a confirmed outcome.

Table 53 sets out the assessment of this pathway.

Table** 53**: STP-EI-05 Effluent quality following the upgrade: impact assessment

Field	Assessment
Activity	Completion and commissioning of the upgraded treatment process, and transfer of the treated stream to the reclamation facility for beneficial use
Potential impact	Improvement in effluent quality at the receiving environment, and removal of the continuing pollutant source identified in the April 2026 sampling
Risk	That the benefit is not realized, or is realized only in part, where the works are not completed, where process performance is not verified, or where the reclamation facility is not operational to receive the treated stream
Nature and type	Beneficial, direct and indirect, operation phase
Extent	Local to regional, extending through the wetland system to the coastal receiving environment
Duration	Long-term, for the operational life of the upgraded facility
Likelihood	4, likely. The works are contracted and under construction, and the improvement follows directly from the process design
Magnitude	4, high and positive. The change is measurable against a quantified baseline in which the plant currently exceeds the marine limit for suspended solids by a factor of approximately five and the environmental limit for total phosphorus by two orders of

Field	Assessment
	magnitude
Pre-mitigation significance	Very High, positive
Mitigation summary	Measures here are enhancement and verification rather than mitigation. Commissioning and performance testing against the design standard before handover; confirmation that the reclamation facility is able to receive the treated stream at the design quality; a defined effluent monitoring program at the plant outlet and in the receiving environment establishing the improvement against the April 2026 baseline; disclosure of performance data to the Environmental Protection Department and to residents (Section 8.5.2, Section 8.4.11)
Post-mitigation likelihood	5, highly likely with commissioning verification in place
Post-mitigation magnitude	4, high and positive
Residual significance	Very High, positive
Significant conversion or degradation	Not applicable. The effect on KBF 1, KBF 2 and KBF 5 is positive, through removal of a continuing pollutant source acting on Critical Habitat
Residual management	Monitoring M-01 and M-14 establish post-upgrade effluent and coastal water quality against the April 2026 baseline; performance is reported to the Project Execution Unit and disclosed to residents annually; where commissioning demonstrates that the design standard is not achieved, the shortfall is treated as a corrective action under Section 8.5.4 rather than as an accepted operating condition

7.1.2.4. STP-EI-11 Alteration of the Existing Wetland Conveyance

The existing outflow conveyance runs southward through the Southern Wetland Interface toward the coastal outlet at Sandy Beach, with two pumping stations recorded at field verification station FV-06. That infrastructure sits inside the Core Critical Habitat Area. The upgrade changes the disposition of the treated stream, since treated water is expected to be directed to the reclamation facility for reuse in place of conveyance to the coastal outlet, and the future of the conveyance is consequently unsettled.

Three options carry different assessments. Retention as redundancy leaves the asset in place and requires no works within Critical Habitat but preserves a discharge pathway that would need to remain maintained and monitored. Decommissioning in place involves limited works and leaves the structure as a permanent inert feature within the wetland. Removal constitutes works within Critical Habitat and carries direct disturbance to KBF 1, KBF 2 and KBF 5. The assessment below rates the pathway on the removal case, as the option carrying the highest exposure, and records that the rating is revisited once the configuration is settled.

Table 54 sets out the assessment of this pathway.

Table** 54**: STP-EI-11 Alteration of the existing wetland conveyance: impact assessment

Field	Assessment
Activity	Retention, decommissioning in place, or removal of the existing outflow conveyance and the two pumping stations recorded at station FV-06, within the Southern Wetland Interface
Potential impact	Physical disturbance to wetland substrate, vegetation and hydrology during works; or, on retention, persistence of a discharge pathway into Critical Habitat
Risk	Disturbance to the hydrological and ecological processes supporting Graeme Hall, sediment mobilization within the wetland, disturbance to nesting, roosting and foraging birds during works, and alteration of the connection between the wetland and the coast
Nature and type	Adverse, direct and indirect, construction phase; or a retained operational pathway
Extent	Local, within the Core Critical Habitat Area, extending to the coastal connection
Duration	Temporary for the works themselves, permanent in respect of the change to the conveyance configuration
Likelihood	3, possible. The works are not yet committed, and the option selected determines whether the pathway is activated at all
Magnitude	4, high. Works inside confirmed Critical Habitat acting on KBF 1, KBF 2 and KBF 5, in a system with reduced tidal flushing and limited capacity to absorb further disturbance
Pre-mitigation significance	High
Mitigation summary	Confirm the future configuration of the conveyance before any works affecting it; where removal is proposed, obtain Critical Habitat review under the Rapid Critical Habitat Assessment framework before implementation, with a method statement covering access, plant, working season, sediment control and reinstatement; avoid works during the migratory and breeding periods identified for KBF 3; prohibit access outside a demarcated corridor; supervision by a qualified ecologist; demonstrate that the change will not materially alter wetland hydrology, water quality, salinity or ecological functioning (Section 8.3, Section 8.4)
Post-mitigation likelihood	2, unlikely that works proceed without the Critical Habitat review and controls in place
Post-mitigation magnitude	3, moderate. Measurable but localized and recoverable disturbance under a supervised method statement
Residual significance	Medium
Significant conversion or degradation	No, a rapid Critical Habitat assessment was completed before implementation and works proceed under a supervised method statement. Works within the Southern Wetland Interface would not constitute a credible degradation scenario once the appropriate measures are followed.
Residual management	Configuration decision recorded and notified to the Project Execution Unit and the Environmental Protection Department before works; ecological supervision records for the duration of any works; turbidity monitoring at the works interface and downstream

Field	Assessment
	under M-03; reinstatement verified at completion and at six months

7.1.2.5. STP-EI-15 Accidental and Emergency Release

The upgrade introduces chemical storage and dosing, standby generation and fuel handling to a site that sits within the 100-year floodplain and drains, through the bypass and the existing conveyance, into confirmed Critical Habitat. This pathway is distinct from the discharge pathways at STP-EI-01 and STP-EI-02, which concern sewage and partially treated effluent. What is assessed here is the uncontrolled release of chemicals, fuel or process water, which reaches the same receptors by the same routes but arises from different activities and is controlled by different measures.

The pathway is assessed on the same basis as its counterpart at the reclamation facility, because the two sites are adjacent, drain to the same receiving environment and will hold chemical and fuel stocks concurrently. The controls are correspondingly common, and the emergency arrangements operate as one set across both facilities and the workers' camp rather than three.

Table 55 sets out the assessment of this pathway.

Table** 55**: STP-EI-15 Accidental and emergency release: impact assessment

Field	Assessment
Activity	Chemical and fuel storage, handling and refueling during construction and operation; dosing systems; standby generation; process water containment; plant failure or overflow
Potential impact	Uncontrolled release of chemicals, fuel or process water reaching the Bisecting Canal, the Eastern Marsh or connected drainage pathways
Risk	Contamination of Critical Habitat, with effects on hydrology, water quality and species features, in a system with reduced tidal flushing and limited capacity to dilute or export what enters it
Nature and type	Adverse, direct and indirect, construction and operation
Extent	Local, extending to the wetland system and the coastal connection
Duration	Temporary for a contained event, long-term for a substantial release
Likelihood	2 to 3, unlikely to possible with controls. Construction alongside an operating plant raises handling frequency during the works
Magnitude	5, catastrophic for a major uncontrolled release affecting Critical Habitat
Pre-mitigation significance	High to Very High
Mitigation summary	Storage and refueling located away from the bypass discharge point, the conveyance corridor and connected drainage; secondary containment sized for the largest vessel plus rainfall allowance; spill response equipment on site with trained responders; response arrangements explicitly recognizing Graeme Hall as Critical Habitat and

Field	Assessment
	providing for immediate containment and notification; engineering confirmation of emergency containment, overflow and plant failure arrangements before operation; storage raised above the 100-year flood level
Post-mitigation likelihood	2, unlikely
Post-mitigation magnitude	4, high. Containment reduces the probability of a release reaching the wetland; it does not reduce the consequence if one does
Residual significance	Medium
Significant conversion or degradation	No, under normal operations. A substantial uncontrolled release is a credible significant degradation scenario
Residual management	Weekly containment inspection and inspection after any flood event; annual response exercise held jointly with the reclamation facility and the camp; notification within four hours to the Project Execution Unit, the Environmental Protection Department and the Coastal Zone Management Unit, and within twelve hours to potentially affected residents

7.1.3. Impact Assessment: Odor, Air and Noise

These three pathways act on the same community receptors, at approximately 250 meters from the site boundary, and on a population in which 25.8 percent of residents are aged 65 and over and 373 are recorded as retired and therefore present during the working day. Two of them, air quality and noise, are increments upon conditions that already sit at or near the applicable guideline values, and the third, odor and hydrogen sulfide, is a continuing feature of an operating sewage works that construction disturbs. They are assessed separately here and their combined effect on quality of life is assessed at PRJ-SI-06 of the reclamation facility chapter, which applies across the Program.

7.1.3.1. STP-EI-03 Odor, Hydrogen Sulfide and Bioaerosols

Table 56 sets out the assessment of this pathway.

Table** 56**: STP-EI-03 Odor, hydrogen sulfide and bioaerosols: impact assessment

Field	Assessment
Activity	Construction on and around an operating plant; opening of tanks and channels; bypass operation; sludge and screenings handling; disturbance of established process conditions
Potential impact	Release of odor compounds, hydrogen sulfide and biological aerosols at concentrations reaching community receptors
Risk	Headache, nausea and respiratory irritation; reduced amenity and anxiety; acute toxicity at elevated concentration
Nature and type	Adverse, direct, construction and operation
Extent	Local

Field	Assessment
Duration	Short-term and intermittent during construction, long-term where operational odor control is inadequate
Likelihood	4, likely. Construction interfaces with an operating plant are inherently disruptive to odor control
Magnitude	3, moderate. Symptomatic effects at a residential receptor 250 meters distant, acting on a population in which 25.8 percent are aged 65 and over
Pre-mitigation significance	High
Mitigation summary	Continuous hydrogen sulfide monitoring with alarm at the site boundary and the nearest community receptor; odor management procedure for tank opening, bypass and sludge operations; scheduling of high odor operations with reference to wind direction; advance community notification of planned high odor works; enclosure and spray suppression; restriction of aerosol generating activity in adverse wind (see SCSTP Management Measures by Pathway)
Post-mitigation likelihood	3, possible
Post-mitigation magnitude	2, low
Residual significance	Medium
Residual management	Odor complaint log with response within 24 hours; quarterly review of monitoring against guideline values; immediate cessation of the causal activity and notification to the Project Execution Unit within four hours on any exceedance of the alarm threshold

7.1.3.2. STP-EI-06 Air Quality and Dust

The project-wide air quality assessment applies to this component. The SCSTP-specific addition is the demolition and removal of redundant structures, which the reclamation facility does not generate. April 2026 baseline monitoring recorded particulate matter within guideline values at the upwind locations, and 24.64 µg/m^3 $PM_{2.5}$ and 59.61 µg/m^3 PM_{10} over twelve hours at Location 1, above the World Health Organization 24-hour guidelines of 15 and 45 µg/m^3 respectively, although the twelve-hour averaging period is not directly comparable. Saharan dust between June and August raises particulate concentrations independently of Project activity and compounds construction dust in that period.

Table 57 sets out the assessment of this pathway.

Table** 57**: STP-EI-06 Air quality and dust: impact assessment

Field	Assessment
Activity	Demolition and removal of redundant structures, excavation, material handling, stockpiling, vehicle movements on unpaved surfaces, and cutting and grinding during mechanical and electrical installation
Potential impact	Elevated particulate concentrations and deposited dust at community, school and wetland margin receptors, including respirable crystalline silica and, where present in older structures, asbestos fibers
Risk	Respiratory irritation and aggravation of pre-existing respiratory and cardiovascular conditions; soiling and amenity loss; deposition on wetland vegetation and water surfaces
Nature and type	Adverse, direct, construction phase
Extent	Local, within approximately 500 meters of the site boundary
Duration	Short-term and intermittent, concentrated in the demolition and earthworks stages
Likelihood	4, likely without controls. Demolition of concrete process structures is inherently dust generating and the nearest residential area lies approximately 250 meters southeast
Magnitude	3, moderate. Measurable change requiring management and recoverable, acting on a receptor population in which 25.8 percent are aged 65 and over and two schools lie in the vicinity, and compounded seasonally by Saharan dust
Pre-mitigation significance	High
Mitigation summary	Asbestos and hazardous material survey of all structures before demolition, with licensed removal of any material identified; water suppression at demolition, excavation and haul routes, with suppression intensified during the June to August Saharan dust period; covered stockpiles and covered loads; wheel wash at the site exit and daily road cleaning; shade cloth and screening at the boundary facing the residential receptor; sequencing of high dust operations with reference to wind direction; continuous particulate monitoring at the community and school receptors; a work stop trigger on visible dust migration beyond the boundary (Section 8.3, Section 8.5.4)
Post-mitigation likelihood	2, unlikely
Post-mitigation magnitude	2, low
Residual significance	Low
Residual management	Monitoring M-07, continuous particulate monitoring at community and school receptors reported monthly against the adopted guideline; work stoppage on visible dust migration beyond the boundary toward a residential or school receptor; dust complaints logged and closed within seven days; asbestos survey and clearance certificates retained and disclosed to the Project Execution Unit before demolition begins

7.1.3.3. STP-EI-07 Noise and Vibration

Noise at this component is an increment upon an existing exceedance rather than a new exposure. Monitoring on 15 to 17 April 2026 recorded the nearest residential cluster at Location 3 between 56.3 and 60.5 dB(A) during the day, at or above the 55 dB(A) World Health Organization Community Noise guideline for serious annoyance in outdoor living areas adopted under the National Noise Policy. Location 2, within the existing facility compound downwind of the pump, was identified as the most significant existing source at an average of 63.8 dB(A), and Location 7 at the security hut recorded the highest maximum at 89.2 dB(A). The plant is therefore already a contributor to the ambient condition against which construction noise is assessed.

Two constraints are specific to this component. Demolition and excavation adjacent to live process units limit the substitution of low-noise methods, since access and sequencing are governed by the requirement that treatment continues throughout the works. And camp construction, SCWRRF construction and the operating plant contribute to the same acoustic environment, so receptor exposure is a combined Project exposure and is managed through coordinated scheduling rather than by each component alone. The occupational limits recorded in the HSE Management Manual, at 85 dB(A) LAeq(8h) during normal hours and 65 dB(A) LAeq(4h) during restricted hours, govern worker exposure and are distinct from the community guideline values applied here.

Table 58 sets out the assessment of this pathway.

Table** 58**: STP-EI-07 Noise and vibration: impact assessment

Field	Assessment
Activity	Demolition, excavation, piling and breaking, plant and generator operation, material handling, and heavy vehicle movements, alongside the continuing operation of the existing plant
Potential impact	Elevated noise and vibration at residential and school receptors, incremental to an ambient condition already at or above the daytime guideline value
Risk	Serious annoyance, sleep disturbance where works extend beyond daytime hours, interference with teaching at the two schools in the vicinity, and structural or cosmetic damage from vibration at nearby structures
Nature and type	Adverse, direct, construction phase
Extent	Local, within approximately 500 meters of the site boundary
Duration	Short-term, intermittent through the construction program
Likelihood	4, likely. The baseline already sits at or above the guideline value, so any material construction increment produces an exceedance
Magnitude	3, moderate. Measurable change requiring management and recoverable on completion, acting on a receptor population in which 41.1 percent are aged 55 and over and 373 residents are recorded as retired and therefore present during the working day
Pre-mitigation	High

Field	Assessment
significance	
Mitigation summary	Noise Management Plan setting working hours, restricted-hour limits and permitted high-noise activities; selection of low-noise plant and use of acoustic screening at the boundary facing the residential receptor and the schools where method allows; scheduling of the highest-noise activities outside school hours and outside the restricted evening period; coordinated scheduling with SCWRRF and camp works so that simultaneous high-noise activity at shared receptors is avoided; vibration monitoring and a pre-condition survey of structures within the influence zone before breaking and piling; advance notification of high-noise works; boundary monitoring against the WHO Community Noise guideline values (Section 8.3, Section 8.5.2)
Post-mitigation likelihood	3, possible. The ambient exceedance limits the extent to which the Project increment can be reduced below the guideline value
Post-mitigation magnitude	2, low
Residual significance	Medium
Residual management	Monitoring M-08, noise at residential and school boundaries measured monthly and on complaint against the WHO Community Noise Guideline values, with a target of zero exceedances; noise complaints logged and closed within seven days; quarterly review of the works program with the two school administrations; where monitoring records a sustained exceedance attributable to the Project, the causal activity is rescheduled or the method changed under the corrective action process at Section 8.5.4

7.1.4. Impact Assessment: Waste, Sludge and Materials

This group covers the material streams generated by the upgrade and the pathways by which they reach receptors. Two features are specific to this component. The upgrade generates a construction and demolition waste stream, including the possible presence of asbestos in structures of the plant's age, which the reclamation facility does not. Furthermore, restoring biological treatment increases sludge production, so the arrangements applying during construction are not those that will apply in operation. Vector breeding is assessed in this group because its principal driver on a works site is standing water associated with excavation, drainage interruption and stored materials, and because the Ministry of Health fish breeding station that provides the natural control lies adjacent to the plant.

7.1.4.1. STP-EI-04 Sludge and Screenings

Sludge and screenings are assessed as a single pathway because they share handling, storage, transport and disposal arrangements and because both act on the same receptors through odor, vector attraction and leachate. The upgrade changes the quantity and the character of the stream: restoring biological treatment to a works currently achieving negligible organic load removal increases biosolids production, so the arrangements that apply during construction are not the arrangements that will apply in operation. Quantities and characteristics are confirmed at detailed design and the assessment is revisited at that point.

Table 59 sets out the assessment of this pathway.

Table** 59**: STP-EI-04 Sludge and screenings: impact assessment

Field	Assessment
Activity	Removal, handling, dewatering, storage and off-site transport of sludge and screenings from the existing works during construction, and from the upgraded process in operation
Potential impact	Odor and bioaerosol release during handling; leachate and spillage from storage and transport; disposal at an unauthorized site
Risk	Amenity loss and symptomatic effects at the residential receptor approximately 250 meters southeast; mosquito breeding and vector attraction; contamination of the karst aquifer, which provides limited natural attenuation, and of the drainage pathway toward the wetland
Nature and type	Adverse, direct and indirect, construction and operation
Extent	Local, extending along the haulage route to the government-approved disposal site
Duration	Short-term and recurrent during construction; long-term through operation
Likelihood	4, likely without controls. Sludge production rises as the upgrade restores biological treatment, and existing handling arrangements are not documented
Magnitude	3, moderate. Measurable amenity, vector and contamination effects requiring management and recoverable, acting on an aged receptor population and on an aquifer with limited attenuation capacity
Pre-mitigation significance	High
Mitigation summary	Sludge and Residuals Management Plan confirming quantities, characteristics, dewatering arrangements and the disposal route before the upgrade alters sludge production; enclosed or covered storage sited away from the site boundary and from drainage pathways; impermeable bunded handling areas with leachate capture; sealed and covered transport by an authorized contractor to a government-approved disposal site with waste transfer documentation for every load; scheduling of handling operations with reference to wind direction; advance community notification of planned high-odor sludge operations (Section 8.3, Section 8.4.11)
Post-mitigation likelihood	2, unlikely
Post-mitigation magnitude	2, low
Residual significance	Low
Residual management	Monitoring M-06, sludge and screenings quantities and disposal records verified monthly with a target of 100 percent to a government-approved site; odor complaints logged under M-05 with response within 24 hours; weekly inspection of handling and storage areas for standing water under M-12; leachate capture integrity inspected weekly and after rainfall

7.1.4.2. STP-EI-09 Waste, Spoil, Demolition Material and Hazardous Materials

The Barbados waste framework applies in full. Barbadian law categorizes waste as refuse, rubbish and swill, and the operative categories for this component are municipal solid waste, recyclable waste, organic and green waste, construction and demolition waste, special care and hazardous waste, and bulk and white waste. The SCSTP upgrade generates a construction and demolition stream that the reclamation facility does not, arising from the removal of redundant process structures, and that stream carries the possibility of asbestos and other hazardous materials in structures of the plant's age. Illegal dumping is already an existing pressure at the Eastern Marsh, recorded during field verification, so waste discipline on this site carries weight beyond the site boundary.

Table 60 sets out the assessment of this pathway.

Table** 60**: STP-EI-09 Waste, spoil, demolition material and hazardous materials: impact assessment

Field	Assessment
Activity	Generation, segregation, storage, transport and disposal of construction and demolition waste, spoil, packaging, general site waste, and hazardous materials including fuels, oils, solvents, batteries and any asbestos-containing material
Potential impact	Uncontrolled disposal, windblown litter, leachate from stored waste, and release of hazardous material to ground or to drainage
Risk	Contamination of the karst aquifer and of the wetland drainage pathway; occupational and community exposure to asbestos fibers during demolition; reinforcement of the existing illegal dumping pressure at the Eastern Marsh; loss of landfill capacity
Nature and type	Adverse, direct and indirect, construction phase
Extent	Local, extending to the disposal site and to the wetland via drainage
Duration	Short-term, concentrated in the demolition and construction stages, with the potential for lasting effect where hazardous material is released
Likelihood	3, possible. Waste arisings are certain, but escape from a managed system is a matter of discipline rather than inevitability
Magnitude	4, high. The general waste stream is of moderate magnitude, but release of asbestos or other hazardous material during demolition is a serious change with a sustained effect and uncertain recovery, and that case governs the rating
Pre-mitigation significance	High
Mitigation summary	Asbestos and hazardous material survey of every structure before demolition, with licensed removal, containment and disposal of any material identified and clearance certification before general demolition proceeds; Demolition and Hazardous Material Management Plan; segregation at source with labeled and covered skips; impermeable bunded storage for fuels, oils and chemicals away from drainage pathways; a spoil balance identifying reuse on site and the destination of surplus; transport by an authorized contractor to a government-approved disposal site with waste transfer documentation for every load; prohibition of on-site burning and of any disposal outside the approved route (Section 8.3)

Field	Assessment
Post-mitigation likelihood	2, unlikely
Post-mitigation magnitude	2, low
Residual significance	Low
Residual management	Waste transfer records reconciled monthly against arisings, with any unaccounted stream investigated within seven days; hazardous material storage inspected weekly; asbestos survey and clearance certificates retained and disclosed to the Project Execution Unit before demolition; site perimeter inspected weekly for windblown material and for evidence of dumping at the wetland margin

7.1.5. STP-EI-10 Vector Breeding

Vector-borne disease is the health concern most consistently raised by residents adjacent to the swamp, and it is the concern recorded as primary in consultation for this location. Three disease-competent mosquito species are present in Graeme Hall Swamp. The hydrological condition of the wetland has raised breeding potential independently of the Project: blocking of the canal to the sea has reduced saltwater intrusion and the system has become predominantly freshwater, and the species of public health concern do not breed in brackish water. The larvivorous fish that provide the second natural control are restricted in their movement where canals become clogged, which is why keeping canals clear is treated as a vector control measure and not solely as a drainage function.

The Ministry of Health manages the eastern section of the swamp for mosquito control and operates a fish breeding station adjacent to the plant producing larvivorous fish for distribution in the waterways. That facility is a public health asset within the Project environs and its protection is a requirement of this assessment, not a discretionary courtesy. Construction adds standing water in excavations, trenches, tanks, drums, plant and stored materials, and it introduces the possibility of disturbance, runoff and access interference at the breeding station itself.

Table 61 sets out the assessment of this pathway.

Table** 61**: STP-EI-10 Vector breeding: impact assessment

Field	Assessment
Activity	Excavation and trenching, temporary drainage interruption, storage of materials and plant capable of retaining water, and works adjacent to the Ministry of Health fish breeding station
Potential impact	Creation of mosquito breeding sites on and around the works area, and impairment of the fish breeding station through disturbance, sediment-laden runoff or interference with staff access
Risk	Increased transmission of dengue, chikungunya, Zika and other vector-borne disease in a community that identifies mosquitoes as its primary health concern, compounded where the natural control provided by larvivorous fish is simultaneously weakened

Field	Assessment
Nature and type	Adverse, direct and indirect, construction phase
Extent	Local, extending across the wetland margin and the surrounding residential area
Duration	Short-term and recurrent, concentrated in the wet season
Likelihood	4, likely without controls. Standing water accumulates readily on an active works area in a wet tropical climate, and the works coincide with the June to November wet season
Magnitude	3, moderate. Measurable increase in breeding opportunity requiring management and recoverable, acting on a community already carrying elevated background risk and on a vulnerable receptor population
Pre-mitigation significance	High
Mitigation summary	Weekly inspection of the works area for standing water, with elimination within 24 hours of identification and additional inspection after rainfall; drainage of excavations and covering or inversion of water-retaining plant and materials; maintenance of temporary drainage so that flow is not impounded; agreed protection arrangements for the fish breeding station comprising exclusion, runoff and sediment control and maintained staff access, settled with the Ministry of Health before works commence; coordination of works scheduling with Ministry of Health clearing and fogging programs; worker and community awareness on breeding site elimination (Section 8.4, Section 8.5.2)
Post-mitigation likelihood	2, unlikely
Post-mitigation magnitude	2, low
Residual significance	Low
Residual management	Monitoring M-12, standing water and vector breeding sites inspected weekly and after rainfall with elimination within 24 hours; Monitoring M-13, fish breeding station condition and access inspected monthly with a target of no disturbance and access maintained; any disturbance to the fish breeding station is a work stoppage trigger under Section 8.5.4; vector-related grievances tracked separately within the grievance register and reviewed monthly with the Ministry of Health

7.1.6. STP-EI-13 Energy Demand and Greenhouse Gas Emissions

The upgrade changes the energy profile of the plant. Restoring biological treatment, aeration and disinfection to a works currently achieving negligible removal raises operational energy demand above the present level, while construction adds a temporary demand from plant, generation and haulage. The Contract stipulates a non-carbon emissions agreement, against which that change must be recorded. Greenhouse gas parameters were not included in the April 2026 baseline sampling, which is an acknowledged gap: carbon dioxide, methane and other greenhouse gases are to be added to the Project monitoring program. Methane and nitrous oxide are material at a wastewater treatment works in a way

that they are not at a general construction site, since both are process emissions of anaerobic and biological treatment stages.[112]

The solar photovoltaic plant of 7 megawatts with battery storage, delivered under Component 3, bears on this pathway. It generates for consumption by the Project and is not configured to export power to the national grid, so its effect is a reduction in the Project's purchased electricity and in the indirect emissions associated with that purchase. National generation remains dominated by fossil fuels, with heavy fuel oil at 37 percent, diesel at 18 percent and gasoline at 17 percent of the energy mix, so displaced grid consumption carries a correspondingly high emissions factor and the reduction is material in proportion to operational demand. Three qualifications apply to that credit. The plant is delivered outside the design and build contract assessed in this document, so the reduction is contingent on its completion and on its commissioning in step with facility operation. The quantum cannot be stated until the operational energy demand of the facility is confirmed, which is recorded among the outstanding design items. And the emissions account for the Project should record purchased electricity, on-site standby generation and solar output as separate figures, so that the net position is verified against the Contract commitment on carbon emissions and is not inferred from a single combined total.

Table 62 sets out the assessment of this pathway.

Table** 62**: STP-EI-13 Energy demand and greenhouse gas emissions: impact assessment

Field	Assessment
Activity	Construction plant, generation and haulage during the works; and, in operation, aeration, pumping, disinfection and sludge processing at the upgraded plant, together with process emissions of methane and nitrous oxide from treatment stages
Potential impact	Increase in energy demand and in direct and indirect greenhouse gas emissions relative to the present operating condition
Risk	Non-compliance with the Contract non-carbon emissions commitment, and an unquantified operational emissions profile carried into the operational phase without a baseline against which to measure it
Nature and type	Adverse, direct and indirect, construction and operation; global in effect
Extent	Transboundary and international in effect, with the compliance obligation arising at Project level
Duration	Short-term for construction; long-term for operation
Likelihood	5, highly likely. An increase in operational energy demand follows directly from restoring treatment performance
Magnitude	2, low. The absolute emissions of a single municipal treatment works are small in a global frame, and the operational increase is the direct consequence of an

[112] Standard Bidding Document for Design and Build of Civil Works, Barbados Climate Resilient South Coast Water Reclamation Project, Section VI Employer's Requirements, environmental and social obligations, and Section VIII Particular Conditions of Contract, non-carbon emissions agreement and ESHS progress reporting metrics. (Standard Bidding Document for Design and Build of Civil Works: Barbados Climate Resilient South Coast Water Reclamation Project, n.d.)

Field	Assessment
	environmental improvement
Pre-mitigation significance	High
Mitigation summary	Add carbon dioxide, methane and other greenhouse gases to the Project monitoring program and establish the operational emissions baseline before and after the upgrade; energy efficiency in the selection of aeration, pumping and dosing equipment at detailed design; assessment of renewable generation and heat or biogas recovery where the process configuration permits; minimization of generator running through early permanent power connection; haulage trip optimization under the integrated movement plan; annual reporting of energy use and emissions against the Contract non-carbon commitment (Section 8.5.2, Section 8.5.6)
Post-mitigation likelihood	5, highly likely. The demand increase is inherent to the improvement and is managed rather than avoided
Post-mitigation magnitude	1 to 2, negligible to low
Residual significance	Medium to High
Residual management	Greenhouse gas parameters added to the monitoring program and reported annually against the Contract non-carbon emissions agreement; energy consumption metered separately for the upgraded process units; the net position recorded alongside the environmental benefit at STP-EI-05, so that the emissions increase is read against the pollutant load removed rather than in isolation

7.1.7. STP-EI-12 Chance Find of Cultural Heritage

Excavation is proposed, which engages Performance Standard 8 irrespective of whether cultural heritage sites are identified within the DAI. No cultural heritage receptor has been identified at the SCSTP footprint, and the pathway is accordingly a chance find pathway rather than a known-resource pathway. The requirement is procedural: a Chance Find Procedure setting out the stop-work trigger, the notification route, the holding arrangements and the authority to resume works must be in place before excavation begins.

Table 63 sets out the assessment of this pathway.

Table** 63**: STP-EI-12 Chance find of cultural heritage: impact assessment

Field	Assessment
Activity	Excavation, trenching, demolition below ground level, and foundation works
Potential impact	Disturbance, damage or loss of previously unrecorded archaeological or cultural heritage material encountered during ground works
Risk	Irreversible loss of heritage value, and non-compliance with Performance Standard 8 and with national heritage requirements

Field	Assessment
Nature and type	Adverse, direct, construction phase
Extent	On-site
Duration	Permanent where material is damaged or removed without record
Likelihood	2, unlikely. No cultural heritage receptor is identified in the Area of Influence and the site is previously developed
Magnitude	3, moderate. Any loss would be irreversible for the item concerned, though the probability of a significant find on a developed footprint is low
Pre-mitigation significance	Medium
Mitigation summary	Chance Find Procedure prepared and adopted before excavation begins, setting the stop-work trigger, the securing and holding arrangements for any find, the notification route to the relevant national authority through the Project Execution Unit, and the authority under which works may resume; induction of all excavation personnel and machine operators in the recognition and reporting of finds; the procedure incorporated into the permit-to-work system for ground works (Section 8.3)
Post-mitigation likelihood	2, unlikely
Post-mitigation magnitude	1, negligible, with the procedure operating as intended
Residual significance	Low
Residual management	Chance Find Procedure maintained and its induction recorded for every person engaged in ground works; any find registered, notified within 24 hours and works in the affected area suspended until written resumption authority is given; the procedure reviewed annually and after any activation

7.1.8. Impact Assessment: Traffic, Road Safety and Operational Interface

Two pathways are grouped here because both concern the movement of people and vehicles through spaces occupied by others. Traffic and road safety carries the highest pre-mitigation rating of any pathway in this assessment alongside the gender-based violence pathway, and it is assessed once for the shared access route rather than separately for each component. The construction and operations interface is specific to this facility: works proceed on and around process units that must continue to operate, which places construction personnel, plant operations personnel and live process hazards in the same space.

7.1.8.1. STP-EI-08 Traffic and Road Safety

The project-wide traffic and road safety assessment applies to this component, and the assessment at PRJ-EI-07 of the reclamation facility chapter sets the rating for the shared access route. Two additions are specific to the SCSTP. The upgrade adds demolition-waste transport to the movement profile, and sludge haulage from the reclamation facility, not from the plant, continues into operation on the same

route. The movement profile assessed here is the combined Program profile on the shared access route, and not SCSTP-generated traffic alone. And the movement profile on the shared route is not the sum of two separate assessments: the Workers' Camp assessment identifies construction traffic, material deliveries, sludge and waste transport and workforce movement all using the same narrow residential access road, with peak on-site numbers reaching 203 in the third quarter of 2028.

Table 64 sets out the assessment of this pathway.

Table** 64**: STP-EI-08 Traffic and road safety: impact assessment

Field	Assessment
Activity	Heavy vehicles, deliveries, plant movements, sludge haulage from the reclamation facility, demolition-waste transport and commuter traffic transiting a narrow shared residential access road, alongside SCWRRF construction traffic and workers' camp movements
Potential impact	Collision with pedestrians, cyclists or vehicles; degradation of the road surface and sub-base; congestion and access impediment on the community route
Risk	Pedestrian strike, particularly of schoolchildren and accompanying caregivers at St. Luke's Academy and St Lawrence Primary School; serious injury or fatality
Nature and type	Adverse, direct, construction phase, continuing at reduced intensity into operation through sludge haulage from the reclamation facility on the shared route
Extent	Local, along the shared access route and its approach through Harmony Hall
Duration	Short-term and continuous through construction; long-term and intermittent in operation
Likelihood	4, likely without controls. Combined movements from three components compound through frequency on a single narrow route
Magnitude	5, catastrophic. Fatality is a credible outcome of a pedestrian strike by a heavy vehicle, and women accompanying children on foot are disproportionately exposed
Pre-mitigation significance	Critical
Mitigation summary	A single integrated Traffic and Pedestrian Management Plan across the SCSTP upgrade, the SCWRRF works and the workers' camp, with one set of transit windows, speed limits and staging arrangements; prohibition of heavy vehicle community transit between 07:00 and 08:00 and between 15:00 and 16:30; 15 kilometers per hour on the community access route and 10 at site entrances; trained traffic wardens at critical bends and access points; off-site vehicle staging with no queuing on public roads; routes avoiding school frontages; load optimization to reduce trip numbers, applied jointly across components; driver induction and refresher training; vehicle movement log; daily road condition inspection and prompt removal of mud and spillage; school engagement (Section 8.4, Section 8.4.11)
Post-mitigation likelihood	2, unlikely
Post-mitigation	4, high. Consequence severity cannot be reduced below serious injury

Field	Assessment
magnitude	
Residual significance	Medium
Residual management	Monitoring M-09, heavy vehicle movements within restricted school-hour windows audited weekly with a target of zero; Monitoring M-10, pedestrian near misses involving Project vehicles registered immediately and reported monthly with a target of zero; immediate driver suspension and investigation within 24 hours of any near miss, which is also a work stoppage trigger under Section 8.5.4; quarterly review with the two school administrations; a combined complaint register permitting attribution between the SCSTP, the SCWRRF and the camp

The cumulative movement profile is broader than SCSTP sludge and demolition traffic alone. The Workers' Camp assessment identifies construction traffic, material deliveries, sludge and waste transport, and workforce movement as using the same narrow access route. The Traffic and Pedestrian Management Plan should therefore operate as a single integrated movement plan across the SCSTP upgrade, SCWRRF works and workers' camp, with coordinated scheduling, speed controls, school-sensitive transit windows, near-miss reporting and complaint tracking.

7.1.9. STP-EI-14 Construction and Operations Interface

Table 65 sets out the assessment of this pathway.

Table** 65**: STP-EI-14 Construction and operations interface: impact assessment

Field	Assessment
Activity	Construction activity proceeding alongside live plant operations, with construction and operations personnel working in proximity and sharing access, services and space
Potential impact	Damage to live process units or services; interruption of treatment; injury at the interface; conflicting instructions and unclear authority
Risk	Unplanned treatment interruption leading to discharge; injury to construction or operations personnel; community consequence through discharge or emergency service demand
Nature and type	Adverse, direct, construction phase
Extent	On-site, with community consequence through discharge
Duration	Short-term, continuous through construction
Likelihood	3, possible
Magnitude	4, high, given the discharge consequence
Pre-mitigation significance	High
Mitigation	Permit to work system covering all activity affecting or adjacent to live units; single point of

Field	Assessment
summary	authority for taking units out of service; services location survey before excavation; segregation of construction and operations areas where practicable; joint briefing arrangements; escalation route for conflicting instructions (see SCSTP Management Measures by Pathway and the Health and Safety Management Plan for occupational elements)
Post-mitigation likelihood	2, unlikely
Post-mitigation magnitude	3, moderate
Residual significance	Medium
Residual management	Permit compliance audit; interface incident register; monthly joint review between construction and operations management

7.1.10. Beneficial Effects

Expected beneficial effects include improved effluent quality in the receiving environment, reduced reliance on preliminary treatment and ocean discharge, reduced likelihood of emergency bypass activation where the upgrade addresses the underlying causes, availability of treated effluent for reuse through the reclamation facility, employment and procurement, and skills transfer. Each benefit should be recorded together with the conditions on which it depends and distinguished from a confirmed outcome where those conditions are not yet settled.

Positive-impact assessment by phase:

During construction, temporary employment, local procurement, training and skills transfer are potential benefits, subject to local-access and fair-recruitment measures.

During operation, improved sewage treatment, more reliable service, reclaimed-water reuse and reduced exposure to untreated effluent are material benefits, subject to measured treatment performance and safe reuse.

At closure or decommissioning of temporary camp facilities, removal of temporary structures, remediation and restoration can produce benefits where verified. Benefits must be monitored separately from adverse or disproportionate effects on low-income households, informal workers, women, persons with disabilities and other vulnerable groups. Relevant actions are implemented through the LMP, SEP, GRM, Community Health Plan, HSE Plan and site restoration commitments; benefits are not assumed to offset adverse impacts automatically.

Two further beneficial effects arise from Component 3 and are recorded here as contingent on delivery of that component. The solar photovoltaic plant of 7 megawatts with battery storage reduces the Project's demand on a national grid supplied predominantly by imported fossil fuel, which lowers both operating cost exposure and the indirect emissions attributable to the Project. The restoration of the Graeme Hall Swamp Sanctuary acts directly on the receptor that this assessment identifies as the most

sensitive feature of the receiving environment, and it addresses pressures that are present independently of the Project, being nutrient enrichment, fecal contamination, pesticide and zinc residues, accumulated dumping, hurricane damage and the impaired condition of the sluice gate and the coastal exchange. Neither effect is delivered through the works assessed in this document, and neither is claimed as an outcome of those works. Both are recorded because the ecological condition of the wetland that the restoration addresses is the same condition against which the residual effects of these works are measured, and a change in that condition changes the baseline for this assessment.

7.1.11. Social Impact Assessment

PRJ-SI-01 employment, local hiring and procurement, PRJ-SI-02 labor influx and worker-community interaction, and PRJ-SI-03 sexual exploitation and abuse, sexual harassment and gender-based violence are assessed at Program level in the Social Impact Assessment, because the workforce, the accommodation arrangements, the recruitment routes and the community interface are common to both components and are governed by a single set of instruments. Those assessments apply to this component without variation and their ratings are carried into the summary of significance below. They are not reproduced here, and the subsections that follow record only what differs at this facility.

7.1.11.1. STP-SI-04 Community Health and Safety

Three community health pathways are specific to this facility: odor and hydrogen sulfide from an operating sewage works at 250 meters from the nearest residences, discharge of untreated or partially treated sewage on the bypass pathway, and vector breeding associated with standing water and with the hydrological condition of the wetland. The Community Health Assessment and Plan addresses persons outside the workforce and the routes by which conditions on site reach and potentially affect the community; occupational exposure remains under the HSE instruments.

Construction beside the operating plant also creates a workforce-health interface that is specific to this Project configuration. The camp assessment notes that odor, bioaerosol and emergency-discharge risks are heightened during the overall Program period because camp occupants are present beside an operating sewage treatment plant while construction is underway. Occupational exposure of workers remains under the HSE instruments and the camp related ESIA/ESMP, while community consequences and shared emergency-service demand are coordinated through the Community Health Plan and the Program-wide Emergency Response Plan.

Table 66 sets out the assessment of this pathway.

Table** 66**: STP-SI-04 Community health and safety: impact assessment

Field	Assessment
Activity	Construction on and around an operating sewage treatment works; bypass and discharge events; sludge and screenings handling; standing water on the works area; heavy vehicle movement on the shared community route
Potential impact	Community exposure to odor, hydrogen sulfide and bioaerosols; exposure to pathogens through discharge reaching the wetland, the coastal zone or recreational waters; increased vector breeding; injury on the access route
Risk	Headache, nausea and respiratory irritation; gastrointestinal and dermal illness following contact with contaminated water; dengue, chikungunya and Zika transmission; aggravation of pre-existing respiratory and cardiovascular conditions;

Field	Assessment
	injury or fatality
Nature and type	Adverse, direct and indirect, construction and operation
Extent	Local, extending to coastal and recreational waters through the discharge pathway
Duration	Short-term and intermittent during construction; long-term where operational controls are inadequate
Likelihood	4, likely without controls. Several distinct pathways act on the same population concurrently, and the discharge pathway has a documented history
Magnitude	4, high. The exposed population includes 433 residents aged 65 and over, 292 households headed by older persons, persons with chronic respiratory and cardiovascular conditions, and children at two schools; serious illness is a credible outcome of a substantial discharge event
Pre-mitigation significance	Very High
Mitigation summary	Community Health Plan covering persons outside the workforce, with the exposure pathways specific to this facility identified and monitored; continuous hydrogen sulfide monitoring with alarm at the site boundary and the nearest community receptor; Sewage Spill Response Protocol with defined containment and notification, including direct notification to potentially affected households within twelve hours of any discharge reaching the wetland or coastal zone; advisory arrangements for beach and recreational water users following a discharge event; vector control under STP-EI-10 in coordination with the Ministry of Health; integrated traffic controls under STP-EI-08; a shared emergency notification route between camp management, construction management and Barbados Water Authority plant operations (Section 8.3, Section 8.4)
Post-mitigation likelihood	2, unlikely
Post-mitigation magnitude	3, moderate. Residual exposure remains where a discharge or odor event occurs despite controls
Residual significance	Medium
Residual management	Health-related grievances tracked as a distinct category within the grievance register and reviewed monthly with the Ministry of Health; monitoring M-04, M-05, M-12 and M-13 reported monthly; post-event water quality monitoring under M-03 within 24 hours of any discharge event, with results disclosed to residents; annual review of the Community Health Plan against recorded grievances, monitoring results and Ministry of Health surveillance data

Construction beside the operating plant also creates a workforce-health interface. The camp assessment notes that odor, bioaerosol and emergency-discharge risks are heightened during the Project period because camp occupants are present beside an operating sewage treatment plant while construction is underway. Occupational exposure of workers remains under the HSE instruments and

camp ESIA/ESMP, while community consequences and shared emergency-service demand are coordinated through the Community Health Plan and Program-wide Emergency Response Plan.

7.1.11.2. STP-SI-05 Livelihood and Amenity Effects

Livelihood and amenity effects at this facility extend to the coast, which distinguishes them from the equivalent pathway at the reclamation facility. Discharge during construction affects beach and coastal water users and the visitor economy on which household income in the Area of Influence partly depends. Owner occupation stands at 60.3 percent of 667 households and private rental at 26.9 percent, so households renting to visitors carry direct exposure to any deterioration in coastal amenity or to public notification of a discharge event. Of persons aged 65 and over, 292 are recorded as household heads, and 373 residents are retired, so a substantial share of household income in the area is fixed and cannot be replaced through additional work.

Table 67 sets out the assessment of this pathway.

Table** 67**: STP-SI-05 Livelihood and amenity effects: impact assessment

Field	Assessment
Activity	Discharge and bypass events reaching the coastal zone; odor, dust, noise and traffic during construction; access restriction and congestion on the community route; visual change at the plant boundary
Potential impact	Loss of coastal and beach amenity; reduced visitor demand for accommodation and for services in the Area of Influence; disruption to informal vendors and to fishers using the wetland; reduced enjoyment of the residential environment
Risk	Income loss for owner-occupier households renting to visitors, for informal vendors whose income depends on physical presence at a location the Project may restrict, and for fishers recorded at station FV-02; and the knock-on effects of income loss, including food insecurity, reduced capacity to mitigate exposure privately and deferred health seeking
Nature and type	Adverse, direct and indirect, construction phase, with an operational tail where discharge events recur
Extent	Local, extending to the beach and coastal water downstream of the sluice gate
Duration	Short-term for construction nuisance; longer where a discharge event affects coastal water quality or triggers a public advisory
Likelihood	3, possible. Construction nuisance is certain; the coastal amenity effect depends on whether a discharge event occurs
Magnitude	3, moderate. Measurable income and amenity effects requiring management and recoverable, falling hardest on informal vendors and on fixed-income households
Pre-mitigation significance	Medium
Mitigation summary	Advance notification of planned bypass and high-odor operations, with a minimum notice period set in the Stakeholder Engagement Plan, so that accommodation providers and vendors can plan; direct notification to potentially affected households within twelve hours of any discharge reaching the wetland or coastal zone;

Field	Assessment
	maintenance of access to vendor locations and to the wetland for fishers, with alternative arrangements agreed where access must be interrupted; local procurement and hiring under the Labor Management Plan directed at the Area of Influence; a grievance route capable of receiving and resolving income-loss claims; nuisance controls under STP-EI-06, STP-EI-07 and STP-EI-03 (Section 8.3, Section 8.4.12)
Post-mitigation likelihood	2, unlikely for a material income effect
Post-mitigation magnitude	2, low
Residual significance	Low
Residual management	Livelihood-related grievances tracked as a distinct category and reviewed monthly, disaggregated by sex, age and by vendor, fisher and accommodation-provider status; vendor and fisher access verified at each monthly site inspection; coastal water quality monitored under M-14 during construction, with results disclosed so that accommodation providers and beach users have current information; any income-loss claim assessed against the Project's grievance procedure within the target closure time

7.1.11.3. STP-SI-06 Public Acceptance, Perception and Trust

This facility carries a history that bears directly on public trust, and that history is the substance of the pathway rather than its background. The 2005 discharge released between three and six million gallons of preliminary treated sewage, which traveled by overland flow across the government-owned spikerush marsh and into the Sanctuary lake. The reported absence of a confirmed spill protocol and the condition of the sluice gate, recorded as apparently inoperable during field verification in August 2026, are matters of public record. Residents living approximately 250 meters from an operating works also have current cause for concern: the April 2026 sampling establishes that the plant is discharging effluent worse than its influent on several parameters.

The consequence for the assessment is that the credibility of the notification arrangements is itself a determinant of public acceptance, and not merely a means of delivering it. Consultation on the upgrade proceeds on the basis that the existing condition is disclosed. Where the Program communicates about bypass risk without acknowledging the documented history, or where a discharge event occurs and notification is late or incomplete, the loss of trust is not recoverable through subsequent engagement.

Table 68 sets out the assessment of this pathway.

Table** 68**: STP-SI-06 Public acceptance, perception and trust: impact assessment

Field	Assessment
Activity	Disclosure and consultation on the upgrade; communication about bypass risk, planned high-odor works and discharge events; grievance handling; the visible condition and performance of the operating plant during construction
Potential impact	Loss of public confidence in the Project and in the operating authority; contested consultation; escalation of grievances outside the Project's own mechanism

Field	Assessment
Risk	Withdrawal of social license, delay to works, and a community less willing to act on public health advice following a discharge event, which converts a trust problem into a health consequence
Nature and type	Adverse, indirect, all phases
Extent	Local, extending nationally given the standing of Graeme Hall and the public record of the 2005 event
Duration	Long-term. Trust lost through a poorly handled event is not recovered within the Project period
Likelihood	4, likely without a deliberate disclosure approach, given the documented history and the current plant performance
Magnitude	3, moderate. Measurable effect on consultation, grievance volume and cooperation, recoverable but slowly
Pre-mitigation significance	High
Mitigation summary	Disclosure of current plant performance and of the improvement the upgrade is intended to deliver as part of the project overview at each town hall; direct engagement on what the bypass is, in what circumstances it activates, what the Project is doing to reduce that likelihood, what notification residents and coastal users will receive and what monitoring is in place; advance notification before any planned bypass or high-odor operation with a minimum notice period set in the Stakeholder Engagement Plan; direct notification to potentially affected households following any discharge event; grievance categorization that separates odor complaints, which are expected to form a significant proportion of grievances at this facility; sessions from 5:30 pm to about 7:00 pm to allow attendance after working hours; issues recorded against the component they concern
Post-mitigation likelihood	2, unlikely where disclosure is complete and notification is demonstrated in practice
Post-mitigation magnitude	2, low
Residual significance	Low
Residual management	Monitoring M-15, grievances received, resolved and outstanding reported monthly against a 90 percent closure target; the Stakeholder Issues and Response Log maintained and reviewed against the four engagement questions at Section 8.4.11, with the ESMP updated through an agreed corrective action where any answer is no; notification performance audited after every bypass or discharge event, recording the time to first notification and the channels used; attendance and disclosure summaries retained for each session

7.2. SCWRRF Environmental and Social Impact Assessment

This section applies the Program assessment methodology to the construction of the facility. It identifies the impact pathways specific to this component, assesses each against the likelihood and magnitude scales, and records the significant conversion or degradation determination where a Key Biodiversity Feature is engaged.

Social pathways PRJ-SI-01, PRJ-SI-02 and PRJ-SI-03 are assessed once at Project level because the workforce, the accommodation arrangements and the governing social instruments are common to both facilities and the workers' camp.

7.2.1. Introduction to the Assessment

Two characteristics of this facility shape the assessment. It occupies previously undeveloped land immediately upslope of confirmed Critical Habitat, and field verification established that it does not encroach on wetland habitat, so the material environmental risk is indirect rather than direct: it operates through runoff, drainage change and accidental release along a short pathway down the eastern gully to the Eastern Marsh. And it introduces two receptor routes that do not presently exist, aquifer recharge and agricultural reuse, which carry the highest operational exposure in this assessment and act on receptors well beyond the Area of Influence.

Several operational pathways are assessed at a screening level because the process design, the reclaimed water quality targets, the recharge arrangements and the site drainage design are not yet fixed. Each such rating states the condition on which it depends and the point at which it is revisited. These are identified conditions carried into the management plan rather than gaps left open, and they are listed together at Information Gaps and Assumptions below.

7.2.2. Impact Pathways Identified

Table 69 presents the impact pathways identified.

Table** 69**: Impact pathways identified

Ref	Pathway	Phase	Primary receptors
PRJ-EI-01	Runoff, sediment transport and water quality effects on the wetland	Construction	KBF 1, KBF 2, KBF 3, KBF 4, KBF 6
PRJ-EI-02	Vegetation clearance and terrestrial habitat loss on the footprint	Construction	KBF 6, KBF 4
PRJ-EI-03	Disturbance to fauna from noise, lighting and human presence	Construction and operation	KBF 3, KBF 4
PRJ-EI-04	Hydrological change from site drainage design and hard surfacing	Construction and operation	KBF 1, KBF 2
PRJ-EI-05	Air quality and dust at community and habitat receptors	Construction	Residents, schools, wetland margin
PRJ-EI-06	Noise and vibration at community receptors	Construction	Residents, schools

Ref	Pathway	Phase	Primary receptors
PRJ-EI-07	Traffic and road safety on the shared access route	Construction	Road users, schoolchildren, vendors
PRJ-EI-08	Waste, spoil and hazardous material management	Construction	Wetland, groundwater, community
PRJ-EI-09	Reclaimed water quality, aquifer recharge and agricultural reuse	Operation	Groundwater, agricultural users, KBF 1, KBF 2
PRJ-EI-10	Sludge and residuals handling and disposal	Operation	Community, disposal site, groundwater
PRJ-EI-11	Odor and bioaerosols from the reclamation process	Operation	Residents, workers
PRJ-EI-12	Energy demand and greenhouse gas emissions	Construction and operation	Global, and the Contract non-carbon commitment
PRJ-EI-13	Chance find of cultural heritage during excavation	Construction	Cultural heritage
PRJ-EI-14	Alteration or decommissioning of the existing wetland conveyance	Construction	KBF 1, KBF 2, KBF 5
PRJ-EI-15	Accidental or emergency release, including chemical, fuel and process water	Construction and operation	KBF 1, KBF 2, KBF 3, KBF 5, KBF 6
PRJ-EI-16	Vector breeding associated with standing water and works areas	Construction and operation	Community, wetland
PRJ-EI-17	Climate and natural hazards acting on facility integrity	Construction and operation	All receptors, KBF 1, KBF 2, KBF 5, south coast service area
PRJ-SI-01	Employment, local hiring and procurement	Construction and operation	Local workforce, businesses
PRJ-SI-02	Labor influx and worker community interaction	Construction	Community, workers
PRJ-SI-03	Sexual exploitation and abuse, sexual harassment and gender-based violence	Construction	Women and girls, students, migrant women, PwD
PRJ-SI-04	Community health and safety	Construction and operation	Residents, schoolchildren, vulnerable groups
PRJ-SI-05	Livelihood effects on fishers, vendors and visitor accommodation	Construction	Vendors, fishers, owner occupiers
PRJ-SI-06	Nuisance effects on amenity and quality of life	Construction	Residents, older persons
PRJ-SI-07	Public acceptance, perception and	All phases	Community, stakeholders

Ref	Pathway	Phase	Primary receptors
	trust		

7.2.3. Impact Assessment: Water, Drainage and the Wetland Pathway

This group carries the material environmental risk at the reclamation facility. Field verification established that the Project does not occupy or convert wetland habitat, so the pathways of consequence are indirect: they operate through water. The site falls toward the wetland to the south, surface drainage follows the natural gully along the eastern boundary to the Eastern Marsh, and the karst limestone beneath provides limited natural attenuation for anything reaching the ground.

Five pathways are assessed. PRJ-EI-01 addresses runoff and sediment transport during construction. PRJ-EI-04 addresses the permanent change to the drainage regime arising from hard surfacing. PRJ-EI-09 addresses reclaimed water quality, aquifer recharge and agricultural reuse, which introduces receptor routes that do not presently exist. PRJ-EI-14 addresses the future of the existing wetland conveyance. PRJ-EI-15 addresses accidental and emergency release. Three of the five rate Critical or Very High before mitigation.

7.2.3.1. PRJ-EI-01 Runoff, Sediment Transport and Water Quality

Table 70 sets out the assessment of this pathway.

Table** 70**: PRJ-EI-01 Runoff, sediment transport and water quality: impact assessment

Field	**Assessment**
Activity	Site clearance, earthworks, excavation, stockpiling, exposed soil surfaces, construction traffic, and stormwater discharge during construction
Potential impact	Mobilization of sediment and contaminants toward the Eastern Marsh via the eastern gully and connected drainage pathways
Risk	Deterioration in wetland water quality and increased sedimentation, with habitat mediated effects on species features
Nature and type	Adverse, direct and indirect, construction phase
Extent	Local, extending to the wider wetland system
Duration	Short-term, with the potential for lasting effect where sedimentation is substantial
Likelihood	4, likely without controls
Magnitude	4, high. The receptor is confirmed Critical Habitat of Very High sensitivity, already carrying pressures from dumping, storm damage and urban drainage inputs
Pre-mitigation significance	**Very High**
Mitigation summary	Erosion and sediment controls installed before significant ground disturbance and confirmed adequate at the Project and wetland interface; stabilization of exposed surfaces; stockpile covering and placement away from drainage pathways; stormwater attenuation; wheel wash and road cleaning; inspection after rainfall; monitoring at the

Field	Assessment
	wetland margin (Section 8.3)
Post-mitigation likelihood	2, unlikely
Post-mitigation magnitude	2 to 3, low to moderate
Residual significance	**Low to Medium**
Significant conversion or degradation	No, with effective controls. Uncontrolled or repeated releases could contribute to degradation
Residual management	Turbidity and suspended solids monitoring at the wetland margin during construction; control structure inspection after each rainfall event exceeding the established trigger; corrective action within 24 hours of any observed sediment release

7.2.3.2. PRJ-EI-04 Hydrological Change

Hydrological change is the pathway by which a facility that does not occupy wetland habitat can nevertheless affect the wetland's ecological character. The site is flat to gently sloping and falls toward the wetland to the south, and surface drainage follows the natural gully along the eastern boundary toward the Eastern Marsh. Converting a predominantly vegetated brushland footprint to buildings, tanks, hardstanding and formal drainage changes the volume, rate and pathway of runoff reaching that receptor. In a karst setting the change also acts on infiltration: rainfall that currently enters the limestone through solution channels is instead collected and discharged at a point.

KBF 1 and KBF 2 are the features engaged, since the wetland's ecological character rests on the hydrological regime that maintains the mangrove, marsh and open water mosaic. That regime is already altered. Blocking of the canal to the sea has reduced saltwater intrusion, the system has become predominantly freshwater, and field verification in August 2026 recorded the sluice gate as apparently inoperable, so the system has reduced tidal flushing and reduced capacity to absorb further hydrological change. The drainage routing was finalized on 9 October 2026 following the AECOM review, and the design described at Section 3.2 collects stormwater through an enclosed gravity network discharging at a single outfall to the natural gully on the southeast side. That design includes no detention or retention pond, no flood retention basin and no stormwater treatment facility, and the hydraulic capacity of the gully and its onward connection to the wetland drainage system are not established on measured data. Stormwater attenuation is owned by the Site Drainage and Hydrological Management Plan, which is required before construction approval and is to size and include a detention or retention facility at design stage. The Erosion, Sediment and Stormwater Management Plan and the Groundwater Protection and Monitoring Plan at Section 8.4.2 cross-refer to that plan rather than carrying the attenuation commitment. The residual rating below assumes attenuation sized for the design storm, outfall energy dissipation, and infiltration retained where the groundwater protection zoning permits. On the design as it currently stands those measures are not provided, so the rating is provisional and is confirmed only once the design incorporates the attenuation. Two consequences follow in the meantime. Peak flow and scour at the outfall increase, which places greater weight on the outfall protection and gully

maintenance measures in the Erosion, Sediment and Stormwater Management Plan. And point discharge in place of diffuse infiltration reduces recharge and concentrates any contaminant pathway in the karst, which places greater weight on the monitoring regime at Section 8.4.2. The conditional Critical Habitat finding at Section 7.5, already recorded as design-dependent on drainage routing and on the wetland water balance, cannot be closed out until the position is resolved.

Table 71 sets out the assessment of this pathway.

Table** 71**: PRJ-EI-04 Hydrological change: impact assessment

Field	Assessment
Activity	Hard surfacing, building and tank footprints, site regrading, and the installation of formal drainage, attenuation and discharge arrangements
Potential impact	Change in the volume, rate, timing and point of entry of surface water reaching the Eastern Marsh, and reduction in local infiltration to the karst aquifer
Risk	Alteration of the water balance sustaining the wetland's hydrological and ecological processes, with consequential effects on salinity, vegetation composition and the habitat mosaic; and localized erosion at a concentrated discharge point
Nature and type	Adverse, indirect, construction and operation
Extent	Local, extending through the eastern gully into the wider wetland system
Duration	Permanent, for the operational life of the facility
Likelihood	3, possible. A measurable hydrological change is avoidable through design, but is the default outcome where drainage is designed for site conveyance alone
Magnitude	4, high without design control. The receptor is confirmed Critical Habitat whose ecological character depends on the hydrological regime, and which already carries a reduced flushing capacity
Pre-mitigation significance	High
Mitigation summary	Site drainage designed to maintain pre-development runoff volume, rate and pathway to the Eastern Marsh, with attenuation sized for the design storm and outfall energy dissipation at the discharge point; infiltration retained where the groundwater protection zoning permits; demonstration, before construction approval, that operation will not materially alter wetland hydrology, water quality, salinity or ecological functioning, as required by the Critical Habitat Mitigation, Monitoring and Follow-up Action Matrix; the eastern gully retained as an open, maintained pathway rather than culverted or diverted; drainage design reviewed against the Critical Habitat framework before implementation (Section 8.3)
Post-mitigation likelihood	2, unlikely once the drainage design is confirmed against the pre-development regime
Post-mitigation magnitude	2 to 3, low to moderate
Residual significance	Low to Medium, subject to design confirmation

Field	Assessment
Significant conversion or degradation	No, provided the drainage design demonstrably maintains the pre-development hydrological regime. A design that materially alters flow to the Eastern Marsh would engage the degradation test
Residual management	Drainage design confirmation retained as a pre-construction condition and its verification recorded; flow and water level monitored at the eastern gully outfall through construction and the first two years of operation; wetland margin water quality monitored under the Project monitoring program; any measured departure from the design regime treated as a corrective action under Section 8.5.4

7.2.3.3. PRJ-EI-09 Reclaimed Water Quality, Aquifer Recharge and Agricultural Reuse

PRJ-EI-09 is the pathway that distinguishes this facility from any other component of the Project, and it carries the highest operational exposure. Two receptor routes are created that do not presently exist: aquifer recharge introduces a pathway from reclaimed water to the island's principal freshwater source, and agricultural irrigation introduces a pathway to the food chain. Both act in a karst setting in which rainfall and anything it carries infiltrate rapidly through solution channels with limited residence time and correspondingly limited natural attenuation.

Three conditions qualify the assessment. No groundwater quality baseline exists for the site, so there is at present no reference against which a change attributable to recharge could be demonstrated. No confirmed national standard governing reclaimed water quality for aquifer recharge and agricultural reuse has been identified, and the World Health Organization guidance on the safe use of wastewater in agriculture is applied as the interim reference. And the influent to this facility is the effluent of the adjacent treatment plant, which on the April 2026 sampling is not achieving its design removals, so reclaimed water quality is contingent on completion of the upgrade assessed at STP-EI-05 of the plant chapter. The recharge points and the agricultural offtake arrangements are not yet fixed, so the pathway is assessed by mechanism and not by location.

Table 72 sets out the assessment of this pathway.

Table** 72**: PRJ-EI-09 Reclaimed water quality, aquifer recharge and agricultural reuse: impact assessment

Field	Assessment
Activity	Production of reclaimed water; conveyance to recharge and irrigation points; aquifer recharge; agricultural offtake and irrigation application
Potential impact	Introduction of pathogens, nutrients, metals, disinfection by-products and trace organic contaminants to the karst aquifer and to irrigated agricultural land and produce
Risk	Contamination of the island's principal freshwater source, with limited natural attenuation and limited prospect of remediation; gastrointestinal and other illness among consumers of irrigated produce and among agricultural workers; loss of confidence in the reuse program
Nature and type	Adverse, direct and indirect, operation phase
Extent	Regional to national. The aquifer is the island's principal freshwater source and the

Field	Assessment
	pathway is not confined to the Area of Influence
Duration	Long-term to permanent. Aquifer contamination in karst limestone is persistent and difficult to reverse
Likelihood	3, possible. The process is designed to produce water fit for the intended use, but the standard is unconfirmed, the influent quality is contingent, and no baseline exists against which to detect a departure
Magnitude	5, catastrophic in the event of sustained off-specification recharge, given the receptor and the irreversibility of karst aquifer contamination
Pre-mitigation significance	Very High
Mitigation summary	Confirm the applicable national standard for reclaimed water quality for aquifer recharge and for agricultural reuse with the Environmental Protection Department and the Barbados Water Authority before commissioning, applying WHO guidance on the safe use of wastewater in agriculture as the interim reference; establish the groundwater quality baseline before recharge commences, at the recharge locations and at down-gradient abstraction points; verify the groundwater protection zoning applicable to each recharge point and the conditions attaching to it; multi-barrier treatment with online monitoring of surrogate parameters and automatic diversion to a non-potable holding or return route on any off-specification result, so that recharge cannot proceed on unverified water; monitoring points at the facility outlet and at every point of use; confirmation that the upgraded plant delivers the design influent standard before reuse begins; a defined contingency arrangement where reclaimed water does not meet specification; agreement with identified agricultural users on permitted crops, application methods and worker protection (Section 8.3, Section 8.5.2)
Post-mitigation likelihood	2, unlikely with automatic diversion, online monitoring and a confirmed standard in place
Post-mitigation magnitude	4, high. The consequence of a failure is not reduced by the controls; only its likelihood is
Residual significance	Medium
Significant conversion or degradation	No under designed and managed operation. Sustained off-specification recharge affecting groundwater feeding the wetland system is a credible degradation scenario for KBF 1 and KBF 2
Residual management	Continuous online monitoring at the facility outlet with automatic diversion on exceedance; groundwater quality monitored quarterly at the recharge points and at down-gradient abstraction points against the pre-recharge baseline; reclaimed water quality verified at every point of use before each irrigation season; any exceedance notified to the Environmental Protection Department and the Barbados Water Authority within 24 hours and reuse suspended until the cause is identified and corrected; annual public reporting of reclaimed water quality performance

7.2.3.4. PRJ-EI-14 Alteration of the Existing Wetland Conveyance

This pathway is the same pathway assessed at STP-EI-11 of the plant upgrade chapter, and it is recorded here because the reclamation facility is the reason the conveyance may become redundant. The facility changes the disposition of the treated stream: treated water is expected to be directed to the facility for reuse in place of conveyance through the existing infrastructure to the coastal outlet. The existing conveyance runs southward through the Southern Wetland Interface toward Sandy Beach, with two pumping stations recorded at field verification station FV-06, and that infrastructure sits inside the Core Critical Habitat Area.

Retention as redundancy, decommissioning in place and removal each carry different assessments, and removal would constitute works within Critical Habitat requiring review under the Critical Habitat framework before implementation. The rating below is assessed on the removal case as the option carrying the highest exposure. Because the decision is a single decision affecting both components, it is taken once and recorded once, and the assessments at PRJ-EI-14 here and STP-EI-11 in the plant chapter are read together rather than as separate determinations. The institutional arrangements that will apply once the treated stream is transferred were confirmed by the Barbados Water Authority on 16 October 2026: the new forcemain from the plant to the Needham's Point marine outfall will be owned and operated by the Barbados Water Authority; the canal through which the existing conveyance runs will be maintained by the Ministry of Health, assisted by the Ministry of Transport and Works; the wetland will be managed by the National Heritage Unit of the Ministry of Environment; and operation of the sluice gate remains with the Drainage Unit of the Ministry of Transport and Works. The decision on retention, decommissioning or removal of the conveyance therefore rests with four institutions, and the Critical Habitat review of the selected option is to be undertaken with each of them.

Table 73 sets out the assessment of this pathway.

Table** 73**: PRJ-EI-14 Alteration of the existing wetland conveyance: impact assessment

Field	Assessment
Activity	Retention, decommissioning in place, or removal of the existing outflow conveyance and the two pumping stations at station FV-06, consequent on the transfer of the treated stream to this facility
Potential impact	Physical disturbance to wetland substrate, vegetation and hydrology during works; or, on retention, persistence of a discharge pathway into Critical Habitat that must remain maintained and monitored
Risk	Disturbance to the hydrological and ecological processes supporting Graeme Hall, sediment mobilization within the wetland, disturbance to nesting, roosting and foraging birds, and alteration of the connection between the wetland and the coast
Nature and type	Adverse, direct and indirect, construction phase; or a retained operational pathway
Extent	Local, within the Core Critical Habitat Area, extending to the coastal connection
Duration	Temporary for the works, permanent in respect of the configuration change
Likelihood	3, possible. The works are not committed and the option selected determines whether the pathway is activated
Magnitude	4, high. Works inside confirmed Critical Habitat acting on KBF 1, KBF 2 and KBF 5, in a

Field	Assessment
	system with reduced tidal flushing
Pre-mitigation significance	High
Mitigation summary	Supported by a method statement covering access, plant, working season, sediment control and reinstatement; avoid works during migratory and breeding periods identified for KBF 3; prohibit access outside a demarcated corridor; ecological supervision throughout; demonstrate that the change will not materially alter wetland hydrology, water quality, salinity or ecological functioning (Section 8.3)
Post-mitigation likelihood	2, unlikely that works proceed without the Critical Habitat review and controls in place
Post-mitigation magnitude	3, moderate
Residual significance	Medium
Significant conversion or degradation	No, the rapid Critical Habitat review was completed before implementation and works proceed under a supervised method statement. Unreviewed works within the Southern Wetland Interface would constitute a credible degradation scenario
Residual management	Configuration decision recorded once and notified to the Project Execution Unit and the Environmental Protection Department before works; ecological supervision records retained; turbidity monitoring at the works interface and downstream; reinstatement verified at completion and at six months

7.2.3.5. PRJ-EI-15 Accidental and Emergency Release

Table 74 sets out the assessment of this pathway.

Table** 74**: PRJ-EI-15 Accidental and emergency release: impact assessment

Field	Assessment
Activity	Chemical and fuel storage, handling and refueling during construction and operation; process water containment; plant failure or overflow
Potential impact	Uncontrolled release of chemicals, fuel or process water reaching the wetland or connected drainage pathways
Risk	Contamination of Critical Habitat, with effects on hydrology, water quality and species features
Nature and type	Adverse, direct and indirect, all phases
Extent	Local, extending to the wetland system and the coastal connection
Duration	Temporary for a contained event, long-term for a substantial release

Field	Assessment
Likelihood	2 to 3, unlikely to possible with controls
Magnitude	5, catastrophic for a major uncontrolled release affecting Critical Habitat
Pre-mitigation significance	**High to Very High**
Mitigation summary	Storage and refueling located away from wetland margins and connected drainage; secondary containment; spill response equipment on site; response arrangements explicitly recognizing Graeme Hall as Critical Habitat and providing for immediate containment and notification; engineering confirmation of emergency containment, overflow and backup arrangements before operation
Post-mitigation likelihood	2, unlikely
Post-mitigation magnitude	4, high
Residual significance	**Medium**
Significant conversion or degradation	No; under normal operations. A substantial uncontrolled release is a credible significant degradation scenario
Residual management	Weekly containment inspection; annual response exercise; notification within four hours to the Project Execution Unit, the Environmental Protection Department and the Coastal Zone Management Unit, and within twelve hours to potentially affected residents

7.2.4. Impact Assessment: Terrestrial Habitat and Fauna

Two pathways act on terrestrial habitat and fauna, and they differ in kind. PRJ-EI-02 is a direct and permanent loss within the construction footprint, of a magnitude limited by the fact that the habitat lies outside the Ramsar boundary and is not wetland habitat, though it includes conservation priority flora confirmed at station FV-01. PRJ-EI-03 is behavioral disturbance extending beyond the footprint into habitat that the Project does not occupy, acting on the migratory, congregatory and range-restricted bird assemblages that underlie Key Biodiversity Features 3 and 4.

The distinction matters for management. Habitat loss is controlled by fixing and enforcing the footprint, and once the clearance has occurred no further control is available. Disturbance is controlled continuously, through lighting design, working hours, seasonal restriction and access discipline, and remains manageable throughout construction and operation.

7.2.4.1. PRJ-EI-02 Vegetation Clearance and Habitat Los

Demarcation is the control on which this pathway depends in practice. The clearing boundary is set out on the ground and verified before any vegetation is removed, and the supervisor responsible for the crew is accountable for the crew remaining within it. A clearing claim arising in the week preceding 9 October 2026 concerned an area outside the identified project area, which establishes that the consequence of

weak demarcation is not confined to habitat loss and extends to the relationship with adjoining landowners. Clearance outside the approved extent is an action-level result under the monitoring provisions, and it stops clearing in the contributing area until the boundary is re-established and the departure recorded as a non-conformance.

Table 75 sets out the assessment of this pathway.

Table** 75**: PRJ-EI-02 Vegetation clearance and habitat loss: impact assessment

Field	Assessment
Activity	Site clearance and vegetation removal within the construction footprint
Potential impact	Loss of brushland and shrubbery habitat assessed as Good condition, and loss of individual mature trees including conservation priority species
Risk	Reduction in local habitat availability for range-restricted resident birds, and loss of lignum-vitae individuals
Nature and type	Adverse, direct, permanent within the footprint
Extent	On-site
Duration	Permanent
Likelihood	5, certain within the approved footprint
Magnitude	2 to 3, low to moderate. The habitat is outside the Ramsar boundary and is not wetland habitat, and the affected area is limited to the footprint
Pre-mitigation significance	**High to Very High**
Mitigation summary	Confirm and demarcate the final footprint; identify conservation priority vegetation before clearance, including the lignum-vitae confirmed at station FV-01; avoid where practicable and determine management before removal where avoidance is not feasible; prohibit clearance outside the approved extent (Section 8.3)
Post-mitigation likelihood	5, certain within the reduced footprint
Post-mitigation magnitude	2, low
Residual significance	**High**
Significant conversion or degradation	No, provided there is no encroachment into wetland habitat and conservation priority flora is managed
Residual management	Clearance area recorded against the approved extent; conservation priority vegetation register maintained; monthly verification

7.2.4.2. PRJ-EI-03 Disturbance from Noise, Lighting and Human Presence

Disturbance acts on KBF 3, the migratory and congregatory wetland birds, and KBF 4, the endemic and range-restricted resident birds, through three mechanisms that are separable in management even though they combine at the receptor. Noise and vibration displace foraging and roosting birds from habitat adjacent to the works. Artificial lighting at night disrupts orientation, roosting and foraging behavior and extends the effective footprint of the site into habitat that is otherwise undisturbed. Human presence, including access outside approved areas, produces flushing and nest abandonment during breeding.

The features at risk are specific. The Egret Island feature within the Nature Sanctuary is the focus of the nesting and roosting assemblage that underlies the Criterion E determination[113], and Little Egret is rated Very High under that criterion on historical evidence of an important breeding colony. Barbados Bullfinch, a Barbados endemic, was confirmed in the Project environs in April 2026. Barbados lies on the Atlantic flyway and the swamp is among the few remaining wetland stopover sites on the island, so migratory passage concentrates use in defined periods. The construction methodology and the lighting design are not yet available, and the rating is assessed at a screening level and revisited when they are.

Table 76 sets out the assessment of this pathway.

Table** 76**: PRJ-EI-03 Disturbance from noise, lighting and human presence: impact assessment

Field	Assessment
Activity	Construction plant and vehicle operation, piling and breaking, site lighting during construction and operational security and safety lighting, and personnel presence and movement at the wetland-facing boundary
Potential impact	Displacement of birds from habitat adjacent to the site; disruption of roosting, foraging and orientation behavior through light spill; flushing and nest abandonment during the breeding period
Risk	Reduced use of habitat supporting KBF 3 and KBF 4, including the nesting and roosting assemblage associated with the Egret Island feature and the range-restricted resident assemblage confirmed in the Project environs
Nature and type	Adverse, direct and indirect, construction and operation
Extent	Local, extending into the wetland margin beyond the site boundary
Duration	Short-term for construction disturbance; long-term for operational lighting
Likelihood	4, likely without controls. Lighting and noise from an operating facility at the wetland margin reach adjacent habitat by default
Magnitude	3, moderate. Behavioral displacement rather than habitat loss, recoverable on cessation, but acting on features underpinning the Critical Habitat determination and on an assemblage with few alternative sites on the island
Pre-mitigation significance	High
Mitigation summary	Low-spill lighting design at the wetland interface, directed away from wetland habitat,

[113] Criterion E - Migratory Species/Routes or Congregations

Field	Assessment
	using the minimum illumination required for safety and security, warm spectrum, shielded and on timers or motion activation where security permits; activities confined to approved areas and hours, with targeted temporary restrictions where sensitive fauna activity is identified; a demarcated boundary at the wetland interface with access prohibited beyond it; scheduling of the highest-noise activities outside the migratory passage and breeding periods identified for KBF 3; ecological watching brief during clearance and during works at the wetland-facing boundary; noise controls under PRJ-EI-06 applied to the habitat receptor as well as the community receptor
Post-mitigation likelihood	3, possible. Some disturbance is inherent to constructing and operating a facility at the wetland margin
Post-mitigation magnitude	2, low
Residual significance	Medium
Significant conversion or degradation	No. Behavioral disturbance at this scale and duration does not materially reduce the integrity or biodiversity support function of the Critical Habitat, provided lighting and access controls hold
Residual management	Lighting verified against the design at commissioning and re-verified annually, including a night-time spill check at the wetland boundary; boundary demarcation inspected monthly; ecological watching brief records retained and reviewed; any identified sensitive fauna activity triggers a temporary restriction recorded in the works program; incidents of access beyond the demarcated boundary investigated and reported

7.2.5. Impact Assessment: Air, Noise and Community Amenity

These three pathways act on the same community receptors, principally the residential area approximately 250 meters to the southeast and the two schools in the vicinity, and on the wetland margin. All three are assessed against measured April 2026 baselines, and in the case of noise that baseline already sits at or above the applicable guideline value, so the Project increment is an addition to an existing exceedance rather than the creation of a new one.

Their combined effect is assessed separately at PRJ-SI-06, because residents experience dust, noise, traffic and visual change together and continuously rather than as separable exposures, and the cumulative effect on quality of life is greater than any of them alone.

7.2.5.1. PRJ-EI-05 Air Quality and Dust

Air quality and dust are assessed against the residential and school receptors and against the wetland margin, which is a receptor in its own right because deposition on vegetation and water surfaces affects the habitat rather than only amenity. April 2026 baseline monitoring recorded 24.64 µg/m^3 $PM_{2·5}$ and 59.61 µg/m^3 PM_{10} over twelve hours at Location 1, within the boundary of this facility, against World Health Organization 24-hour guidelines of 15 and 45 µg/m^3; the twelve-hour averaging period is not directly comparable to the 24-hour guideline and the result is treated as indicative. Upwind Locations 4 and 5 were within guideline values for particulates. Saharan dust between June and August raises

particulate concentrations independently of Project activity and compounds construction dust in that period.

Table 77 sets out the assessment of this pathway.

Table** 77**: PRJ-EI-05 Air quality and dust: impact assessment

Field	Assessment
Activity	Site clearance, earthworks and excavation, material handling and stockpiling, concrete and masonry works, cutting and grinding, and vehicle movements on unpaved surfaces
Potential impact	Elevated particulate concentrations and deposited dust at residential and school receptors and on wetland vegetation and water surfaces at the eastern margin
Risk	Respiratory irritation and aggravation of pre-existing respiratory and cardiovascular conditions; soiling and amenity loss; reduced photosynthetic function and altered water surface condition at the wetland margin
Nature and type	Adverse, direct, construction phase
Extent	Local, within approximately 500 meters of the site boundary
Duration	Short-term and intermittent, concentrated in the clearance and earthworks stages and compounded in the June to August Saharan dust period
Likelihood	4, likely without controls. A cleared and worked footprint in a dry tropical climate generates dust as a matter of course
Magnitude	3, moderate. Measurable change requiring management and recoverable, acting on a receptor population in which 25.8 percent are aged 65 and over, on two schools in the vicinity, and on a wetland margin already under stress
Pre-mitigation significance	High
Mitigation summary	Water suppression at clearance, earthworks and haul routes, intensified during the June to August Saharan dust period; covered stockpiles sited away from the eastern boundary and from the drainage pathway; covered loads; wheel wash at the site exit and daily road cleaning; shade cloth and screening at the boundary, extending the measure already observed in use during field verification; progressive stabilization of exposed surfaces; sequencing of high-dust operations with reference to wind direction; continuous particulate monitoring at community and school receptors; a work stop trigger on visible dust migration beyond the boundary (Section 8.3, Section 8.5.4)
Post-mitigation likelihood	2, unlikely
Post-mitigation magnitude	2, low
Residual significance	Low
Residual management	Continuous particulate monitoring at community and school receptors reported monthly against the adopted guideline; work stoppage on visible dust migration beyond the boundary toward a residential, school or wetland receptor; dust complaints logged

Field	Assessment
	and closed within seven days; visual inspection of the wetland margin for deposition monthly and after any high-dust operation; monitoring at the boundary coordinated with the plant upgrade so that shared receptors are measured once and reported against both components

7.2.5.2. PRJ-EI-06 Noise and Vibration

Noise is assessed against the measured ambient baseline. Monitoring on 15 to 17 April 2026 recorded Location 1, within the boundary of this facility, at daytime averages between 51.7 and 58.6 dB(A), and the nearest residential cluster at Location 3 between 56.3 and 60.5 dB(A). The World Health Organization Community Noise Guidelines, adopted under the National Noise Policy, identify 55 dB(A) as the daytime threshold for serious annoyance in outdoor living areas. Ambient conditions at the residential receptor therefore sit at or above the guideline value before any Project activity commences, and construction noise is an increment upon an existing exceedance rather than the creation of a new one.

Two qualifications apply. The HSE Management Manual records construction noise limits of 85 dB(A) LAeq(8h) during normal hours and 65 dB(A) LAeq(4h) during restricted hours; these are occupational limits governing worker exposure and are distinct from the community guideline values applied here, and the two should not be cited interchangeably. And receptor exposure is a combined Project exposure: camp construction and operation, SCSTP upgrade activities, this facility's construction and the existing plant all contribute to the same acoustic environment, so coordinated scheduling of high-noise activities is required where simultaneous works would raise receptor levels.

Table 78 sets out the assessment of this pathway.

Table** 78**: PRJ-EI-06 Noise and vibration: impact assessment

Field	Assessment
Activity	Site clearance, earthworks and excavation, piling and breaking, concrete works, plant and generator operation, mechanical and electrical installation, and heavy vehicle movements; and in operation, pumps, blowers and standby generation
Potential impact	Elevated noise and vibration at residential and school receptors, and disturbance at the wetland margin, incremental to an ambient condition already at or above the guideline value
Risk	Serious annoyance, interference with teaching at the two schools in the vicinity, sleep disturbance where works extend beyond daytime hours, structural or cosmetic damage from vibration, and behavioral disturbance to fauna assessed at PRJ-EI-03
Nature and type	Adverse, direct, construction phase, with a lower-level operational component
Extent	Local, within approximately 500 meters of the site boundary
Duration	Short-term and intermittent for construction; long-term at low level for operation
Likelihood	4, likely. The baseline sits at or above the guideline value, so any material increment produces an exceedance

Field	Assessment
Magnitude	3, moderate. Measurable and requiring management, recoverable on completion, acting on a population in which 41.1 percent are aged 55 and over and 373 residents are recorded as retired and present during the working day
Pre-mitigation significance	High
Mitigation summary	Noise Management Plan setting working hours, restricted-hour limits and permitted high-noise activities; low-noise plant selection and acoustic screening at the boundaries facing the residential receptor, the schools and the wetland; the highest-noise activities scheduled outside school hours and outside the restricted evening period; coordinated scheduling with the SCSTP upgrade and the camp so that simultaneous high-noise activity at shared receptors is avoided; pre-condition survey of structures within the vibration influence zone and vibration monitoring during breaking and piling; advance notification of high-noise works; operational plant enclosed or attenuated at design; boundary monitoring against the WHO Community Noise guideline values (Section 8.3, Section 8.5.2)
Post-mitigation likelihood	3, possible. The ambient exceedance limits the extent to which the increment can be reduced below the guideline
Post-mitigation magnitude	2, low
Residual significance	Medium
Residual management	Noise monitored monthly and on complaint at residential and school boundaries against the WHO Community Noise Guideline values, with results reported against this facility and the plant upgrade jointly; noise complaints logged and closed within seven days; quarterly review of the works program with the two school administrations; sustained Project-attributable exceedance triggers rescheduling or a method change under the corrective action process at Section 8.5.4

7.2.5.3. PRJ-EI-11 Odor and Bioaerosols

The odor profile of this facility differs from that of the plant upgrade because the process handles treated effluent rather than raw sewage. Hydrogen sulfide generation, which is the dominant odor mechanism at the treatment works, requires the anaerobic conditions associated with raw and partially treated wastewater and is correspondingly reduced in a reclamation process receiving a treated stream. Three residual sources remain: sludge and residuals handling assessed at PRJ-EI-10, chemical dosing, and any storage or balancing stage in which treated water is held long enough for conditions to become anaerobic. Bioaerosols arise wherever the process aerates, sprays or agitates water containing residual organisms.

The process design is not yet available. The rating below is assessed at a screening level against the residential receptor at approximately 250 meters and is revisited when the treatment train, the storage arrangements and the dosing regime are fixed. April 2026 baseline sampling recorded hydrogen sulfide at 0.018 to 0.04 ppm across the three monitored locations, well below the NIOSH recommended exposure limit of 10 ppm, which establishes the pre-construction reference point.

Table 79 sets out the assessment of this pathway.

Table** 79**: PRJ-EI-11 Odor and bioaerosols: impact assessment

Field	Assessment
Activity	Reclamation process operation including any aeration, filtration, storage and balancing stages; chemical dosing, storage and delivery; sludge and residuals handling; and process upset or extended retention
Potential impact	Release of odor compounds, chemical vapors and biological aerosols at concentrations reaching the residential receptor at approximately 250 meters and the workers' camp
Risk	Amenity loss, anxiety, headache, nausea and respiratory irritation; and, in the case of a chemical release, acute exposure at the site boundary
Nature and type	Adverse, direct, operation phase
Extent	Local, within approximately 500 meters of the site boundary
Duration	Long-term and intermittent through operation
Likelihood	3, possible. The treated influent reduces the dominant odor mechanism, but storage, dosing and residuals handling retain a credible source
Magnitude	2, low. Transient and localized amenity effect, recoverable, acting nonetheless on a population in which more than one resident in four is aged 65 or over
Pre-mitigation significance	Medium
Mitigation summary	Odor sources identified at detailed design and enclosed, covered or vented to treatment where the process configuration allows; storage and balancing sized and operated to avoid retention periods that permit anaerobic conditions; chemical storage and dosing enclosed with vapor control and sited away from the boundary facing the residential receptor; sludge and residuals handling controls under PRJ-EI-10; hydrogen sulfide monitoring at the boundary integrated with the plant upgrade monitoring so that a single boundary record covers both facilities; advance notification of any planned operation expected to generate odor; complaint-triggered investigation with the causal activity identified and corrected (Section 8.3, Section 8.5.2)
Post-mitigation likelihood	2, unlikely
Post-mitigation magnitude	2, low
Residual significance	Low
Residual management	Hydrogen sulfide monitored at the site boundary and the nearest community receptor, reported monthly and read jointly with the plant upgrade record so that a complaint can be attributed to the correct facility; odor complaints logged with response within 24 hours and closed within seven days; the odor assessment revisited and this rating confirmed once the process design is fixed, before commissioning

7.2.6. Impact Assessment: Traffic and Road Safety

Traffic and road safety carries the highest pre-mitigation rating of any environmental pathway in this assessment, and it is the pathway on which mitigation acts least favorably: controls reduce the likelihood of a collision but cannot reduce the severity of a heavy vehicle striking a pedestrian. That structure is why the residual magnitude remains high after mitigation, with a residual rating of Medium, and why management concentrates entirely on prevention.

The pathway is assessed once for the shared access route rather than separately for each component, because combined construction traffic, deliveries, sludge and waste haulage and workforce movement compound through frequency on a single narrow residential road. A single integrated movement plan applies across the reclamation facility, the plant upgrade and the workers' camp.

7.2.6.1. PRJ-EI-07 Traffic and Road Safety

Table 80 sets out the assessment of this pathway.

Table** 80**: PRJ-EI-07 Traffic and road safety: impact assessment

Field	Assessment
Activity	Heavy vehicles, deliveries, plant movements and commuter traffic transiting a narrow shared residential access road
Potential impact	Collision with pedestrians, cyclists or vehicles; degradation of the road surface and sub-base
Risk	Pedestrian strike, particularly of schoolchildren and accompanying caregivers; serious injury or fatality
Nature and type	Adverse, direct, construction phase
Extent	Local
Duration	Short-term, continuous through construction
Likelihood	4, likely
Magnitude	5, catastrophic. Fatality is a credible outcome of a pedestrian strike by a heavy vehicle
Pre-mitigation significance	**Critical**
Mitigation summary	Prohibition of heavy vehicle community transit between 07:00 and 08:00 and between 15:00 and 16:30; speed limit of 15 kilometers per hour on the community access route and 10 kilometers per hour at site entrances; trained traffic wardens at critical bends and access points; off-site vehicle staging with no queuing on public roads; route planning avoiding school frontages and heavily populated areas; load optimization to reduce trip numbers; driver induction and refresher training; vehicle movement log; daily road condition inspection and prompt removal of mud and spillage; school engagement (Section 8.3)
Post-mitigation likelihood	2, unlikely

Field	Assessment
Post-mitigation magnitude	4, high
Residual significance	**Medium**
Residual management	Consequence severity cannot be reduced below serious injury, so management concentrates on likelihood. Weekly compliance audit of transit windows and speeds; immediate driver suspension and investigation within 24 hours of any pedestrian near miss; quarterly review with school administrations

7.2.7. Impact Assessment: Waste, Materials and Emissions

This group covers the material and emissions streams the facility generates and the pathways by which they reach receptors. Two considerations run through all four assessments. The site drains toward confirmed Critical Habitat through the eastern gully, so material escaping the site follows a short and direct route to a sensitive receptor. And illegal dumping is an existing pressure recorded at the Eastern Marsh, so waste discipline here carries weight beyond the site boundary.

PRJ-EI-08 addresses waste, spoil and hazardous materials. PRJ-EI-10 addresses sludge and residuals from the reclamation process, which differ from sewage sludge in being less putrescible but potentially chemically dominated, with consequences for the disposal route. PRJ-EI-12 addresses energy demand and greenhouse gas emissions against the Contract non-carbon commitment. PRJ-EI-13 addresses the chance find of cultural heritage, which Performance Standard 8 engages wherever excavation is proposed.

7.2.7.1. PRJ-EI-08 Waste, Spoil and Hazardous Materials

The Barbados waste framework applies. Barbadian law categorizes waste as refuse, rubbish and swill, and the operative categories for this facility are municipal solid waste, recyclable waste, organic and green waste, construction and demolition waste, special care and hazardous waste, and bulk and white waste. Unlike the plant upgrade, this facility generates no demolition stream, and its arisings are dominated by clearance vegetation, excavated spoil, packaging and general construction waste, together with fuels, oils and chemicals in storage.

Waste discipline on this site carries weight beyond the site boundary for two reasons. Illegal dumping including household material and appliances is an existing pressure recorded at the Eastern Marsh during field verification, so the wetland margin is already a place where material accumulates. And the site drains toward that margin through the eastern gully, so waste or leachate escaping the site follows a short and direct pathway to Critical Habitat.

Table 81 sets out the assessment of this pathway.

Table** 81**: PRJ-EI-08 Waste, spoil and hazardous materials: impact assessment

Field	Assessment
Activity	Generation, segregation, storage, transport and disposal of clearance vegetation, excavated spoil, packaging, general construction waste, and hazardous materials

Field	Assessment
	including fuels, oils, solvents and batteries
Potential impact	Uncontrolled disposal, windblown litter, leachate from stored waste, and release of hazardous material to ground or to the eastern gully drainage pathway
Risk	Contamination of the karst aquifer, which provides limited natural attenuation, and of the Eastern Marsh; reinforcement of the existing dumping pressure at the wetland margin; loss of landfill capacity
Nature and type	Adverse, direct and indirect, construction phase
Extent	Local, extending to the disposal site and to the wetland via the eastern gully
Duration	Short-term, concentrated in the clearance and construction stages, with the potential for lasting effect where hazardous material is released
Likelihood	3, possible. Arisings are certain; escape from a managed system is a matter of discipline
Magnitude	3, moderate. Measurable and requiring management, recoverable, with the short drainage pathway to the Eastern Marsh raising the consequence of any escape
Pre-mitigation significance	Medium
Mitigation summary	Segregation at source with labeled and covered skips and a defined collection frequency; storage areas sited away from the eastern boundary and from the drainage pathway; impermeable bunded storage for fuels, oils and chemicals with secondary containment and spill response equipment; a spoil balance identifying reuse on site and the destination of surplus; green waste routed to composting or approved organic disposal rather than to landfill where practicable; transport by an authorized contractor to a government-approved disposal site with waste transfer documentation for every load; prohibition of on-site burning and of any disposal outside the approved route; perimeter inspection for windblown material (Section 8.3)
Post-mitigation likelihood	2, unlikely
Post-mitigation magnitude	2, low
Residual significance	Low
Significant conversion or degradation	No. Managed waste arisings do not act on a Key Biodiversity Feature at a scale capable of degradation; an uncontrolled hazardous release is assessed at PRJ-EI-15
Residual management	Waste transfer records reconciled monthly against arisings with any unaccounted stream investigated within seven days; hazardous material storage and bunding inspected weekly and after rainfall; site perimeter and the eastern gully inspected weekly for windblown material and for evidence of dumping; the spoil balance updated and reported quarterly

7.2.7.2. PRJ-EI-10 Sludge and Residuals

Sludge and residuals from the reclamation process comprise filter backwash solids, membrane or media cleaning residues, spent chemical and any biosolids generated by the process, and their quantity and character depend on the treatment train, which is not yet fixed. Two features distinguish this stream from the sludge assessed at the plant upgrade. It is smaller and less putrescible, since the influent is a treated stream. And it may carry concentrated chemical residues from cleaning and dosing operations, which raises a disposal question that the plant's biosolids do not: a residual stream that is chemically rather than biologically dominated may not be acceptable at the disposal route used for sewage sludge.

The assessment below is at a screening level and is revisited when the process design is available and the residual characterization is complete. Where the process generates a stream requiring specialist handling or disposal, that requirement is identified at detailed design and not at commissioning.

The design provision to receive dewatered sludge from the Bridgetown Sewage Treatment Plant for drying at this site bears on this pathway and is assessed on the following basis. Receipt of that material would increase the throughput of the solar drying beds and the quantity of dried solids leaving the site, which raises handling, odor and vector exposure at the drying area and increases the number of haulage movements on the shared residential access route. It introduces no new impact mechanism, because the material is of the same character as the sludge produced on site and passes through the same unit process. Three controls govern it. The quantity received is held within the design capacity of the drying facility, and receipt is suspended where that capacity is reached. Deliveries are scheduled within the transit windows set by the Traffic and Pedestrian Management Plan, so that the movements count against the same limits that apply to Project haulage and against the same school-sensitive restrictions. And the odor and vector monitoring at the drying area treats combined throughput as the design case. The provision extends to dewatered sludge only, and no arrangement exists for sewage to be brought to this site by road from any other plant or catchment.

Table 82 sets out the assessment of this pathway.

Table** 82**: PRJ-EI-10 Sludge and residuals: impact assessment

Field	Assessment
Activity	Generation, handling, storage, transport and disposal of filter backwash solids, cleaning residues, spent chemicals and process biosolids
Potential impact	Leachate and spillage during handling and storage; disposal of a chemically dominated residual at a route not authorized to receive it; odor and vector attraction from any putrescible fraction
Risk	Contamination of the karst aquifer and of the eastern gully drainage pathway; regulatory non-compliance at the disposal point; amenity effects at the residential receptor
Nature and type	Adverse, direct and indirect, operation phase
Extent	Local, extending along the haulage route to the disposal site
Duration	Long-term and recurrent through operation
Likelihood	3, possible. Arisings are certain; the risk lies in characterization and disposal routing

Field	Assessment
	that has not yet been established
Magnitude	2, low. Volumes are modest and the stream is less putrescible than sewage sludge, though chemical residues raise the disposal consequence
Pre-mitigation significance	Medium
Mitigation summary	Characterize the residual streams at detailed design, including chemical composition, and confirm an authorized disposal route for each before commissioning; enclosed or covered storage on impermeable bunded areas with leachate capture, sited away from the eastern boundary and the drainage pathway; sealed transport by an authorized contractor with waste transfer documentation for every load; segregation of chemically dominated residues from any biosolids fraction; recovery or reuse assessed where the characterization permits; volumes and disposal routes reported to the Environmental Protection Department (Section 8.3, Section 8.5.2)
Post-mitigation likelihood	2, unlikely
Post-mitigation magnitude	1 to 2, negligible to low
Residual significance	Low
Residual management	Residual characterization repeated annually and after any change to the treatment or dosing regime; quantities and disposal records reconciled monthly with a target of 100 percent to an authorized site; storage and leachate capture inspected weekly and after rainfall; this assessment confirmed against the actual residual profile within the first year of operation

7.2.7.3. PRJ-EI-12 Energy Demand and Greenhouse Gas Emissions

This assessment addresses the emissions inventory. The community health consequence of vehicle exhaust and combustion at the receptor is assessed at PRJ-EI-05 and is a distinct matter. Construction energy demand arises from plant, temporary generation and haulage; operational demand arises from pumping, filtration, disinfection and any membrane process, and advanced reclamation processes are energy intensive relative to conventional treatment. The Contract stipulates a non-carbon emissions agreement, against which the Project's profile must be recorded.

Greenhouse gas parameters were not included in the April 2026 baseline sampling, which is an acknowledged gap in the baseline. Carbon dioxide, methane and other greenhouse gases are to be added to the Project monitoring program, and the operational profile of this facility should be established before commissioning so that the Contract commitment is measurable rather than declaratory. The facility's emissions are also to be read against the water security benefit it delivers, since reduced groundwater abstraction carries its own energy consequence.

Table 83 sets out the assessment of this pathway.

Table** 83**: PRJ-EI-12 Energy demand and greenhouse gas emissions: impact assessment

Field	Assessment
Activity	Construction plant, temporary generation and haulage; and in operation, pumping, filtration, disinfection, dosing and any membrane process, together with standby generation
Potential impact	Increase in energy demand and in direct and indirect greenhouse gas emissions attributable to the Project
Risk	Non-compliance with the Contract non-carbon emissions commitment, and an operational emissions profile carried into service without a baseline against which to measure or manage it
Nature and type	Adverse, direct and indirect, construction and operation; global in effect
Extent	Transboundary and international in effect, with the compliance obligation arising at Project level
Duration	Short-term for construction; long-term for operation
Likelihood	5, highly likely. Operational energy demand follows directly from the reclamation process
Magnitude	2, low. Absolute emissions are small in a global frame and are partly offset by reduced groundwater abstraction and by the treatment improvement at the adjacent plant
Pre-mitigation significance	High
Mitigation summary	Add carbon dioxide, methane and other greenhouse gases to the Project monitoring program and establish the operational emissions baseline before commissioning; energy efficiency in the selection of pumping, aeration, filtration and dosing equipment at detailed design, with specific energy consumption per cubic meter of reclaimed water adopted as a design parameter; renewable generation assessed for the site, including photovoltaic on tank and building surfaces; early permanent power connection to minimize generator running; haulage trip optimization under the integrated movement plan; annual reporting of energy use and emissions against the Contract commitment (Section 8.5.2, Section 8.5.6)
Post-mitigation likelihood	5, highly likely. The demand is inherent to the process and is managed rather than avoided
Post-mitigation magnitude	1 to 2, negligible to low
Residual significance	Medium to High
Residual management	Greenhouse gas parameters added to the monitoring program and reported annually against the Contract non-carbon emissions agreement; specific energy consumption per cubic meter of reclaimed water metered and reported monthly; the net position recorded alongside the water security and treatment benefits, so that the emissions increase is read against the groundwater abstraction avoided and the pollutant load removed

7.2.8. PRJ-EI-13 Chance Find of Cultural Heritage

Excavation is proposed, which engages Performance Standard 8 irrespective of whether cultural heritage sites are identified within the Area of Influence. No cultural heritage receptor has been identified at this footprint, so the pathway is a chance find pathway rather than a known-resource pathway. The site is previously undeveloped land, which distinguishes it from the plant upgrade footprint and marginally raises the possibility of encountering undisturbed material, though no evidence indicates the presence of archaeological deposits. The requirement is procedural and must be discharged before excavation begins.

Table 84 sets out the assessment of this pathway.

Table** 84**: PRJ-EI-13 Chance find of cultural heritage: impact assessment

Field	Assessment
Activity	Site clearance, excavation, trenching, and foundation and pipeline works on previously undeveloped land
Potential impact	Disturbance, damage or loss of previously unrecorded archaeological or cultural heritage material encountered during ground works
Risk	Irreversible loss of heritage value, and non-compliance with Performance Standard 8 and with national heritage requirements
Nature and type	Adverse, direct, construction phase
Extent	On-site
Duration	Permanent where material is damaged or removed without record
Likelihood	2, unlikely. No cultural heritage receptor is identified in the Area of Influence, though the land is previously undeveloped
Magnitude	3, moderate. Any loss would be irreversible for the item concerned
Pre-mitigation significance	Medium
Mitigation summary	Chance Find Procedure prepared and adopted before excavation begins, setting the stop-work trigger, the securing and holding arrangements for any find, the notification route to the relevant national authority through the Project Execution Unit, and the authority under which works may resume; induction of all excavation personnel and machine operators in the recognition and reporting of finds; the procedure incorporated into the permit-to-work system for ground works; the same procedure applied across this facility, the plant upgrade and the camp so that a single route operates on the shared site (Section 8.3)
Post-mitigation likelihood	2, unlikely
Post-mitigation magnitude	1, negligible, with the procedure operating as intended

Field	Assessment
Residual significance	Low
Residual management	Chance Find Procedure maintained and its induction recorded for every person engaged in ground works; any find registered, notified within 24 hours and works in the affected area suspended until written resumption authority is given; the procedure reviewed annually and after any activation

7.2.9. PRJ-EI-16 Vector Breeding

Vector breeding is assessed here as a pathway in its own right, having previously been carried only as a control within the community health assessment. Mosquitoes are the health concern residents adjacent to the swamp raise first, three disease-competent species are present in Graeme Hall Swamp, and the hydrological condition of the wetland has raised breeding potential independently of the Project: the system has become predominantly freshwater following the blocking of the canal to the sea, and the species of public health concern do not breed in brackish water.

Construction on this footprint adds standing water in excavations, trenches, drums, plant and stored materials, on a site that drains toward the wetland and works through the June to November wet season. The natural control provided by larvivorous fish depends on hydrological connectivity, so keeping the eastern gully and the wetland canals clear is a vector control measure as much as a drainage one. The Ministry of Health fish breeding station adjacent to the treatment plant is within the Project environs and its protection is a requirement of this assessment.

Table 85 sets out the assessment of this pathway.

Table** 85**: PRJ-EI-16 Vector breeding: impact assessment

Field	Assessment
Activity	Excavation and trenching, temporary drainage interruption, storage of materials and plant capable of retaining water, and, in operation, any open storage or balancing stage
Potential impact	Creation of mosquito breeding sites on and around the works area, and reduction in the natural control where drainage pathways are impounded
Risk	Increased transmission of dengue, chikungunya, Zika and other vector-borne disease in a community that identifies mosquitoes as its primary health concern, acting on a population in which 25.8 percent of residents are aged 65 and over
Nature and type	Adverse, direct and indirect, construction and operation
Extent	Local, extending across the wetland margin and the surrounding residential area
Duration	Short-term and recurrent during construction, concentrated in the wet season; long-term at low level in operation
Likelihood	4, likely without controls. Standing water accumulates readily on an active works area in a wet tropical climate
Magnitude	3, moderate. Measurable increase in breeding opportunity requiring management and

Field	Assessment
	recoverable, acting on a community already carrying elevated background risk
Pre-mitigation significance	High
Mitigation summary	Weekly inspection of the works area for standing water with elimination within 24 hours of identification, and additional inspection after rainfall; drainage of excavations and covering or inversion of water-retaining plant and materials; maintenance of the eastern gully and temporary drainage so that flow is not impounded; operational storage designed closed or with positive turnover; coordination of works scheduling with Ministry of Health clearing and fogging programs; protection of the fish breeding station from disturbance, runoff and access interference; worker and community awareness on breeding site elimination
Post-mitigation likelihood	2, unlikely
Post-mitigation magnitude	2, low
Residual significance	Low
Significant conversion or degradation	No. The pathway acts on community health rather than on a Key Biodiversity Feature, though impounded drainage would engage the hydrological assessment at PRJ-EI-04
Residual management	Monitoring WM-29, standing water and vector breeding sites inspected weekly and after rainfall with elimination within 24 hours; fish breeding station condition and access inspected monthly; vector-related grievances tracked separately within the grievance register and reviewed monthly with the Ministry of Health; any breeding site not eliminated within 24 hours is a corrective action trigger

7.3. Workers' Camp Environment and Social Assessment

This section applies the Program assessment methodology to the Workers' Camp. It identifies the impact pathways that are specific to the camp, assesses each against the likelihood and magnitude scales, and records the significant conversion or degradation determination where a Key Biodiversity Feature is engaged. Pathways that the camp shares with the SCSTP upgrade and the SCWRRF are not repeated here: they are assessed once in those chapters and are listed in Table 100 with the chapter in which each is assessed.

Social pathways PRJ-SI-01, PRJ-SI-02 and PRJ-SI-03 are assessed once at Project level because the workforce, the accommodation arrangements and the governing social instruments are common to both facilities and the workers' camp. The camp pathways CMP-SI-05 and CMP-SI-07 and CMP-BEN-01 record only the camp-specific rating and measures.

7.3.1. Introduction to the Assessment

Three features distinguish the camp from the two treatment facilities and determine which pathways are assessed here. The camp is the only component that accommodates people: a resident workforce of 120 at peak construction, with up to 83 further personnel by day, so the pathways of greatest consequence arise from the presence and conduct of the workforce as well as from the construction

footprint. The camp occupies about 6,592 m^2 of dry scrub grassland beside an operating sewage treatment plant and Graeme Hall Swamp, and its foul discharge joins the influent to a plant that is currently performing far below its design standard. And the camp has a single access route, an earthen dam of about 730 m shared with the community road serving Harmony Hall, which is also the route for the other components.

Construction activities that the camp shares with the treatment facilities, such as earthworks, concrete washout, plant noise, dust, fuel and chemical storage, waste handling, occupational injury and chance finds, act on the same site, drain to the same receptors and are controlled by the same measures. They are assessed once in the SCSTP and SCWRRF chapters and applied to the camp without variation, as the baseline treats the three as one footprint. The pathways below are those that are strictly unique to the camp or that act through the camp's workforce, accommodation, sewage connection or single access route.

Pathways are prefixed CMP-EI for environmental impacts, CMP-SI for social impacts and CMP-BEN for beneficial outcomes. Each is presented in the standard table. Risk is scored as likelihood multiplied by magnitude on the five by five matrix: 1 to 4 Low, 5 to 9 Medium, 10 to 14 High, 15 to 19 Very High and 20 to 25 Critical. Where a pathway consolidates several source activities, likelihood and magnitude are those of the highest-rated activity, so the rating is conservative.

7.3.2. Impact Pathways Identified

Table 86 presents the Workers' Camp impact pathways identified.

Table** 86**: Workers' Camp impact pathways identified

Ref	Pathway	Phase	Primary receptors
CMP-EI-01	Camp Wastewater and Sewage Discharge	Construction and operation	Graeme Hall Swamp, SCSTP, soil, residents
CMP-EI-02	Habitat Loss and Disturbance to Wildlife	Construction and operation	Terrestrial fauna, resident and migratory birds, native flora
CMP-EI-03	Generator Operation and Camp Noise	Construction and operation	Residents at Harmony Hall, camp workers
CMP-EI-04	Prefabricated Building Erection and Lifting	Construction and operation	Camp workers, access route users
CMP-SI-01	Access, Traffic and Road Safety	Construction and operation	Residents, school children, businesses, emergency services
CMP-SI-02	Dust, Noise and Disruption at Community Receptors	Construction	Residents (high sensitivity at about 250 m), farmland, Ministry of Agriculture

Ref	Pathway	Phase	Primary receptors
CMP-SI-03	Pressure on Services and Utilities	Construction	Harmony Hall and settlements on shared infrastructure, SCSTP
CMP-SI-04	Inflationary Pressure and End-of-Construction Contraction	Construction and demobilization	Low-income households, renters, local suppliers
CMP-SI-05	Labor Influx, Worker-Community Interaction and Community Cohesion	Construction	Community, workers, vulnerable groups
CMP-SI-06	Community Health and Disease Transmission	Construction	Workers, residents
CMP-SI-07	Sexual Exploitation and Abuse, Sexual Harassment and Gender-Based Violence	Construction	Women and girls, minors, women workers
CMP-SI-08	Fair Treatment, Recruitment, Pay and Labor Rights	Construction	Workers, job applicants, young persons
CMP-BEN-01	Employment and Skills	Construction and operation	Residents of the project area of influence

7.3.3. Impact Assessment: Environmental Pathways Unique to the Camp

These four pathways arise from the camp's sewerage connection, its footprint and its habitat setting, its continuous generator operation and its use of prefabricated accommodation. They are the environmental pathways that the treatment facilities do not generate.

CMP-EI-01 Camp Wastewater and Sewage Discharge

This is the camp's principal discharge pathway. The camp's foul flow joins the influent to the SCSTP, which sampling on 16 April 2026 showed to be discharging suspended solids at 142 mg/L against 89 mg/L entering it, with ammonia removal of about 26 percent and disinfection failing. A leak, a treatment-unit failure or a surge in sanitary load at the camp therefore compounds an existing source acting on a wetland that is confirmed Critical Habitat, has lost tidal flushing and already receives urban runoff. The camp is a small load against the plant, which is why the residual rating falls to Low once the treatment unit and the connection operate as designed, but confirmation of the receiving sewer's capacity is outstanding and conditions the rating.

Table 87 sets out the assessment of this pathway.

Table** 87**: CMP-EI-01 Camp Wastewater and Sewage Discharge: impact assessment

Field	Assessment
Activity	Installation and operation of the camp sewerage system and treatment unit; discharge of domestic wastewater from kitchens, showers and toilets to the SCSTP
Potential impact	Pollution of soil and of the Graeme Hall wetland from sewage leaks or system failure; a surge in sanitary load straining the SCSTP, leading to overflow or localized odor; nutrient and pathogen loading causing eutrophication
Risk	Pathogen contamination, elevated BOD and nutrient enrichment of confirmed Critical Habitat; public health exposure; odor nuisance at the nearest residences
Nature and type	Adverse, direct, cumulative
Extent	On-site and local, extending to the wetland through drainage
Duration	Short-term for construction; continuing through camp operation
Likelihood	3, possible
Magnitude	4, high
Pre-mitigation significance	High (3 × 4 = 12)
Mitigation summary	Certified prefabricated tertiary sewage treatment plant complying with Environmental Protection Department and Barbados Water Authority effluent criteria; hydro-test and pressure-test of all sewer lines before backfilling; installation by registered and certified technicians; confirmation of the receiving sewer's capacity with the Barbados Water Authority before connection.
Post-mitigation likelihood	2, unlikely
Post-mitigation magnitude	2, low
Residual significance	Low (2 × 2 = 4)
Significant conversion or degradation	Assessed under the Critical Habitat Assessment. Not likely to result in significant conversion or degradation, provided the Critical Habitat safeguards are incorporated into design, construction and operation and verified through monitoring. To be confirmed in the updated Critical Habitat Assessment (gate condition G-23).

Field	Assessment
Residual management	Strict preventative maintenance schedule for the treatment unit; periodic laboratory testing of treated effluent before reuse or disposal; camp load recorded against SCSTP capacity.
Depends on	Receiving sewer capacity not yet confirmed

CMP-EI-02 Habitat Loss and Disturbance to Wildlife

The camp footprint is about 6,592 m^2 of dry scrub grassland, dominated by black spear grass, with no water body and no bird habitat, and no critical habitat was observed within it. The significance of this pathway lies in what the footprint adjoins. Graeme Hall Swamp is an Important Bird Area and a roost on the Eastern Caribbean Flyway, and resident species such as the Caribbean coot have no seasonal escape from sustained disturbance. Habitat loss is certain once clearing begins, so the pathway is rated Very High before mitigation; delineated clearing limits, seasonal timing and the Habitat Restoration Plan reduce it to Low. The Roughbark lignum-vitae (Endangered) recorded just outside the project area must be kept clear of machinery. The significance of the effect on the adjoining habitat cannot be fully determined until the Critical Habitat Assessment update is complete.

Table 88 sets out the assessment of this pathway.

Table** 88**: CMP-EI-02 Habitat Loss and Disturbance to Wildlife: impact assessment

Field	Assessment
Activity	Clearing of about 6,592 m^2 of vegetation for accommodation, storage and access roads; daily activity, vehicle movement, imported materials and continuous security lighting during construction and camp operation
Potential impact	Loss of local flora and fragmentation of habitat; displacement of nesting birds and terrestrial fauna; stress and abandonment of feeding or roosting grounds; disruption of nocturnal fauna and migratory birds by lighting; introduction of pests and invasive plants; wildlife-vehicle collision, poaching and entrapment in trenches
Risk	Loss of habitat and refuge functions adjoining an Important Bird Area and confirmed Critical Habitat; effects on resident and migratory birds using the swamp
Nature and type	Adverse, direct, cumulative
Extent	Local (site, boundary and adjoining wetland)
Duration	Long-term for habitat loss (decades for mature regrowth); short-term for disturbance
Likelihood	5, almost certain

Field	Assessment
Magnitude	3, moderate
Pre-mitigation significance	Very High (5 × 3 = 15)
Mitigation summary	Clearly delineated clearing limits with high-visibility silt fencing; clearing restricted to the approved footprint and carried out outside peak bird-nesting seasons; pre-clearance walkthroughs to relocate slow-moving fauna; topsoil salvaged and stored under geotextile for progressive rehabilitation. Lighting, waste and imported-material controls to be specified at detailed design.
Post-mitigation likelihood	2, unlikely
Post-mitigation magnitude	2, low
Residual significance	Low (2 × 2 = 4)
Significant conversion or degradation	Assessed under the Critical Habitat Assessment. Not likely to result in significant conversion or degradation, provided the Critical Habitat safeguards are incorporated into design, construction and operation and verified through monitoring. To be confirmed in the updated Critical Habitat Assessment (gate condition G-23).
Residual management	Weekly boundary inspections; Habitat Restoration Plan replanting native Barbadian species in buffer zones, prepared by the Contractor, approved by the Project Execution Unit before clearance, implemented progressively and completed at decommissioning under the Contractor's Environmental and Social Manager.

CMP-EI-03 Generator Operation and Camp Noise

Generators supply the camp continuously and are the most persistent noise source on the site. Monitoring on 15 to 17 April 2026 recorded the nearest residential cluster at Location 3 at 56.3 to 60.5 dB(A), at or above the 55 dB(A) World Health Organization guideline, and monitoring covered working hours only, so no night-time baseline exists against the 45 dB(A) reference. Generator noise is therefore an increment on an existing exceedance that cannot yet be measured at night. The internal camp sources (shift changes, drills, kitchen and recreation area, parking) mainly affect workers' rest, and the controls are siting and curfews. The residual Medium rating cannot be confirmed until the night-time baseline is taken.

Table 89 sets out the assessment of this pathway.

Table** 89**: CMP-EI-03 Generator Operation and Camp Noise: impact assessment

Field	Assessment
Activity	Continuous operation of generators during construction and camp operation; shift changes, emergency drills, kitchen and recreation area activity, internal traffic and parking
Potential impact	Continuous generator noise causing annoyance, speech interference and sleep disturbance; peaks of human, vehicle and alarm noise; evening noise from group activity and music
Risk	Sleep disturbance and annoyance at residential receptors and for camp workers; community disturbance where generators run overnight
Nature and type	Adverse, direct
Extent	On-site, with community effect at Harmony Hall
Duration	Short-term (construction), continuing through camp operation
Likelihood	4, likely
Magnitude	3, moderate
Pre-mitigation significance	High (4 × 3 = 12)
Mitigation summary	Sound-attenuated generator with acoustic enclosure and vibration-damping mounts, located away from receptors and maintained; hearing protection; drills scheduled in daytime with residents notified; kitchen and recreation areas located away from dormitories, amplified music limited and a curfew set; internal speed limits, speed bumps and parking away from dormitories.
Post-mitigation likelihood	3, possible
Post-mitigation magnitude	2, low
Residual significance	Medium (3 × 2 = 6)
Significant conversion or degradation	Not applicable. No Key Biodiversity Feature is engaged directly by this pathway.
Residual management	Noise monitoring plan with continuous monitoring at Location 3; residents informed; grievance mechanism. A night-time baseline is required before the residual rating can be confirmed.
Depends on	Night-time noise baseline not yet measured

CMP-EI-04 Prefabricated Building Erection and Lifting

Lifting and placing prefabricated accommodation units is the highest-consequence activity in the camp's construction sequence, because a dropped or swinging load can be fatal. The pre-mitigation rating of Very High reflects a catastrophic magnitude, and the residual magnitude is reduced to moderate by exclusion zones and certified lifting plans. The activity is specific to the camp, since neither treatment facility uses prefabricated accommodation, and it also creates temporary access restrictions on the single access route.

Table 90 sets out the assessment of this pathway.

Table** 90**: CMP-EI-04 Prefabricated Building Erection and Lifting: impact assessment

Field	Assessment
Activity	Lifting, movement and placement of prefabricated accommodation units by crane and plant
Potential impact	Dropped or swinging loads, working at height and being struck by equipment; noise, traffic congestion and temporary access restrictions on the shared route
Risk	Serious or fatal injury to workers; temporary loss of access for the community
Nature and type	Adverse, direct
Extent	On-site, with access effects on the shared route
Duration	Short-term (erection phase)
Likelihood	3, possible
Magnitude	5, catastrophic
Pre-mitigation significance	Very High (3 × 5 = 15)
Mitigation summary	Certified lifting plans and exclusion zones; traffic segregation, banksmen and high-visibility clothing for people on the ground; equipment inspection. Detailed measures to be specified at detailed design.
Post-mitigation likelihood	3, possible
Post-mitigation magnitude	3, moderate
Residual significance	Medium (3 × 3 = 9)

Field	Assessment
Significant conversion or degradation	Not applicable. No Key Biodiversity Feature is engaged directly by this pathway.
Residual management	Permit to work for lifts; incident register; reference to the Health and Safety Management Plan.

7.3.4. Impact Assessment: Social – Access, Community Amenity and Services

These four pathways act on the community through the camp's single access route, its dust and noise, its demand on shared services and its effect on local prices. The nearest residential receptor is about 250 m from the site boundary.

Trespass and praedial larceny. Workers living at the camp could enter neighbouring farmland or take crops or livestock, which would harm farmers' livelihoods and relations with the host community. The risk is managed through the prohibition, reporting and disciplinary provisions of the Code of Conduct (Section 8.4.8.6) and the agricultural livelihoods and private property measures of the Community Health Plan (Section 8.4.10.3), and is monitored through the Grievance Redress Mechanism. The issue of these provisions to the workforce in a language each worker reads, and their verification at the monthly camp inspection, are recorded as commitments C-34 and C-35 in Annex H.

CMP-SI-01 Access, Traffic and Road Safety

All camp traffic, comprising construction vehicles, material deliveries, heavy plant and workforce transport, uses a single access route: an earthen dam of about 730 m joining the community road that serves Harmony Hall. The Workers' Camp is the largest generator of movements on that route, with peak on-site numbers reaching 203 in the third quarter of 2028, and sludge, demolition-waste and SCWRRF traffic add to it. The pathway is therefore assessed once for the shared route, and the Traffic and Pedestrian Management Plan should operate as a single integrated plan across the SCSTP upgrade, the SCWRRF works and the camp. Congestion is likely; the consequence that governs the rating is a road-safety incident, which is catastrophic and permanent where a fatality occurs, and the exposure is greatest for school children, older persons and pedestrians. Emergency care is in Bridgetown, about 7 km away, so delay on this road matters.

Table 91 sets out the assessment of this pathway.

Table** 91**: CMP-SI-01 Access, Traffic and Road Safety: impact assessment

Field	Assessment
Activity	Movement of construction vehicles, material deliveries, heavy plant and worker transport along the 730 m earthen access dam and the community road to the highway junction
Potential impact	Congestion and delay at shift change and delivery peaks; vehicular accidents involving workers, residents or pedestrians; damage to the

Field	Assessment
	road surface
Risk	Reduced access for residents, businesses and emergency vehicles; injury or loss of life, with particular exposure for school children, older persons, persons with disabilities and pedestrians
Nature and type	Adverse, direct
Extent	Local (access route and community roads serving Harmony Hall)
Duration	Temporary (construction); permanent where a fatality occurs
Likelihood	4, likely
Magnitude	3, moderate
Pre-mitigation significance	High (4 × 3 = 12)
Mitigation summary	Traffic Management Plan approved by the PEU and BWA covering haul routes, peak-hour restrictions, signage, safe crossing points, flaggers and diversions; movement windows avoiding school travel times, with a restricted window from 14:30; access for residents, businesses and emergency vehicles maintained except for short pre-notified closures; driver induction on speed, reversing, pedestrian awareness and fatigue; trained flaggers at high-risk junctions; vehicles inspected and drivers fit for duty.
Post-mitigation likelihood	3, possible
Post-mitigation magnitude	2, low
Residual significance	Medium (3 × 2 = 6)
Significant conversion or degradation	Not applicable. No Key Biodiversity Feature is engaged directly by this pathway.
Residual management	Complaints monitored through the GRM; movement windows reviewed quarterly; all incidents and near-misses reported immediately to the PEU; disciplinary framework under the Code of Conduct; routine liaison with the Planning and Development Department and the traffic police.

CMP-SI-02 Dust, Noise and Disruption at Community Receptors

The nearest residential receptor is about 250 m from the site and is rated high sensitivity, and 25.8 percent of residents are aged 65 and over against 13.57 percent nationally. Dust and noise from the camp's construction and from generators acting on those residents are increments on conditions that already sit at or near guideline values: PM_{10} of 59.61 µg/m^3 over twelve hours at Location 1, Saharan dust between June and August, and daytime noise at or above 55 dB(A) at Location 3. This pathway assesses the community-facing effect of the camp's own activities and the disruption they cause to daily routines, trading and events. Dust and noise from the treatment facilities add to the same receptors and are assessed in the SCSTP and SCWRRF chapters.

Table 92 sets out the assessment of this pathway.

Table** 92**: CMP-SI-02 Dust, Noise and Disruption at Community Receptors: impact assessment

Field	Assessment
Activity	Site clearance, earthworks, vehicle movement on unsealed surfaces, construction plant, deliveries and generator operation, including overnight
Potential impact	Fugitive dust affecting residences, farmland and the Ministry of Agriculture office; noise at the nearest residential receptors; disruption to daily routines, access, trading and community events
Risk	Nuisance, respiratory irritation, sleep disturbance and loss of amenity for residents, in a population in which 25.8 percent are aged 65 and over
Nature and type	Adverse, direct, cumulative
Extent	Local (Harmony Hall at about 280 m; Ministry of Agriculture at about 254 m)
Duration	Temporary (construction), including night-time periods
Likelihood	5, almost certain
Magnitude	3, moderate
Pre-mitigation significance	Very High (5 × 3 = 15)
Mitigation summary	Adherence to EPD parameters for dust and noise; dust suppression plan with watering of haul routes and stockpiles, covered loads, wheel-wash, speed restrictions and suspension of works in high wind; acoustic screening of generators, night-time plant restrictions and lower-noise equipment; community communication plan with a published disruption schedule, scheduling around religious, school and community events and at least seven days' notice of planned disruption.
Post-mitigation likelihood	3, possible

Field	Assessment
Post-mitigation magnitude	2, low
Residual significance	Medium (3 × 2 = 6)
Significant conversion or degradation	Not applicable. No Key Biodiversity Feature is engaged directly by this pathway.
Residual management	Daily visual dust monitoring and PM monitoring at the nearest receptor; continuous noise monitoring at Location 3 and complaint-triggered monitoring; quarterly community meetings. Night-time noise baseline required before the residual rating can be confirmed.
Depends on	Night-time noise baseline not yet measured

CMP-SI-03 Pressure on Services and Utilities

An occupied camp places a resident workforce of 120 at peak, with up to 83 further personnel by day, on infrastructure that serves Harmony Hall. Barbados is among the most water-scarce countries in the world, and the two local clinics offer no 24-hour emergency service, so the camp is designed for self-sufficiency in water, power and sanitation and for on-site primary care. A second concern is the connection of camp services: interruption of power to the existing plant can lead to bypass, which is assessed in the SCSTP chapter.

Table 93 sets out the assessment of this pathway.

Table** 93**: CMP-SI-03 Pressure on Services and Utilities: impact assessment

Field	Assessment
Activity	Site works and connection of camp services; occupation of the camp by a resident workforce of 98 at peak (80 workers and 18 management personnel) with up to 105 further personnel by day
Potential impact	Interruption to water, electricity or telecommunications serving nearby households, businesses and the existing treatment plant; increased demand on water, electricity, health care, waste services and housing
Risk	Reduced availability or quality of services for residents; loss of power to the plant, which can lead to bypass
Nature and type	Adverse, indirect, cumulative
Extent	Local (Harmony Hall and settlements served by the same infrastructure)
Duration	Temporary (hours to days per interruption; duration of construction for

Field	Assessment
	demand)
Likelihood	4, likely
Magnitude	2, low
Pre-mitigation significance	Medium (4 × 2 = 8)
Mitigation summary	Utilities management schedule agreed with each operator, with planned outages and restoration procedures agreed before work begins and advance notification through the Stakeholder Engagement Plan; camp designed for self-sufficiency in water, power and sanitation so far as practicable; utility consumption and management plan; on-site primary care so that workers do not displace community access to health services; worker transport provided.
Post-mitigation likelihood	3, possible
Post-mitigation magnitude	2, low
Residual significance	Medium (3 × 2 = 6)
Significant conversion or degradation	Not applicable. No Key Biodiversity Feature is engaged directly by this pathway.
Residual management	Outage and restoration log reported monthly to the PEU; consumption monitored against the baseline and reported quarterly; review if the workforce exceeds the assumed peak.

CMP-SI-04 Inflationary Pressure and End-of-Construction Contraction

About one household in four in the area holds its home on a tenancy, and those households are exposed if a non-local workforce competes for rental stock or if landlords convert to short-term letting. Barbados does not publish an official national poverty line, so the margin by which households are exposed to price increases is judged from comparative indicators. The Low residual rating cannot be tested until a pre-construction price baseline exists. The end-of-construction contraction is lower in significance, but it is the mirror image of the same dependence.

Table 94 sets out the assessment of this pathway.

Table** 94**: CMP-SI-04 Inflationary Pressure and End-of-Construction Contraction: impact assessment

Field	Assessment
Activity	Presence of a wage-earning workforce and project procurement in the

Field	Assessment
	local economy; end of project spending and employment at demobilization
Potential impact	Localized price escalation for food, goods, services and rental accommodation; economic contraction when construction ends
Risk	Reduced purchasing power for low-income households, especially renters (about one household in four); loss of income for locally engaged workers and suppliers
Nature and type	Adverse, indirect, cumulative
Extent	Local (Harmony Hall and adjacent communities; project area of influence)
Duration	Temporary (construction); short-term at and after demobilization
Likelihood	3, possible
Magnitude	2, low
Pre-mitigation significance	Medium (3 × 2 = 6)
Mitigation summary	Local procurement prioritized where quality, safety and cost standards are met and procurement does not cause price escalation; inflation monitoring against a pre-construction price baseline; housing plan to limit competition for local rental stock; Local Skills Development and Inclusion Plan with transferable training; advance notice of demobilization; supplier diversification.
Post-mitigation likelihood	2, unlikely
Post-mitigation magnitude	2, low
Residual significance	Low (2 × 2 = 4)
Significant conversion or degradation	Not applicable. No Key Biodiversity Feature is engaged directly by this pathway.
Residual management	Proportion of goods and services procured locally and price trends reported quarterly; training completions and suppliers with non-project revenue tracked.
Depends on	Pre-construction price baseline not yet established

7.3.5. Impact Assessment: Social – Workforce, Health and Gender

These four pathways arise from the presence of a resident non-local workforce. They are the camp's most consequential pathways, and three of them correspond to Program-level pathways assessed at Project level.

CMP-SI-05 Labor Influx, Worker-Community Interaction and Community Cohesion

This pathway is the camp-specific counterpart of the Program-level labor influx pathway PRJ-SI-02. The camp is the only component that houses a predominantly non-local workforce, and friction with a small residential and agricultural community is almost certain, which is why it is rated Very High before mitigation. The rating depends on workforce size and nationality mix, which the Contractor has not yet confirmed. Public confidence in the Project is assessed here because it follows from the same presence and is controlled by the same measures.

Table 95 sets out the assessment of this pathway.

Table** 95**: CMP-SI-05 Labor Influx, Worker-Community Interaction and Community Cohesion: impact assessment

Field	Assessment
Activity	Accommodation of a predominantly non-local workforce at the camp; visible construction activity in a small residential and agricultural community
Potential impact	Pressure on community cohesion, altered social dynamics and worker-community friction; adverse effects on sense of security and public confidence in the Project
Risk	Community tension, exclusion of vulnerable groups, heightened SH/SEA/GBV risk including against women, girls and youth, and erosion of the Project's social license
Nature and type	Adverse, indirect, cumulative, induced
Extent	Local, extending to settlements served by the same road network and social infrastructure
Duration	Temporary (construction), with reputational effects capable of persisting
Likelihood	5, almost certain
Magnitude	3, moderate
Pre-mitigation significance	Very High (5 × 3 = 15)
Mitigation summary	Worker Influx Management Plan operating with the Code of Conduct, GRM, Stakeholder Engagement Plan and Labour Management Plan; worker-community interaction protocol; local hiring prioritized with

Field	Assessment
	targets; cultural integration training and onboarding; structured community engagement and awareness plan; multilingual communication strategy; accessible GRM with feedback reported to the community; quarterly community meetings.
Post-mitigation likelihood	3, possible
Post-mitigation magnitude	2, low
Residual significance	Medium (3 × 2 = 6)
Significant conversion or degradation	Not applicable. No Key Biodiversity Feature is engaged directly by this pathway.
Residual management	Grievances monitored by category and origin; plan reviewed if workforce numbers, nationality mix or occupancy change materially; escalation to the PEU where community confidence is affected.
Depends on	Workforce numbers and nationality mix to be confirmed by the Contractor

CMP-SI-06 Community Health and Disease Transmission

The camp sits beside an operating sewage works, so workers and nearby residents share exposure to biological aerosols, hydrogen sulfide and, through standing water, vector-borne disease. Vector-borne disease is the health concern most consistently raised by residents adjacent to the swamp, and three disease-competent mosquito species are present there. Odor and vector breeding from the plant itself are assessed in the SCSTP chapter; this pathway concerns the camp's exposure and its contribution. The monitoring requirements and controls are provisional until the Community Health Assessment is complete.

Table 96 sets out the assessment of this pathway.

Table** 96**: CMP-SI-06 Community Health and Disease Transmission: impact assessment

Field	Assessment
Activity	Camp occupation adjacent to an operating sewage treatment plant, and worker-community interaction
Potential impact	Communicable disease transmission; vector-borne disease associated with wastewater and standing water; exposure to biological aerosols and hydrogen sulfide
Risk	Illness among workers and the surrounding community

Field	Assessment
Nature and type	Adverse, direct and indirect, cumulative
Extent	Local (camp, plant environs and Harmony Hall)
Duration	Temporary (construction), with potential for longer-term health effects
Likelihood	4, likely
Magnitude	3, moderate
Pre-mitigation significance	High (4 × 3 = 12)
Mitigation summary	Health management plan and Community Health and Safety Plan; specific assessment and control of wastewater exposure pathways covering biological aerosols, hydrogen sulfide, direct and indirect wastewater contact and vector-borne disease; heat stress prevention, hydration and rest-break scheduling; vector control and elimination of standing water; coordination with local health authorities; awareness training for workers.
Post-mitigation likelihood	2, unlikely
Post-mitigation magnitude	3, moderate
Residual significance	Medium (2 × 3 = 6)
Significant conversion or degradation	Not applicable. No Key Biodiversity Feature is engaged directly by this pathway.
Residual management	Health surveillance and incident reporting to the PEU; monitoring requirements and control measures to be confirmed against the Community Health Assessment when complete.
Depends on	Community Health Assessment not yet complete

CMP-SI-07 Sexual Exploitation and Abuse, Sexual Harassment and Gender-Based Violence

This pathway is the camp-specific counterpart of the Program-level gender-based violence pathway PRJ-SI-03 and includes harassment of workers inside the camp, which no other component generates. It carries the highest consequence in the social assessment, because harm to survivors is permanent and may involve minors. Barbados has no national prevalence study, 62 percent of women surveyed reported intimate partner violence, and 20 of the 29 applicable legal instruments are gender neutral, so the controls in the Management Plan carry the weight. The residual rating remains High because the consequence of any single incident is severe irrespective of frequency.

Table 97 sets out the assessment of this pathway.

Table** 97**: CMP-SI-07 Sexual Exploitation and Abuse, Sexual Harassment and Gender-Based Violence: impact assessment

Field	Assessment
Activity	Presence of a predominantly male non-local workforce near the community; shared accommodation, supervision relationships and unequal power relations in employment
Potential impact	Sexual harassment, sexual exploitation and abuse and gender-based violence affecting community members and workers, particularly women and girls; harassment of workers by other workers, supervisors or security personnel
Risk	Physical, psychological and sexual harm, including harm to minors; a hostile working environment
Nature and type	Adverse, direct and indirect
Extent	Local (camp and surrounding communities)
Duration	Permanent where harm occurs; risk period coincides with construction
Likelihood	3, possible
Magnitude	5, catastrophic
Pre-mitigation significance	Very High (3 × 5 = 15)
Mitigation summary	Standalone SH/SEA/GBV Prevention and Response Plan with confidential reporting channels, survivor-centered referral, sanctions and disciplinary framework, monitoring indicators and training records; Code of Conduct signed by all workers and displayed in languages commonly spoken on site; mandatory induction training with refreshers for workers, supervisors, subcontractors and security personnel; referral pathway mapping to health, police, shelters, hotlines and legal aid; GRM with a survivor-centered protocol. Community awareness activities. Written anti-harassment policy meeting the requirements of the Sexual Harassment (Prevention) Act and the Employment (Prevention of Discrimination) Act; Code of Conduct and GRM covering all worker categories including subcontractors, security personnel and service providers; mandatory training at induction with periodic refreshers and attendance records; psychosocial hazards included in the hazard identification and risk assessment.
Post-mitigation likelihood	2, unlikely

Field	Assessment
Post-mitigation magnitude	5, catastrophic
Residual significance	High (2 × 5 = 10)
Significant conversion or degradation	Not applicable. No Key Biodiversity Feature is engaged directly by this pathway.
Residual management	Serious cases reported immediately to the PEU under agreed protocol; anonymized aggregate reporting monthly; HIRA reviewed where the GRM reveals a pattern. Residual significance remains High because the consequence of any single incident is severe irrespective of frequency. Monitored through the GRM with survivor-centered handling where the complaint concerns SH/SEA/GBV. Assessed separately from the SH/SEA/GBV row, which addresses community-facing risk, and from Unfair Treatment, which addresses discrimination.

CMP-SI-08 Fair Treatment, Recruitment, Pay and Labor Rights

The Contractor directly employs one woman, in project management, and women's participation otherwise arises through local subcontractors, so recruitment, pay and rights controls must be flowed down into subcontract terms. These six issues share a mitigation framework, the Labour Management Plan and the Code of Conduct, and are assessed together. The communication element matters because the workforce includes non-English-speaking workers alongside an English-speaking community, and translation coverage cannot be sized until the workforce language profile is provided.

Table 98 sets out the assessment of this pathway.

Table** 98**: CMP-SI-08 Fair Treatment, Recruitment, Pay and Labor Rights: impact assessment

Field	Assessment
Activity	Recruitment, supervision, pay and management of the workforce, including subcontracted workers and non-English-speaking workers
Potential impact	Discrimination and unfair treatment; engagement of persons below the legal working age; discriminatory recruitment excluding women and persons with disabilities; differential pay for work of equal value; breach of workers' rights on hours, wages, rest and association; communication failure affecting safety and access to the grievance mechanism
Risk	Harm to workers, exclusion from employment, economic disadvantage to women, and non-compliance with national labor law and IDB ESPS 2
Nature and type	Adverse, direct
Extent	On-site and local

Field	Assessment
Duration	Temporary (duration of employment); permanent where a child is harmed
Likelihood	3, possible
Magnitude	3, moderate
Pre-mitigation significance	Medium (3 × 3 = 9)
Mitigation summary	Non-discrimination and equal opportunity policy with documented selection criteria and gender-sensitive hiring; age verification against official documents with a Register of Young Persons; pay by grade benchmarked against national data; Labour Management Plan covering PPE, hours, overtime, rest days, freedom of association and conditions; written contracts in a language each worker understands; multilingual materials, interpreters and pictorial signage; requirements flowed down into all subcontracts.
Post-mitigation likelihood	2, unlikely
Post-mitigation magnitude	2, low
Residual significance	Low (2 × 2 = 4)
Significant conversion or degradation	Not applicable. No Key Biodiversity Feature is engaged directly by this pathway.
Residual management	Grievances and disciplinary outcomes disaggregated and reviewed monthly; recruitment outcomes by sex and role, and the pay equity ratio, reported quarterly; recruitment records open to PEU audit; unannounced inspections of camp conditions; translation coverage confirmed against the workforce language profile.
Depends on	Workforce language profile not yet provided

7.3.6. Beneficial Effects

The camp's principal beneficial effect is employment and skills for residents of the area of influence.

CMP-BEN-01 Employment and Skills

This is the camp's principal beneficial effect and corresponds to Program-level employment, local hiring and procurement (PRJ-SI-01). The other beneficial effects previously listed against the camp, including reclaimed water for irrigation, aquifer recharge and the debt-for-climate financing, are delivered by the

reclamation facility and the wider Program and are assessed in the SCWRRF chapter. Temporary construction roles should be distinguished from longer-term operational roles in reporting.

Table 99 sets out the assessment of this pathway.

Table** 99**: CMP-BEN-01 Employment and Skills: impact assessment

Field	Assessment
Activity	Recruitment for camp construction and for operation of the reclamation facility
Opportunity	Creation of employment and transferable skills for residents of the project area of influence
Outcome	Increased household income and local skills base
Nature and type	Beneficial, Direct
Extent	Local and national
Duration	Temporary during construction; long-term for operational roles
Likelihood	5, almost certain
Magnitude	3, moderate
Pre-mitigation significance	Beneficial (5 × 3 = 15)
Enhancement summary	Hiring plan prioritizing local recruitment with transparent practices; Local Skills Development and Inclusion Plan identifying training opportunities for women, youth, persons with disabilities and other vulnerable groups; accredited training where feasible.
Post-mitigation likelihood	5, almost certain
Post-mitigation magnitude	4, high
Residual significance	Beneficial (5 × 4 = 20)
Significant conversion or degradation	Not applicable (beneficial outcome)
Residual management	Report jobs created disaggregated by sex, skill level and contract type, distinguishing temporary construction roles from longer-term operational roles.

7.3.7. Pathways Assessed in Other Sections

Table 100 lists the activities that appear in the camp's construction program but are assessed once for the shared site in the SCSTP and SCWRRF chapters. The ratings and measures there apply to the camp without variation. Where the camp adds an increment, it is stated in the final column.

Table** 100**: Camp activities assessed in the SCSTP and SCWRRF chapters

Camp activity	Assessed in	Camp-specific note
Earthworks, grading, stockpiles and site preparation (erosion, sediment, runoff, ponding)	Sediment and runoff to the eastern gully and Eastern Marsh (PRJ-EI-01)	Camp earthworks add to the combined footprint; sediment controls are common
Concrete works and washdown (high-pH washout, cement waste)	SCSTP and SCWRRF construction pathways for waste and accidental release (STP-EI-09, STP-EI-15)	Camp washout pits follow the common standard
Fuel, oil and chemical storage and refueling	Accidental and emergency release (STP-EI-15; reclamation facility equivalent)	Camp stocks are held concurrently on adjacent land; one emergency arrangement
Heavy plant, dust and noise from construction	Air quality and dust (STP-EI-06); noise and vibration (STP-EI-07)	Camp plant adds to combined exposure; community effect assessed at CMP-SI-02
Construction waste, spoil and temporary waste storage	Waste, spoil and hazardous materials (STP-EI-09)	Camp waste log is common
Occupational injury, manual handling, electrical hazard, cement contact	Health and Safety Management Plan; occupational limits in the HSE Management Manual	Not an environmental pathway; managed under the HSE instruments
Excavation chance finds	Chance find of cultural heritage (STP-EI-12; PRJ-EI-13)	Chance Find Procedure applies to camp excavation
Vector breeding from standing water	Vector breeding (STP-EI-10; PRJ-EI-16)	Camp standing water included; health exposure at CMP-SI-06
Reclaimed water, aquifer recharge, irrigation, food security, debt-for-climate financing	SCWRRF beneficial effects	Not delivered by the camp

7.3.8. Summary of Significance

Of the 12 adverse Workers' Camp pathways, 5 are rated Very High before mitigation, 4 High and 3 Medium. The Very High pathways are habitat loss and wildlife disturbance (CMP-EI-02), prefabricated building erection and lifting (CMP-EI-04), dust, noise and disruption at community receptors (CMP-SI-02), labor influx and community cohesion (CMP-SI-05), and sexual exploitation and abuse, sexual harassment and gender-based violence (CMP-SI-07). They reflect a resident non-local workforce of 120 at peak, a single access route shared with the community, and a footprint beside confirmed Critical Habitat. After mitigation, none remains Very High or Critical. One pathway remains High, CMP-SI-07, because the consequence of any single incident is severe irrespective of frequency, so management concentrates on prevention and response capability. Seven are Medium and four are Low. The residual ratings for generator and camp noise (CMP-EI-03) and for dust, noise and disruption at community receptors (CMP-SI-02) cannot be confirmed until a night-time noise baseline is taken at Harmony Hall. The rating for camp sewage discharge (CMP-EI-01) assumes confirmation of the receiving sewer's capacity. The single beneficial pathway, employment and skills (CMP-BEN-01), is rated Beneficial both before and after enhancement and corresponds to the Program-level employment pathway PRJ-SI-01. CMP-EI-04 and CMP-SI-07 have a catastrophic magnitude and are priority pathways under Section 5.3.

Table** 101**: Workers' Camp summary of significance

Ref	Pathway	Pre-mitigation	Residual
CMP-EI-01	Camp Wastewater and Sewage Discharge	High (12)	Low (4)
CMP-EI-02	Habitat Loss and Disturbance to Wildlife	Very High (15)	Low (4)
CMP-EI-03	Generator Operation and Camp Noise	High (12)	Medium (6)
CMP-EI-04	Prefabricated Building Erection and Lifting (Priority)	Very High (15)	Medium (9)
CMP-SI-01	Access, Traffic and Road Safety	High (12)	Medium (6)
CMP-SI-02	Dust, Noise and Disruption at Community Receptors	Very High (15)	Medium (6)
CMP-SI-03	Pressure on Services and Utilities	Medium (8)	Medium (6)
CMP-SI-04	Inflationary Pressure and End-of-Construction	Medium (6)	Low (4)

Ref	Pathway	Pre-mitigation	Residual
	Contraction		
CMP-SI-05	Labor Influx, Worker-Community Interaction and Community Cohesion	Very High (15)	Medium (6)
CMP-SI-06	Community Health and Disease Transmission	High (12)	Medium (6)
CMP-SI-07	Sexual Exploitation and Abuse, Sexual Harassment and Gender-Based Violence (Priority)	Very High (15)	High (10)
CMP-SI-08	Fair Treatment, Recruitment, Pay and Labor Rights	Medium (9)	Low (4)
CMP-BEN-01	Employment and Skills	Beneficial (15)	Beneficial (20)

7.4. Summary of Impacts: SCSTP, SCWRRF and Workers' Camp

The SCSTP upgrade, the SCWRRF and the Workers' Camp share one footprint, one set of receptors and one access route. This section summarizes their impacts together. It is a reading aid: where it differs from an individual pathway table, the pathway table governs. Ratings are likelihood multiplied by magnitude on the five by five matrix (1 to 4 Low, 5 to 9 Medium, 10 to 14 High, 15 to 19 Very High, 20 to 25 Critical). Table 102 shows the number of adverse pathways in each rating band, before and after mitigation. Beneficial pathways are excluded from the counts.

Table** 102**: Adverse pathways by rating band, before and after mitigation

Component	Adverse pathways	Pre-mitigation	Residual (after mitigation)
SCSTP upgrade	14	2 Critical, 1 Very High, 1 High to Very High, 9 High, 1 Medium	1 High, 1 Medium to High, 7 Medium, 5 Low
SCWRRF (environmental)	16	1 Critical, 2 Very High, 2 High to Very High, 7 High, 4 Medium	1 High, 1 Medium to High, 6 Medium, 2 Low to Medium, 6 Low
Project-level social (apply to all three	6 adverse, plus employment	1 Critical, 1 Very High, 3	1 High, 2 Medium, 3 Low

components)	(positive)	High, 1 Medium	
Workers' Camp	12 adverse, plus employment (beneficial)	5 Very High, 4 High, 3 Medium	1 High, 7 Medium, 4 Low

Several pathways appear in more than one chapter because the works act on the same receptors, for example wetland conveyance (STP-EI-11 and PRJ-EI-14), accidental release (STP-EI-15 and PRJ-EI-15) and traffic (STP-EI-08 and PRJ-EI-07). They are counted once per chapter, so the totals are not additive. Table 103 lists every pathway rated Critical or Very High before mitigation, with its residual rating.

Table** 103**: Pathways rated Critical or Very High before mitigation

Ref	Component	Pathway	Pre-mitigation	Residual
STP-EI-01	SCSTP	Discharge during bypass or construction (Priority)	Critical	High
STP-EI-02	SCSTP	Emergency bypass activation (Priority)	Very High	Medium
STP-EI-15	SCSTP	Accidental and emergency release (Priority)	High to Very High	Medium
STP-EI-08	SCSTP	Traffic and road safety (Priority)	Critical	Medium
STP-SI-04	SCSTP	Community health and safety	Very High	Medium
PRJ-EI-09	SCWRRF	Reclaimed water quality, aquifer recharge and agricultural reuse (Priority)	Very High	Medium
PRJ-EI-15	SCWRRF	Accidental and emergency release (Priority)	High to Very High	Medium
PRJ-EI-07	SCWRRF	Traffic and road safety (Priority)	Critical	Medium
PRJ-EI-01	SCWRRF	Runoff, sediment transport and water quality	Very High	Low to Medium
PRJ-EI-02	SCWRRF	Vegetation clearance and habitat loss	High to Very High	High
PRJ-SI-03	Project-level	Sexual exploitation and abuse, sexual harassment and gender-based violence (Priority)	Critical	High
PRJ-SI-04	Project-level	Community health and safety	Very High	Medium
CMP-SI-07	Workers'	Sexual exploitation and abuse, sexual	Very High	High

Ref	Component	Pathway	Pre-mitigation	Residual
	Camp	harassment and gender-based violence (Priority)		
CMP-EI-02	Workers' Camp	Habitat loss and disturbance to wildlife	Very High	Low
CMP-EI-04	Workers' Camp	Prefabricated building erection and lifting (Priority)	Very High	Medium
CMP-SI-02	Workers' Camp	Dust, noise and disruption at community receptors	Very High	Medium
CMP-SI-05	Workers' Camp	Labor influx, worker-community interaction and community cohesion	Very High	Medium

7.4.1. Summary of Impacts

7.4.1.1. SCSTP upgrade

The works take place on a live plant, so the main impacts are discharge-related: bypass during construction, emergency bypass activation, accidental release of chemicals or fuel, and the interface between construction and plant operations.

These pathways reach Graeme Hall Swamp, which is confirmed Critical Habitat. Bypass during construction is rated Critical before mitigation and High after. Emergency bypass and accidental release are rated Very High, or High to Very High, before mitigation and Medium after. Mitigation reduces their likelihood but not the severity of a release if one occurs.

Odor, dust, noise and traffic affect residents about 250 m away, and most reduce to Low or Medium.

The upgrade's main beneficial effect is removing a continuing pollution source. It is assessed against a quantified starting point and depends on the upgrade and the SCWRRF both being completed.

7.4.1.2. SCWRRF

The highest-rated pathways are traffic and road safety (Critical before mitigation), reclaimed water quality for aquifer recharge and sediment and runoff (Very High), and accidental release and vegetation clearance (High to Very High). All reduce to Medium or below after mitigation except vegetation clearance, which stays High because clearance within the approved footprint is certain.

Recharge water quality matters because the karst aquifer provides little natural attenuation. The groundwater baseline and the Zone 5 designation are both unconfirmed.

Its benefits (irrigation water, reduced potable abstraction, recharge) depend on the SCSTP upgrade and on allocation and pricing decisions that are not yet made.

7.4.1.3. Workers' Camp

Twelve adverse pathways: 5 Very High, 4 High and 3 Medium before mitigation. After mitigation, 1 is High, 7 Medium and 4 Low.

The Very High pathways are habitat loss and wildlife disturbance, prefabricated building erection, community dust and noise, labor influx, and gender-based violence.

The only camp pathway that stays High is gender-based violence, because the consequence of a single incident is severe whatever the frequency.

The camp's own benefit is local employment and skills.

7.4.1.4. Cross-cutting findings

- **Same receptors.** Almost every high-rated pathway ends at Graeme Hall Swamp or at residents about 250 m away, who are older than the national profile (25.8 percent aged 65 and over).
- **Single access route.** The 730 m earthen dam carries the traffic of all three components, so it is assessed once and needs one integrated traffic plan.
- **What mitigation does not fix.** Mitigation lowers the likelihood of bypass, accidental release, off-specification recharge water, road injury and gender-based violence, but not the severity of the outcome if one occurs. Bypass during construction and gender-based violence stay High; the others reduce to Medium and keep the highest management priority. These are the priority pathways defined in Section 5.3, marked (Priority) in Table 103. A Medium or High residual rating for a priority pathway does not relax its gate conditions, verification or monitoring.
- **Routine effects.** Dust, noise, waste and temporary disruption reduce to Low or Medium and are temporary.

7.5. Critical Habitat Assessment

The purpose of the Rapid CHA was to assess whether biodiversity features within the area potentially affected by the Project meet the Inter-American Development Bank (IDB) criteria for Critical Habitat, and, where applicable, to identify the implications for impact assessment, mitigation, management, and monitoring. The Rapid CHA is a specialized biodiversity assessment designed to complement, rather than replace, the broader environmental and social assessment and management processes for the project. It should therefore be read alongside the Project's Environmental and Social Impact Assessment (ESIA), Environmental and Social Management Plan (ESMP), Environmental and Social Management System (ESMS), as well as related technical studies and baseline data.

Table 104 presents the critical habitat screening criteria applied in this assessment.

Table** 104**: Critical Habitat Screening Criteria Applied in this Assessment

CRITERION	APPLICATION IN THE CHA
A. EXISTING OR PROPOSED PROTECTED AREA / INTERNATIONALLY RECOGNIZED SITE	Determines whether an area is formally protected, proposed for protection, or recognized under an international conservation designation, including the Ramsar Convention.
B. AREA NECESSARY TO MAINTAIN A PROTECTED AREA	Considers adjoining areas, waterways, buffers, hydrological connections or ecological processes necessary to maintain the viability or ecological character of a protected area.

CRITERION	APPLICATION IN THE CHA
C. HABITAT CRUCIAL FOR CR/EN/VU/NT SPECIES	Determines whether habitat is crucial for the survival, feeding, breeding, refuge or movement of species classified as Critically Endangered, Endangered, Vulnerable or Near Threatened.
D. ENDEMIC OR RANGE-RESTRICTED SPECIES	Considers whether the area supports endemic or geographically restricted species for which the affected habitat is particularly important.
E. MIGRATORY SPECIES, ROUTES OR CONGREGATIONS	Determines whether the area provides important habitat for migratory routes, feeding, breeding, refuge or significant congregations of migratory species.
F. HABITAT HIGHLY SUITABLE FOR BIODIVERSITY CONSERVATION	Considers conservation importance arising from factors such as habitat vulnerability and irreplaceability, rare or threatened ecosystems, refugia, ecological processes, connectivity and important ecosystem functions or services.

Source: adapted from IDB (2015).

The map below in Figure 61 shows the core critical habitat area. It comprises the Ramsar site and its constituent wetland habitats.

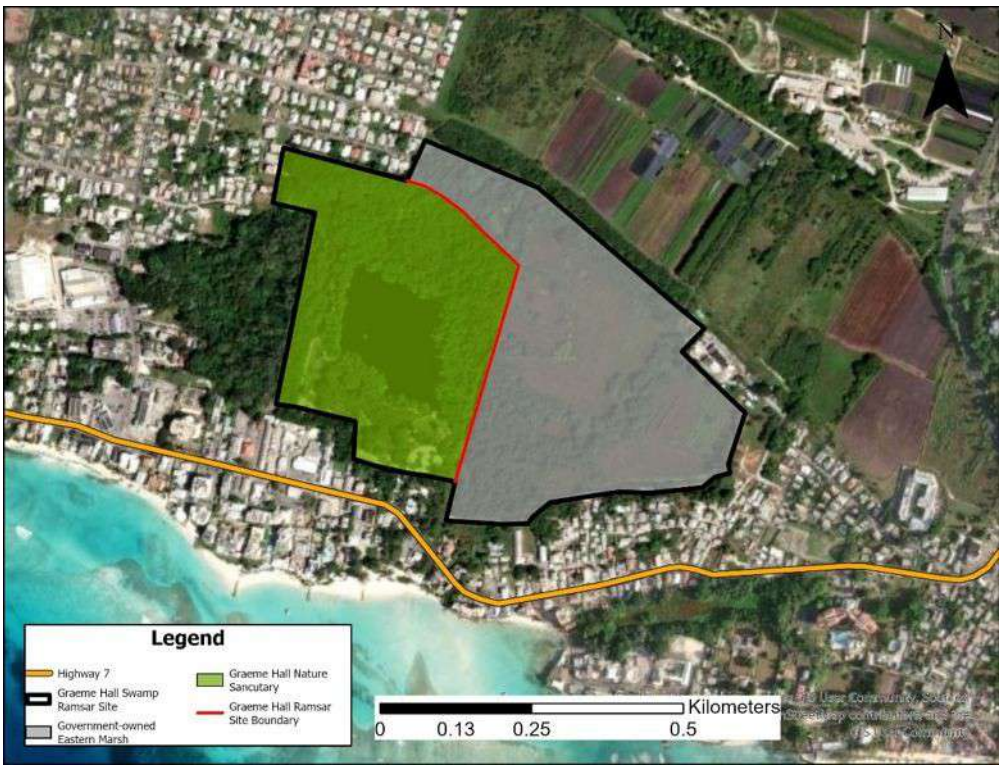


Figure *61*: Core Critical Habitat Area Map

Graeme Hall Swamp is confirmed as Critical Habitat and Critical Natural Habitat under Criterion A, and that determination governs the assessment of every pathway capable of reaching the wetland. This section records the determination, the criteria on which it rests, the Key Biodiversity Features identified, the priority species screened, and the interface between the Project and the habitat.

The determination is established independently through confirmed Criteria A, B and F, so it does not depend on the criteria retained as potential triggers. The practical consequence is set out at Section 5.5: each Project pressure acting on a Key Biodiversity Feature is additionally assessed against the significant

conversion or degradation test, and the presence of an impact pathway does not of itself establish significance.

7.5.1. Determination

Table 105 shows the critical habitat determination per criterion. The Graeme Hall Swamp is confirmed as Critical Habitat and Critical Natural Habitat under the applicable Inter-American Development Bank framework.

Table** 105**: Critical Habitat determination by criterion

Criterion	Key Biodiversity Feature	Determination
A, protected or internationally recognized area	KBF 1	Confirmed trigger. Ramsar Site No. 1591, Wetland of International Importance
B, area necessary to maintain a protected or internationally recognized area	KBF 1, KBF 2, KBF 5	Confirmed trigger. Desktop and field evidence demonstrate hydrological and ecological connections through the Project and wetland interface, the interconnected wetland drainage system and the downstream coastal connection
C, habitat crucial for threatened species	KBF 6	Potential trigger, not independently confirmed by population level evidence. Lignum vitae confirmed at station FV-01
D, endemic or range-restricted species	KBF 4	Potential trigger, not independently confirmed by population level evidence
E, migratory or congregatory species	KBF 3	Potential trigger, retained at high confidence
F, habitat highly suitable for biodiversity conservation	KBF 1, KBF 2	Confirmed trigger. Largest remaining mangrove, marsh and open water system of its type in Barbados, retaining nationally significant ecological function and biodiversity support value

The overall determination is established independently through the confirmed criteria A, B and F. Criteria C, D and E do not affect that determination. The associated threatened, endemic, range-restricted and migratory species remain Key Biodiversity Features and sensitive receptors for Project environmental management and monitoring.

7.5.2. Key Biodiversity Features

For the purposes of the CHA, closely related biodiversity features were consolidated into six candidate Key Biodiversity Features (KBFs) as shown in Table 106. These KBFs capture the principal ecological values and ecological processes that require formal Critical Habitat assessment. The identification of these KBFs represents a screening outcome rather than a definitive Critical Habitat determination. Each KBF was carried forward for systematic evaluation against the applicable IDB criteria, taking into account the strength of evidence, ecological importance, and spatial relevance to the Project.

Table** 106**: Key Biodiversity Features

Feature	Description
KBF 1	Ramsar wetland and its ecological character
KBF 2	Hydrological and ecological processes supporting Graeme Hall
KBF 3	Migratory and congregatory wetland birds
KBF 4	Endemic and range-restricted resident birds
KBF 5	Connected coastal and marine habitats
KBF 6	Threatened species associated with the Project and the Critical Habitat Assessment Area

7.5.3. Priority Species

Fifteen priority species were screened against Criteria C, D, E and F. The full Priority Species Screening Matrix is available in Annex B. From this activity, the following species carry the highest relevance:

Little Egret, *Egretta garzetta*. Rated Very High under Criterion E. Historical evidence indicates that Graeme Hall Swamp supported at least one percent of a biogeographic population and an important breeding colony.

Snowy Egret, *Egretta thula,* **Cattle Egret,** *Bubulcus ibis*. Rated High and Supporting respectively under Criteria E and F as components of the nesting and roosting assemblage.

Barbados Bullfinch, *Loxigilla barbadensis*. A Barbados endemic rated High under Criterion D, with contemporary occurrence confirmed in the Project environs in April 2026.

Barbados Yellow Warbler, *Setophaga petechia*. Rated High under Criterion D on the basis of a historical breeding population at the swamp.

Semipalmated Sandpiper, *Calidris pusilla*. Near Threatened, rated High under Criteria C and E as a long distance migratory shorebird recorded at the swamp.

A range-restricted resident assemblage under Criterion D comprises Green-throated Carib, Antillean Crested Hummingbird and Caribbean Elaenia. A migratory wetland assemblage under Criterion E comprises American Golden-Plover, Lesser Yellowlegs, Stilt Sandpiper and Short-billed Dowitcher.

7.5.4. Project and Habitat Interface

Figure 62 shows the Project–Habitat Interface Area which comprises Project areas from which direct or indirect effects on the wetland could reasonably occur.

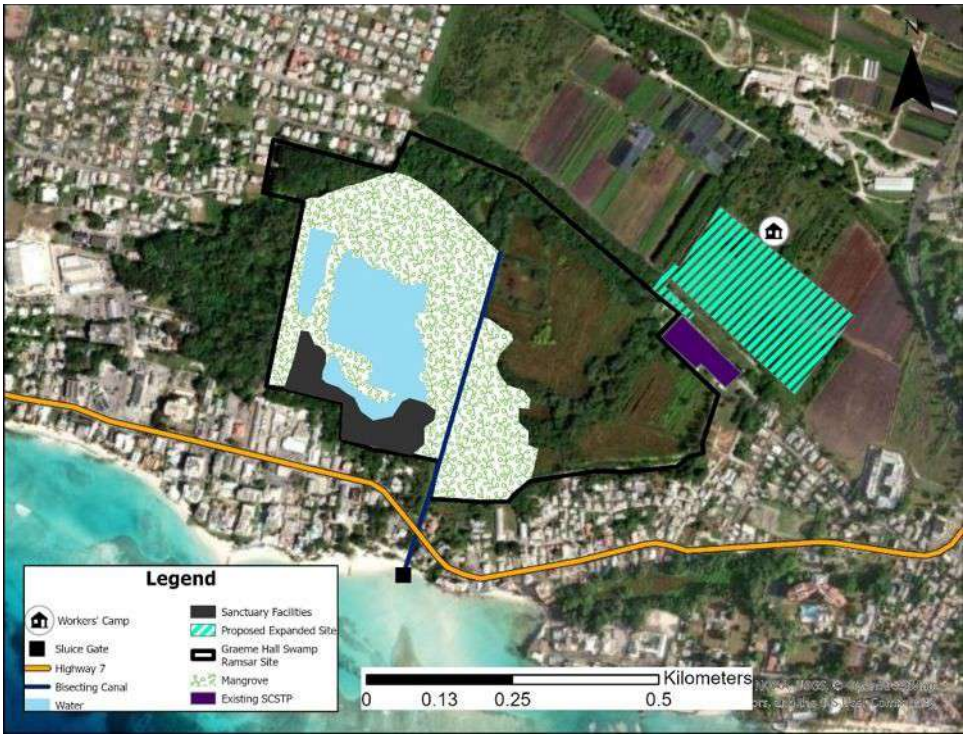


Figure 62: Project Habitat Interface & Functional Ecological Area Map

Based on the Project configuration assessed and the field verification undertaken, the Project footprint does not presently indicate direct occupation of wetland habitat. A physical separation between the Project area and wetland habitat was evident at station FV-01, and no wetland encroachment was identified.

The field verification confirmed that the Project's primary relationship to Critical Habitat is largely indirect and hydrological, stemming from its location within the watershed immediately upstream of the wetland and the interconnectedness of the Project area, Eastern Marsh, the internal wetland system, and the downstream coastal environment. The significant relationship is therefore the source and pathway connection created by the site's position within the watershed. Construction related runoff, sediment transport and changes to drainage are credible pathways by which Project activities could affect wetland receptors downslope. Additionally, direct disturbance or clearance of mature vegetation at the Project interface requires particular attention, as field verification confirmed the presence of lignum-vitae (*Guaiacum officinale*).

7.5.5. Status of Critical Habitat Findings and Design-Dependent Requirements

The Critical Habitat findings presented above reflect the Project information, ecological evidence and field verification available at the time of assessment. On this basis, the Project is not presently expected to result in significant conversion or degradation of the Critical Habitats. This conclusion is conditional, however, on the final Project design maintaining the avoidance and mitigation assumptions underpinning the assessment and on the effective implementation of the associated environmental management and monitoring measures.

The principal residual uncertainty is design-dependent and relates to hydrology and water management rather than to the Critical Habitat determination itself. Final design will need to confirm the function and configuration of relevant drainage and outflow infrastructure, wastewater and reclaimed-water conveyance arrangements, and the operational arrangements for the sluice/coastal outlet where these could influence wetland hydrology, water quality, salinity, drainage or downstream coastal pathways.

Accordingly, and consistent with the ESAP, the wetland risk assessment/Critical Habitat impact assessment will be reviewed and, where necessary, updated once final design information is available and prior to construction. The review will verify that the final design does not introduce direct wetland encroachment, material adverse changes to hydrological or water-quality conditions, new discharge pathways, or other impact pathways not assessed in the current CHA. Any material design change affecting these pathways will be subject to additional targeted assessment and corresponding mitigation before construction proceeds.

The current conclusion regarding the absence of significant conversion or degradation should therefore be understood as a conditional finding based on the presently available design and the implementation of the identified Critical Habitat safeguards, rather than as an unconditional conclusion applicable irrespective of final design.

The findings above rest on three different kinds of basis and carry different weight accordingly. Some are established on evidence already gathered and depend on no further decision. Some depend on design elements that are not yet final. And some are commitments to assess further before construction begins. The table below separates the three, so that a reader can establish for any finding whether it is settled, what it depends on, what must happen before it is confirmed, and who is accountable for that step.

Table 107 presents the status of the critical habitat findings, the design-dependent considerations and the commitments.

Table 107***: Status of the Critical Habitat findings, the design-dependent considerations and the commitments***

Finding or consideration	Status	Basis or dependency	Requirement before the finding is confirmed	Timing and responsibility
Graeme Hall Swamp is Critical Habitat and Critical Natural Habitat	Established	Criterion A is confirmed by designation as a Wetland of International Importance under the Ramsar Convention, Site No. 1591. Criterion B is confirmed by the hydrological and ecological connections through the Project and wetland interface. Criterion F is confirmed by the wetland's standing as the largest remaining mangrove, marsh and open water system of its type in Barbados	None. The determination rests on designation and on ecological evidence, and is independent of the final design	Settled at this assessment

Finding or consideration	Status	Basis or dependency	Requirement before the finding is confirmed	Timing and responsibility
Criteria C, D and E as potential triggers, with Criterion E held at high confidence	Established as potential	Species evidence recorded in the priority species screening and the field verification	These criteria do not affect the determination, which is established independently on criteria A, B and F. The associated species are retained as Key Biodiversity Features and as sensitive receptors for management and monitoring	Reviewed at the updated assessment
No direct conversion of Critical Habitat	Established for the present design	The footprint does not occupy or permanently convert Ramsar wetland or mangrove habitat, and field verification identified no encroachment at the Project and wetland interface	Confirmation that the final design introduces no encroachment within the wetland margin and no works within it	Updated assessment, before construction. Contractor designer, verified by the Project Execution Unit
No significant degradation of Critical Habitat	Conditional	The conclusion assumes the final design maintains the avoidance and mitigation assumed in this assessment, and assumes the Critical Habitat safeguards are implemented and their effectiveness verified through monitoring	Reassessment against the final design across the matters set out in the rows below, confirming whether the conclusion remains valid	Updated assessment, before construction. Project Execution Unit, reported to the Bank
Final drainage routing arrangements	Design-dependent	The routing was finalized on 9 October 2026 following the AECOM review. The outfall is on the southeast side of the plant area and discharges to the natural gully on the southeast side. The hydraulic capacity of the gully and its onward connection to the wetland drainage system are not established on measured data	Hydrological study covering flow, level, direction and seasonal variation, reconciled against the final drainage routing	Before the first discharge to the gully. Contractor designer, verified by AECOM

Finding or consideration	Status	Basis or dependency	Requirement before the finding is confirmed	Timing and responsibility
Future management of the existing wetland-to-coast outfall and conveyance system	Design-dependent and institutional	The conveyance runs southward through the wetland to the coastal outlet at Sandy Beach, with two pumping stations recorded at station FV-06, and it lies within the Core Critical Habitat Area. Decommissioning, retention and removal all remain open. The institutional responsibilities were confirmed by the Barbados Water Authority on 16 October 2026: the new forcemain from the plant to the Needham's Point marine outfall will be owned and operated by the Barbados Water Authority; the canal through which the existing conveyance runs will be maintained by the Ministry of Health, assisted by the Ministry of Transport and Works; the wetland will be managed by the National Heritage Unit of the Ministry of Environment; and operation of the sluice gate remains with the Drainage Unit of the Ministry of Transport and Works	A decision on the future of the conveyance, with a Critical Habitat review of the option selected before any works affecting it	Before any works affecting the conveyance. Barbados Water Authority with the Project Execution Unit, in consultation with the Ministry of Health, the Ministry of Transport and Works and the National Heritage Unit
Wetland water balance and salinity	Design-dependent	Hydrological measurements have not been undertaken, so statements on hydrological disturbance rest on field observation of drainage direction and on the published record	Assessment of the effect of the final drainage and conveyance arrangements on the wetland water balance and on the salinity regime, informed by the hydrological study	Updated assessment, before construction. Contractor designer with the ecological specialist
Ecological monitoring indicators and thresholds	Commitment	Monitoring requirements for Critical Habitat are carried at Annex F, and the framework for indicators, thresholds and corrective action applies across the Project at the monitoring and auditability provisions	Ecological indicators set for the wetland receptors with trigger thresholds, and baseline values established where measurement allows	Updated assessment, before construction. Incorporated into the consolidated monitoring program and the action thresholds

Finding or consideration	Status	Basis or dependency	Requirement before the finding is confirmed	Timing and responsibility
Characterization and assessment of residual impacts	Commitment	The residual ratings in this assessment assume the identified safeguards are implemented and effective, and several rest on a baseline with recorded limitations	Residual impacts characterized against the final design and against the completed baseline, with ratings revised where the evidence requires	Updated assessment, before construction. Project Execution Unit, reported to the Bank
Biodiversity Action Plan	Conditional requirement	A standalone plan is not required at this stage. The need for one depends on whether the updated Critical Habitat Assessment identifies impacts requiring management beyond the measures carried in this document	A determination recorded on completion of the updated assessment, and a plan prepared where that assessment shows it is required	On completion of the updated assessment. Project Execution Unit, in agreement with the Bank

How to read this table. The second column is the one to read first. An established finding is settled on evidence and does not change with the design. A conditional finding holds only while its conditions hold, and the fourth column states what must be done before it can be relied on. A design-dependent consideration is one this assessment cannot close because the engineering decision has not been taken. A commitment is work the Project has undertaken to do before construction. The distinction matters because the conclusion that the Project causes no significant degradation of Critical Habitat is conditional and is not an unconditional finding, and the rows marked design-dependent are the conditions on which it rests.

The wetland risk assessment and the Critical Habitat impact assessment will be reviewed and updated once final design information is available and before construction begins, which is the requirement carried in the Environmental and Social Action Plan for the Project. The review covers the final drainage routing arrangements, the future management of the existing wetland-to-coast outfall and conveyance system and the sluice gate operational arrangements, for which the institutional responsibilities confirmed by the Barbados Water Authority on 16 October 2026 are recorded in Section 3.1 and at PRJ-EI-14, the potential effects on wetland water balance and salinity, the ecological monitoring indicators and their thresholds, and the characterization of residual impacts. It will state whether the conclusion that the Project causes no significant conversion or degradation of Critical Habitat remains valid once those elements are settled, and where it does not, it will identify the additional measures required and the ratings that change.

A standalone Biodiversity Action Plan is not prepared at this stage; completion of the updated assessment, and of the Biodiversity Action Plan where it is required, is gate condition G-23 (Section 7.12). The Environmental and Social Action Plan provides for one where the updated Critical Habitat Assessment identifies impacts requiring management beyond the measures already carried in this document, and the determination is made on completion of that updated assessment against the finalized design. Until then the biodiversity commitments operate through the Critical Habitat

safeguards, the mitigation and monitoring requirements at Annex F, and the gate conditions governing works capable of affecting the wetland. No biodiversity offsets or compensatory measures are identified as necessary at this stage, and that position is itself revisited at the updated assessment.

7.6. Gender and Social Assessment

7.6.1. Executive Summary

The Gender and Social Assessment examines the potential social and gender-differentiated impacts associated with the construction, operation and eventual decommissioning of the Workers' Camp for the Barbados Climate Resilient South Coast Water Reclamation Project and Reuse Facilities. The assessment considers the characteristics of the Project workforce, surrounding communities and vulnerable or differentially affected groups and evaluates how project activities, labor influx and worker –community interactions may create unequal risks, impacts and benefits before, during and after the project.

The social context of the Workers' Camp is shaped particularly by the size, composition and mobility of the Project workforce. The camp is designed to accommodate 120 resident workers, all of them non-local and on fixed-term assignments, comprising 102 site workers and 18 management personnel, while the total planned project workforce is 252 and up to 203 persons may be present on site during a working day. The workforce is also predominantly male: only 21 of the 252 positions are held by women, representing approximately 8.3 percent of the workforce. The ESIA/ESMP consequently identifies labor influx and the interaction of a predominantly male and partly non-local workforce with nearby residential, commercial and community receptors as an important social and gender risk.

Main risks and priority groups at a glance. Five gender and social risks drive this assessment: sexual exploitation and abuse, sexual harassment and gender-based violence linked to a male, non-local resident workforce, which stays High after mitigation and carries the highest management priority; exclusion of women from Project employment and training, with 21 women among 252 positions and none in the construction trades; traffic, noise and dust falling on an older, predominantly female daytime population; disruption to informal women vendors and to women's access to services; and under-reporting by groups who do not trust or cannot reach the grievance mechanism. The priority groups are female-headed households (347, half of all households in the catchment), older women, working-age women renting privately, adolescent girls on the school route, women and girls in informal work in St. Lawrence Gap and along the community road, women with disabilities, migrant women and LGBTIQ+ persons, and the women working for subcontractors. What remains unknown is specific: economic activity, disability, country of birth and formality of work by sex at enumeration-area level; current rents; the number and sex of informal vendors; sex-disaggregated attendance at the virtual town hall; and how far women and girls in the catchment know of and trust the confidential GRM channel. Each gap has a closure route in Section 5.7 and an indicator in Table 192.

7.6.2. Introduction and Approach

The purpose of the Gender and Social Assessment (GSA) is to identify and assess the potential social and gender-differentiated risks, impacts and opportunities associated with the construction, operation and eventual decommissioning of the Workers' Camp for the Barbados Climate Resilient South Coast Water Reclamation Project and Reuse Facilities.

This GSA will be used specifically to evaluate who the Project employs, how the Project's impacts fall differently on women and men, youth, persons with disabilities, older persons, low-income and female-headed households, LGBTIQ people and other vulnerable groups from surrounding communities, what the project commits to in response, and what remains unknown, all of which may influence exposure, vulnerability and capacity to benefit from Project opportunities. It is the analytical counterpart to the previously presented Gender Monitoring Matrix.

The GSA is intended to ensure that social risks and benefits are not considered only at the aggregate population level. An impact that is minor or beneficial for the population generally may have a different significance for a group that is more exposed, has fewer resources to respond, experiences existing inequality or encounters barriers to accessing Project benefits, services, information or grievance mechanisms.

Accordingly, the assessment pursues the following objectives:

1. establish the relevant gender and social conditions within the Project Area of Influence and workforce;
2. identify vulnerable and differentially affected groups and the pathways through which Project activities may affect them;
3. assess the distribution of adverse impacts and beneficial opportunities across different groups;
4. identify measures to avoid, minimize and manage adverse impacts while promoting equitable access to Project benefits; and
5. establish gender-responsive and socially inclusive indicators through which Project performance can be monitored and corrective action taken where necessary.

The GSA therefore provides the analytical link between the Environmental and Social Impact Assessment (ESIA) Social Baseline, Community Health Assessment, Labor Management Plan (LMP), Stakeholder Engagement Plan (SEP), Social Management Plan (SMP), Grievance Redress Mechanism (GRM), Workers' Code of Conduct and SH/SEA/GBV Prevention and Response Plan, which are designed to meet survivor-centered, confidential and accessible standards consistent with IDB's ESPF including requirements on labor and working conditions, community health and safety, stakeholder engagement and gender equality.

The scope of the GSA therefore extends beyond the physical boundary of the Workers' Camp. It includes impacts arising through worker movement, public transportation and users, use of community infrastructure and services, interaction with community residents and local businesses, labor recruitment, economic activity, community health and safety, and other identifiable worker–community interfaces. The GSA addresses both adverse and beneficial impacts. Attention is given to employment and economic opportunities, labor influx, occupational segregation, working conditions, community health and safety, traffic congestion and pedestrian access impediments, community services, worker accommodation and welfare, discrimination, SEA/SH/GBV, grievance access and stakeholder participation.

7.6.3. Methodology

The Gender and Social Assessment (GSA) employs a mixed-methods approach combining quantitative data analysis, qualitative stakeholder engagement, and review of project documentation to evaluate the

differential impacts of the Project on various gender and social groups. The methodology is aligned with international best practice and the Inter-American Development Bank's Environmental and Social Policy Framework (IDB ESPF), ensuring compliance with requirements for gender equality, social inclusion, and community well-being.

Key components of the methodology include:

1. **Data Collection and Review:** The assessment draws on multiple data sources, including national census data, the Labor Management Plan, social baseline studies, community health assessments, and gender baseline reports collected as of August 2026. This wealth of information provides demographic profiles, workforce composition, and identification of vulnerable and marginalized groups within the Area of Influence.
2. **Stakeholder Engagement:** Participatory methods were used to capture the perspectives and experiences of vulnerable and affected communities and the Project workforce. Engagement employed various modalities proportionate to the sensitivity of issues, such as community meetings, focus groups, individual interviews, and targeted consultations with vulnerable groups (women, youth, persons with disabilities, older persons, migrant workers). Particular attention was given to confidential and survivor-centered approaches for sensitive matters related to sexual exploitation, abuse, and gender-based violence (SEA/SH/GBV).
3. **Social Risk and Vulnerability Analysis:** A Social Risk and Vulnerability Matrix was maintained throughout the project lifecycle to systematically identify, assess, and monitor social risks by severity, likelihood, exposure, and vulnerability across different groups. This matrix facilitates dynamic risk management and informs adaptive measures.
4. **Gender-Differentiated Impact Pathway Analysis:** The GSA maps specific Project activities against potential impact pathways, identifying how effects vary by gender and social group due to pre-existing inequalities, roles, and responsibilities. This includes analysis of employment patterns, livelihood disruption, access impediments, health and safety risks, and community interactions.
5. **Integration with Project Management and Safeguards:** The assessment is linked closely to broader Project frameworks, including the Labor Management Plan, Stakeholder Engagement Plan, Social Management Plan, Grievance Redress Mechanism, Workers' Code of Conduct, and SH/SEA/GBV Prevention and Response Plan. These instruments ensure that findings from the GSA are operationalized through concrete mitigation, monitoring, and reporting measures.
6. **Monitoring and Adaptive Management:** Gender- and socially disaggregated indicators were developed to track performance and effectiveness of safeguards throughout Project implementation. Adaptive management protocols allow continual improvement in response to monitoring results, stakeholder feedback, and changing conditions.

Indicators and disaggregation. The core disaggregated indicators used in this assessment and carried into monitoring are the ten listed in the gender baseline (Section 6.8.14) and the Gender Monitoring Matrix (Table 192). Disaggregation by sex is applied to every indicator, by age and disability to participation and grievance indicators, and by nationality to workforce and training indicators, using the categories of the 2021 Census so that Project data can be read against the baseline. The Social Risk and Vulnerability Matrix and the indicator set are reviewed quarterly by the Contractor's Social Personnel

with the Project Execution Unit, and in full at each annual review of the Labor Management Plan, with the review recorded in the quarterly social monitoring report.

7.6.4. Vulnerable Groups

The assessment recognizes that social impacts will not be experienced uniformly across the workforce or surrounding communities, hence an intersectional approach is required as it relates to gender, disability, age, poverty, migration status, employment status and other characteristics that increase exposure or reduce an individual's ability to avoid, report or recover from adverse impacts. The assessment therefore requires vulnerable groups to be considered not simply as separate demographic categories but in relation to the specific pathways through which Project activities may produce differentiated effects. Particular attention is required for women and girls, youth, migrant and non-local workers, PWDs, older persons, LGBTIQ+ persons, female-headed and low-income households and other vulnerable or marginalized groups. The assessment considers whether the person or group is more likely to come into contact with the Project-related risks or changes, and whether existing social, economic, physical or gender-related circumstances increase the potential consequences of exposure to the Project, and whether those most vulnerable have the resources, information, mobility, social support, services or other means required to avoid, respond to or recover from any impacts.

In the parish of Christ Church, female-headed households account for a significant share of the population, with 44% of households led by women. This group is consistently identified as vulnerable, given their higher prevalence of poverty compared to other household types. The demographic realities of female-headed households intersect with broader gender inequalities in the labor market, where women face barriers such as concentration in lower-paying sectors, disproportionate unpaid care responsibilities, and heightened risks of discrimination and gender-based violence. These factors underscore the importance of gender-responsive measures within the project’s design and implementation.

Persons with disabilities (PWDs) are also recognized as a vulnerable group across multiple national frameworks, including the Planning and Development Amendment Act (2020), the National Employment Policy (2014), the Employment Rights Act (2012), and various strategic health and development plans. Despite this recognition, persons with disabilities continue to face systemic barriers to decent employment, including discrimination, limited accessibility to training and workplaces, and rigid social assistance schemes that discourage transitions into employment. The project’s gender assessment explicitly incorporates persons with disabilities within its intersectional lens, ensuring that their needs are considered in both labor and community safeguards.

Migrant workers represent another vulnerable group, identified in policies such as the National Biodiversity Strategy and Action Plan (2020) and the National Employment Policy (2014). Migrants, particularly undocumented workers from other Caribbean and South American countries, are at heightened risk of exploitation, including practices such as document retention and restrictions on movement. Their presence is critical to filling labor force gaps, yet their vulnerabilities demand targeted protections to prevent abuse and ensure equitable treatment.

The broader demographic profile highlights the challenges faced by the elderly, particularly those with limited income or social support. Barbados’s aging population already with over 16% aged 65 or older and an age-related dependency ratio exceeding 50% is expected to grow further. Elderly individuals are disproportionately affected by health risks, including chronic conditions and increased vulnerability to

vector-borne diseases such as dengue. Policies such as the Barbados Strategic Plan for Health (2002) and the National Strategic Plan for the Prevention and Control of Non-Communicable Diseases (2020–2025) emphasize the need to address these risks, while the project assessment notes that health impacts may disproportionately affect older persons in the project area.

Taken together, these dynamics reveal a complex landscape of vulnerability in Barbados. Female-headed households, persons with disabilities, migrant workers, and elderly individuals with limited support all face distinct risks that intersect with broader demographic trends of aging, declining fertility, and labor market challenges. By explicitly recognizing these groups and embedding safeguards into project planning, the initiative can mitigate risks of exclusion, exploitation, and disproportionate harm, while promoting equitable access to opportunities and protections.

Local numbers. Counts for the groups above in the Direct Area of Influence, where the 2021 Census enumeration-area tabulations allow, are set out in Section 6.8.14 (Vulnerable groups with gender dimensions). Disability, country of birth and informal work are not tabulated by sex at this level and are recorded as gaps. For LGBTIQ+ persons no local data exist and none are sought, given the risk that collection itself creates; the relevant evidence is the national context of discrimination and the scope of the Employment (Prevention of Discrimination) Act 2020, which covers sexual orientation but not gender identity, so that discrimination against transgender workers is not covered by statute. Harassment of LGBTIQ+ workers or community members by Project personnel is therefore addressed through the Code of Conduct, whose non-discrimination clause covers both sexual orientation and gender identity, and through the confidential GRM channel. Each group maps to the impact pathways in Table 110: traffic and access for older residents, children and persons with disabilities; labor influx and SEA/SH/GBV for women and girls, informal women workers, migrant women and LGBTIQ+ persons; informal economy disruption for women vendors; and access to support services for every group that cannot reach Bridgetown unaided.

7.6.5. Identification and Assessment of Gender-Specific Impacts

This section identifies where Project effects fall differently on women and men, and why. The difference is rarely in the impact itself and almost always in the position of the person exposed to it: who travels on foot, who is at home during the working day, who carries responsibility for care and for securing water, who has access to the recruitment channels through which Project work is filled, and who bears the cost of reporting an incident.

Where the data allow, the distribution is quantified. Of the 685 employed residents of the four enumeration areas, 351 are women, concentrated in professional (91 of 135), clerical (43 of 53) and service and sales (56 of 85) posts, most of them serving the south coast tourism economy, while men hold 84 of the 90 craft and related trades posts (Table 44). Women are 53 percent of residents and 59 percent of those aged 65 and over, so the daytime population exposed to traffic, noise and dust is predominantly female (Tables 39 and 41). In the Project workforce women hold 21 of 252 posts, all but one through local subcontractors (Tables 108 and 109). The gender composition of businesses is not yet established: the field exercise recorded small business activity in the catchment but did not enumerate businesses, their formal or informal status, or the sex of owners and workers, and informal vendors along the community road and in St. Lawrence Gap have not been counted. A short census of businesses and vendors within the 1 km catchment, recording formal or informal status, the sex of owners and workers and dependence on passing trade, will be completed before construction begins and used to target the

access and notification measures of the Traffic and Pedestrian Management Plan and the Social Management Plan.

7.6.5.1. Traffic Congestion and Access Impediments

The ABC Highway, identified as a vital road infrastructure and major artery across the south coast, will be significantly impacted during the construction of the SCSTP upgrade and the SCWRRF. This corridor connects critical destinations including the airport, capital city, university, businesses, and tourism hubs, making uninterrupted access essential for daily operations and emergency services.

Stakeholders emphasize that highway access is vital for deliveries, client accessibility, and public transport operations. The project is expected to cause blockages and delays along the highway, with particular disruption to scheduled bus routes and the Oistins' Terminal, a key transport hub. Poor traffic management during construction could restrict access to essential services, businesses, and cultural/heritage assets throughout the project area.

The socio-economic implications are broad:

- **Public transport users**, especially lower socio-economic groups, will face longer commute times, increased costs, and reduced productivity.
- **Commercial deliveries** will be delayed, affecting supply chains and regional economic activity.
- **Emergency services** such as ambulance access, gas, and electricity supply could be compromised, posing serious safety and health risks, particularly for vulnerable populations (e.g. elderly in nursing homes).

7.6.5.2. Community Health and Wellbeing

Potential social impacts extend beyond traffic congestion and pedestrian safety. The impact of noise and disturbance, pressure on utilities and health services, safety and security, communicable disease, inflationary pressures and other consequences associated with workforce presence and project activities are also to be considered. The ESIA recognizes community health and safety as a significant component of the assessment and specifically considers vulnerable and differentially affected groups, environmental and socioeconomic determinants of health and cumulative impacts. These impacts may also have gender-differentiated consequences. Noise, traffic, dust, worker movement and construction activity may also affect community well-being. Daytime disturbance may disproportionately affect people who spend greater amounts of time within the home or community, including caregivers, young children, older persons, persons with disabilities and persons who work from home. Pressure on community health and other services associated with workforce influx may also have differential implications for persons with disabilities and the elderly who rely more frequently on these services. Women may experience indirect impacts where they are primary users of reproductive and primary health services or undertake a disproportionate share of household care. Persons with disabilities, older persons and low-income households may also have fewer alternatives when services become constrained.

7.6.6. Gender and Social Vulnerabilities

The construction of the SCSTP upgrade, the SCWRRF and the workers' camp intersects with existing gender inequalities in Barbados, creating disproportionate burdens for women and amplifying vulnerabilities in informal livelihoods.

7.6.6.1. Disproportionate Burden on Women – Time Poverty and Care Work

Women in Barbados already experience time poverty due to their disproportionate responsibility for domestic tasks and caregiving. Project-induced traffic congestion will increase commute times, leading to time loss that cascades into reduced productivity and greater care burdens. Environmental nuisances such as dust from construction will require women to redo household chores like laundry, adding to their unpaid workload. Health risks, including increased mosquito populations and vector-borne diseases such as dengue, further compound this burden, as women are often the primary caregivers for sick family members. Interruptions in water supply or contamination also disproportionately affect women, who are responsible for maintaining household hygiene. These impacts reinforce existing inequalities, limiting women's ability to engage in income-generating activities, pursue education, or participate in community life.

7.6.6.2. Intersectionality and Compound Vulnerabilities

Women workers often face exclusion through ill-fitting PPE, harassment, and lack of privacy, but when these gendered risks intersect with migrant status or disability, the vulnerabilities compound into systemic barriers to safety and participation. Migrant workers, already exposed to exploitation and language barriers, experience heightened SEA/SH risks in informal community "hotspots," particularly for women and girls. Persons with disabilities encounter inaccessible facilities and exclusion from training, and when disability overlaps with gender or age, the marginalization deepens. Female-headed households carry the dual burden of poverty and unpaid care, leaving them more exposed to SEA/SH/GBV and economic shocks, especially when combined with disability or migration. Older persons, particularly women in low-income and otherwise disadvantaged households, face compounded health, mobility and displacement risks. These overlapping vulnerabilities converge in community risk zones such as residential areas near campsites, school corridors along narrow access roads, and informal vending locations, where harassment, traffic hazards, and exploitation are concentrated. Addressing these requires tailored safeguards: gender-sensitive occupational health measures, multilingual and accessible communication, infrastructure adapted for persons with disabilities, confidential grievance mechanisms, and community-level protections such as lighting, patrols, and traffic calming. By analyzing how risks intersect, the ESIA can move beyond generic safeguards to deliver responses that are both inclusive and context-specific, ensuring that compounded vulnerabilities are mitigated through proactive, intersectional design.

7.6.6.3. Vulnerability of Women in Informal Livelihoods

Informal livelihoods in the Area of Influence are carried on by vendors, fishers and small operators whose income depends on physical presence at a particular location, and who are exposed to any restriction on access to it. Women are over-represented among those whose trade depends on passing custom, and the consequences of an access restriction fall differently on them. Where a woman is the sole earner in her household, a period of lost trade carries through to household food security, to the capacity to meet health costs and to income stability, and the time cost of re-establishing trade at an alternative location falls on a working day already constrained by care responsibilities. Fishers recorded at station FV-02 using the wetland are exposed on the same basis.

The effects assessed in this document are those arising from the works it covers, being access restriction, congestion, nuisance and loss of coastal and beach amenity during construction at the two facilities. They are assessed at the livelihood and amenity pathways for both facilities, and the controls are maintained access with alternatives agreed in advance, advance notice of works affecting access,

verification of vendor and fisher access at each monthly site inspection, and a distinct grievance category for income-loss claims, tracked monthly and disaggregated by sex and by vendor, fisher and accommodation-provider status.

Vendors operating along the ABC Highway corridor are affected by the reclaimed water pipeline delivered under Component 2, and not by the works assessed in this document. Those effects, together with any physical or economic displacement arising from them, are assessed under the Environmental and Social Assessment and Management Plan for the pipeline, which carries a Livelihood Restoration Plan to be completed and implemented before pipeline construction begins. They are excluded from this assessment so that the two instruments do not give differing accounts of the same persons.

7.6.6.4. Vulnerability of persons with disabilities and Older Persons

Accessibility remains one of the key challenges for persons with disabilities and older persons. Persons with disabilities and older persons may experience heightened vulnerability to project-related impacts because of reduced mobility, health conditions, greater dependence on community services, limited access to transportation, or difficulty adapting to changes in their physical and social environment. These factors may increase their exposure or sensitivity to construction-related disturbance and reduce their capacity to avoid or respond to adverse impacts.

Traffic and pedestrian safety represent a particular consideration. Increased movement of project vehicles and workers may create additional risks for persons with disabilities and older pedestrians, particularly those with reduced mobility, visual or hearing impairments, or those who require more time to cross main roads and navigate changes in pedestrian routes. These groups may also be more sensitive to noise, dust and other construction-related disturbances, particularly where they spend significant periods within their homes, health facilities or have underlying health or mobility limitations. Changes in access routes, temporary obstruction of pedestrian areas or increased traffic may further affect their ability to access shops, health facilities, public transportation and other essential services, making it difficult to maneuver their day to day lives. Hence, people with mobility impairments may have difficulty navigating temporary changes to roads, footpaths, crossings or access routes. People with visual or hearing impairments may face additional safety risks where traffic patterns change or where warning systems and Project communications are not provided in accessible formats. Others with intellectual, developmental or psychosocial disabilities may encounter different communication, participation or support requirements.

Commitments for each vulnerability. Time poverty and care work: heavy vehicle movements are restricted at school travel times and the 14:30 restriction applies on school days; closures and diversions are notified at least seven days in advance through the channels in Section 7.6.9 (Traffic and Pedestrian Management Plan, Section 8.4.6; indicator: traffic grievances by sex). Women in informal livelihoods: vendors identified in the pre-construction business and vendor census are notified directly at least seven days before any works affecting their location, access to their pitch is maintained or an alternative agreed with them, and livelihood grievances are tracked as a distinct category by sex (Social Management Plan, Section 8.4.15; indicator: livelihood grievances by sex and vendor status, reviewed monthly). Persons with disabilities and older persons: temporary routes are accessible and level, crossings are marked and attended at peak times, and information is available in large print, audio and through home visits on request (Traffic and Pedestrian Management Plan; SEP; indicator: accessibility grievances). Intersecting vulnerabilities of women, migrant and disabled workers: properly fitting PPE, separate facilities and reasonable accommodation are verified at each monthly workforce inspection

(Labor Management Plan, Section 8.4.7; HSE Management Plan, Section 8.4.13.22; indicator: inspection findings and worker grievances by sex and nationality).

7.6.6.5. Occupational Segregation within the Project

Disaggregating by role shows where women are and are not employed. Women hold posts in ten of the twenty-four roles identified, and those posts are concentrated in professional, technical and service functions rather than in construction work.

Table 108 presents the roles employing women, by female share.

Table** 108**: Roles employing women, by female share

Role	Total posts	Women	Female share
Legal services	1	1	100%
Financial services	1	1	100%
ESIA/ESMP specialists	7	5	71.4%
Customs clearance officers	3	1	33.3%
Water quality testing, laboratory technicians	7	2	28.6%
Material testing, laboratory technicians	8	2	25.0%
Landscaping works	20	5	25.0%
Material supply, ready-mix concrete and masonry	22	2	9.1%
Temporary water supply, engineers and technicians	11	1	9.1%
Project management personnel	18	1	5.6%

Table 108 sums to twenty-one women, the figure confirmed in the Contractor's Labor Management Plan and used throughout this document.

Table* 109*: Roles employing no women

Role	Posts
Chinese skilled trades: reinforcement, carpentry, concrete	35
Chinese semi-skilled: general workers and site assistants	15
Chinese skilled: electrical, mechanical and instrumentation	15
Material supply: aggregate and construction equipment	15
Road works	15
Chinese skilled trades: finishing	10
Material supply: building materials and hardware	10

Role	Posts
Fire protection works	10
Truck drivers	8
Geotechnical engineers and drilling	6
Temporary power supply, engineers and technicians	6
Chinese skilled: drivers	5
Survey engineers and surveyors	3
HSE Officer	1
Total	**154**

One hundred and fifty-four posts, being 61.1 percent of the entire workforce, sit in roles that employ no women at all. Those roles are the skilled and semi-skilled construction trades, plant operation, haulage, survey and materials supply. The pattern is consistent with the national picture described in the baseline, in which women are concentrated in hospitality, retail and the care economy and under-represented in construction, but the project reproduces that pattern rather than moderating it. Where women are employed, it is overwhelmingly in professional and technical services procured from outside the construction trades, and in landscaping.

This finding has a direct consequence for the assessment. Job creation is recorded as a beneficial impact in the Social Impact Assessment Matrix, and the benefit is real, but on the present composition it accrues to men in roughly eleven cases out of twelve. Any statement that the project creates employment opportunities for the community should be qualified accordingly, and the commitments below are directed at changing the distribution rather than restating the benefit.

Targets for women's access. To move the employment benefit beyond diagnosis, the following targets are proposed for adoption by the Contractor in the Labor Management Plan: women to hold at least 30 positions (12 percent) by peak construction, against 21 (8.3 percent) at present; at least ten of those positions to be in technical, supervisory or trade roles currently held only by men; at least 20 percent of Project-funded training and apprenticeship places in the construction trades reserved for women; and women to make up at least 40 percent of shortlisted candidates for locally recruited non-trade posts. Progress is reported monthly against Table 192 and reviewed at each annual review of the Labor Management Plan, with corrective measures where a target is not on track. The targets are proposed by SAEDI and are to be confirmed by the Contractor before mobilization.

7.6.7. Gender-Differentiated Impact Pathways

Each of the impacts assessed in the Social Impact Assessment Matrix carries a gender dimension. Table 110 records how the impact falls differently on women and men, and the instrument through which the difference is managed.

Table** 110**: Gender dimension of assessed impacts

Impact	How it differs by gender	Managed under
Labor influx and community interaction	A workforce that is 91.7 percent male, housed adjacent to a residential community, is the principal driver of sexual harassment, exploitation and gender-based violence risk. Women and girls in the community bear that risk; workers do not. Adolescent girls on the school route, women working informally in St. Lawrence Gap, migrant women in domestic and hospitality work and LGBTIQ+ persons are the most exposed and the least likely to report.	SH/SEA/GBV Prevention and Response Plan; Code of Conduct; indicator: SEA/SH/GBV grievances and case handling (Table 192)
Traffic and pedestrian safety	Women are more likely to travel on foot along the community road, accompanying children to school and carrying goods, and are therefore more exposed to heavy vehicle movement than car-borne road users. Older women and persons with disabilities, who need more time to cross, and adolescent girls walking to school are the most exposed.	Traffic Management Plan; restricted movement windows; indicator: traffic grievances and incidents by sex and age
Job creation	The benefit accrues to men in eleven of twelve posts. Women's access is limited by occupational segregation, by recruitment routes that do not reach them, and by unpaid care responsibilities that constrain availability. Older women and women with disabilities face added barriers to recruitment and training.	Labor Management Plan; the commitments below; indicator: women's share of positions by skill level and training places by sex (Table 192)
Inflationary pressure on food, fuel and rents	Price pressure falls hardest on the lowest-income households, which in Barbados are disproportionately headed by women. Working-age women renting privately (44 female heads aged 25 to 49) and older women on fixed incomes are the most exposed.	Local procurement; price and rental baseline; indicator: median rents and female-headed and renter households (Table 192)
Pressure on health services	Women are the principal users of primary and reproductive health services and the principal carers when household members fall ill, so service strain transfers to them twice over. Older women and women with disabilities, the most frequent users, have no 24-hour service within the catchment.	Community Health Plan; indicator: health-related grievances by sex
Water supply pressure	Where supply is interrupted, the burden of securing and carrying water falls disproportionately on women within the household. Older women living alone, without storage or help to carry water, are the most exposed.	Camp self-sufficiency; consumption monitoring; indicator: supply interruptions and related grievances by sex
Noise and disruption to daily activity	Disturbance during the day falls on those at home, who are more often women, older persons and young children. Older women, persons with disabilities and young children at home during the day are the most exposed.	Working hour restrictions; Noise Management Plan; indicator: noise grievances by sex and age
Worker accommodation and welfare	Twenty-one women work in a Project workforce of 252, one of them resident in the camp. Sanitation, security and privacy provisions determine whether that is safe.	Workers' Health and Safety Plan; welfare provisions; indicator: inspection findings and security incidents (Table 112)
Grievance and reporting	Women are less likely to use a public complaint route, and more likely to use a confidential one. A single undifferentiated channel will under-record women's complaints. Migrant women, LGBTIQ+	Grievance Redress Mechanism; confidential SH/SEA/GBV channel;

Impact	How it differs by gender	Managed under
	persons and adolescents are the least likely to use either.	indicator: GRM awareness and trust by sex (Table 192)

7.6.7.1. Key Risks and their Gender and Social Implications

The risks below are the ones on which the gender and social analysis turns. They are not a separate risk register: each corresponds to a pathway assessed in the Social Impact Assessment at Sections 7.1 to 7.3, and what is recorded here is the gender and social dimension that the impact table summarizes in a single line.

Two of them warrant the emphasis they receive. Sexual exploitation and abuse, sexual harassment and gender-based violence retains a High rating after mitigation and the highest management priority, because preventive measures reduce the frequency of the conditions in which incidents arise but do not reduce the severity of an individual incident. And the distribution of employment benefit is treated as a risk rather than only as a benefit, because on the present workforce composition the benefit accrues to men in approximately eleven cases in twelve.

7.6.7.2. SEA, SH and Gender-based Violence

Project risk statement. Because the Project houses up to 120 non-local, almost entirely male workers about 250 m from Harmony Hall and within walking distance of St. Lawrence Gap, for some three years, there is a risk that Project workers sexually exploit, abuse or harass women, girls and other community members, or female workers on site, through transactional sex, harassment on the community road and at bus stops, shops and beaches, and exploitation of informal and migrant women workers. The risk is rated Critical before mitigation and High after (Section 7.6.8), because the consequence of an incident remains severe however well its likelihood is controlled. It is managed through the Code of Conduct, the SH/SEA/GBV Prevention and Response Plan, camp access and movement rules, and the confidential GRM channel with referral to the services in Table 111, and monitored through the SEA/SH/GBV indicators in Table 192. The national context that follows explains why the risk is high; it is not a substitute for the controls.

The project documentation highlights a range of labor-related risks, particularly around exclusion, unequal treatment, and vulnerabilities affecting women, persons with disabilities (PWDs), youth, and migrant workers. Labor in Barbados is segmented, with men having greater access to work-related opportunities than women. Women are more likely to be employed in wholesale and retail, accommodation and food services, and shop-based sectors, which makes them disproportionately affected by project impacts such as transit disruption. This segmentation also extends to persons with disabilities, who face barriers to employment due to discrimination, limited accessibility, and rigid social assistance schemes that discourage transitions into work.

Sexual harassment and exploitation present another serious risk. Barbados has a documented culture of public sexual harassment, and the concentration of men at construction sites can heighten risks of GBV. Barbados has a known issue with persistent street harassment. The likely increase in pedestrian traffic due to construction activities and the presence of work crews, who may see or interact with community members, could lead to an increase in street harassment, a form of GBV affecting women. The concentration of men in construction projects can lead to increased levels of GBV. Projects employing larger proportions of men than women may leave women financially vulnerable, increasing

susceptibility to sexual exploitation. Female professionals, such as engineers, also face risks of harassment and assault on job sites. These concerns are formally acknowledged in the Sexual Harassment (Prevention) Act, underscoring the need for strong safeguards.

Child labor is an additional concern, particularly for casual and day laborers during project delays. The proximity of schools raises the risk of boys as young as 15 being informally hired for construction or day labor, which constitutes exploitation and is flagged under Labor and Working Conditions safeguards. The control is age verification against official documents for every worker, including those hired by subcontractors or as day labor, with a Register of Young Persons (Labor Management Plan, 8.4.7.4). Engagement with St. Luke's Academy and St Lawrence Primary School covers the prohibition, and any report of a child working on or near the sites can be made through the GRM, including anonymously, and is escalated immediately to the HR Representative and the child protection authorities under the Code of Conduct.

Health and safety risks are also significant. Workers face potential injuries from improper or faulty machinery use, inadequate protective gear, and unsafe practices in construction zones. Deep trench work poses risks of collapses, falls, or engulfment by soil or water, while heat stress and strokes are concerns for those working in unshaded areas. The documentation emphasizes the importance of PPE, safety kits, and trained first-aid personnel to mitigate these risks. Construction activities can lead to interruptions in water supply or contamination by dust and other pollutants. These impacts can disproportionately affect women and girls, who are often responsible for domestic chores and maintaining household hygiene. Dust pollution can also exacerbate health issues for children and elderly parents, increasing the workload of caregivers.

Many informal vendors are women and heads of households. Construction activities, such as road closures or traffic diversions, can disrupt their access to customers and negatively impact their livelihoods, potentially making them and their families more vulnerable to exploitation.

Although unsafe accommodation is not explicitly detailed, broader social impacts are noted. Migrant workers, often a largely male workforce away from families, can affect community cohesion and contribute to gender-based social impacts. Unequal treatment is also a recurring issue, with discrimination based on race, gender, ethnicity, religion, disability, or sexual orientation leading to violence or unfair treatment. Gender pay gaps persist, with women likely to earn less than men for comparable work, and female workers may be rejected for jobs or given fewer assignments due to sex, pregnancy, or childcare responsibilities. Migrant workers are disproportionately exposed to “Decent Work deficits,” concentrated in insecure, low-paid work such as construction and domestic labor, often without awareness of their rights.

General disregard for workers’ rights compounds these risks, including denial of PPE, basic amenities such as gendered washroom facilities, shelters, drinking water, and rest days, as well as delayed or denied remuneration. Worker influx into communities further exacerbates risks of sexual exploitation, harassment, and GBV. In socio-economic settings with existing gender power imbalances, labor influx can intensify trafficking, sexual exploitation, and violence against women and girls. The presence of a largely male, non-national workforce away from families can also lead to unplanned pregnancies, female-headed or low-income households, and disruptions to community cohesion.

To address these risks, the project proposes a comprehensive set of mitigation measures. These include educating workers on Barbados’s laws regarding sexual and gender-based violence, implementing a

Workers' Code of Conduct with mandatory safeguards, and conducting regular training on GBV, gender inclusion, and workplace harassment. Monitoring mechanisms, a community Grievance Redress Mechanism, and cooperation with law enforcement are also planned. Worker contracts will include harassment clauses, and policies will be developed to prevent sexual harassment of community members, particularly women and girls. These measures aim to ensure fair treatment, protect vulnerable groups, and strengthen community resilience against labor-related risks.

7.6.8. Labor Influx Risk Screening

The Labor Influx Risk Screening assesses this risk at likelihood 3 and consequence 5 before mitigation, and at likelihood 2 and consequence 5 after mitigation. On the risk matrix at Section 5.3 the residual score is 10, which is High, consistent with PRJ-SI-03. The screening's pre-mitigation likelihood of 3 gives Very High, against the likelihood of 4 and the Critical rating applied at PRJ-SI-03, and the difference is recorded rather than reconciled. The consequence score does not fall because harm to a survivor cannot be undone; only the probability of occurrence can be reduced. It is the highest-rated community risk the Project carries, and it remains a priority risk for the life of the works.

The screening identifies seven drivers: a large and predominantly male workforce; the presence of up to 120 non-local resident workers; worker movement and interaction within the surrounding communities; economic power imbalances between workers and residents; the exposure of women, girls, children, older persons, persons with disabilities and lower-income households; under-reporting caused by language difference, fear of retaliation, stigma and limited awareness of reporting routes; and the concentration of risk during the peak construction period from the third quarter of 2027 to the fourth quarter of 2028, with deployment reaching 203 workers in the third quarter of 2028.

Twelve minimum controls follow from the screening and are implemented through the Environmental and Social Management Plan. They cover Code of Conduct signature as a condition of site access, mandatory induction with quarterly refreshers, written material in English and Standard Chinese with spoken interpretation, a worker-community interaction protocol, confidential and anonymous reporting held separately from the general grievance log, a verified survivor referral directory, community awareness before mobilization and six-monthly thereafter, supervisor accountability, a restricted-access case register, disciplinary sanctions, monthly and quarterly monitoring, and the prohibition on any sexual activity with a person under 18.

Obligations of this kind reach the workforce only if they reach the subcontractors. Transport, catering, waste collection and construction support will be delivered by subcontracted firms, and the Inception Report identifies the cascade of obligations to those firms as an open gap: the requirements of the Labor Management Plan and the Workers' Code of Conduct are not yet written into subcontract terms. For this assessment the position is that every control expressed as binding on the Contractor is binding on its subcontractors, that adherence is to be documented in the subcontract, and that compliance is to be audited rather than assumed. Without that cascade the controls in this document apply to a minority of the people who will be on site.

Commitments on subcontract cascade and language. To close the two gaps identified above, the Contractor will: write the Workers' Code of Conduct, the Labor Management Plan requirements on recruitment, wages, hours, accommodation and grievance access, and the SH/SEA/GBV Prevention and Response Plan into every subcontract and supply contract as binding terms, with the right to audit and to remove personnel, before any subcontractor mobilizes; require each subcontractor to name a focal

point for labor and SH/SEA/GBV matters; issue the Code of Conduct, worker declaration, induction material, grievance information and camp rules in Standard Chinese and English, with verbal interpretation at induction and toolbox talks; and verify understanding through a short signed comprehension check at induction. Compliance is checked monthly through the subcontractor labor compliance checklist in the Labor Management Plan and reported to the Project Execution Unit. The Chinese-language worker declaration is a condition of camp occupation.

The Labor Management Plan for the wider project supplies the instruments through which these obligations are evidenced rather than merely stated. It carries thirteen implementation templates, among them the worker induction checklist, the Code of Conduct acknowledgment form, the labor influx risk monitoring checklist, the worker grievance intake form, the confidential referral log for sexual exploitation and harassment cases, the accommodation inspection checklist, the subcontractor labor compliance checklist, the training attendance register and the incident and corrective action tracker. The camp's monitoring obligations under this assessment should be discharged using those templates so that a single evidence trail serves the camp, the treatment plant and the reclamation facility, and so that the subcontractor compliance checklist becomes the mechanism by which the cascade described above is audited.

Language is the other condition of enforceability. The Code of Conduct requires worker-facing documents in the native language of the worker, and all 120 resident workers are Chinese nationals. The Chinese-language worker declaration had not been provided at the time of the July 2026 document review, which means the instrument that carries the signature has not been available in the language of the majority of those signing it. Induction, refresher training, the grievance posters and the confidential reporting routes are subject to the same requirement. A signature on a document a worker cannot read is not informed consent and would not withstand scrutiny in a disciplinary process or a Bank review.

The national context makes these controls necessary rather than precautionary. The National Intimate Partner Violence survey, commissioned by Jabez House, funded by the European Union and conducted by DB Research Services across 515 respondents, found that 62 percent of women in Barbados have experienced at least one form of intimate partner violence, with emotional abuse most prevalent at 37 percent, social isolation at 25 percent and physical violence at 22 percent, and 46 percent of respondents reporting more than one category of abuse. Officials and advocates consider that figure an underestimate given the level of non-disclosure. The regional comparator from population-based surveys by UN Women, the Inter-American Development Bank and the Pan American Health Organization is approximately 30 percent of ever-partnered women in the Caribbean reporting physical or sexual intimate partner violence in their lifetime. The two figures are not in conflict: the national survey covers all women and counts any form of intimate partner violence including emotional abuse and social isolation, whereas the regional figure covers ever-partnered women only and counts physical or sexual violence. Both are cited here because the assessment should not rest on the lower of the two. Barbados scores between 0.73 and 0.75 on the World Economic Forum Global Gender Gap Index. The Employment Sexual Harassment (Prevention) Act, 2017 requires employers to maintain zero-tolerance harassment policies, formal grievance procedures and civil liability measures, and the Domestic Violence (Protection Orders) Act as amended in 2016 broadens police intervention powers and the availability of protective orders.

7.6.9. Stakeholder Engagement and Social Inclusion

Stakeholder engagement is an integral component of the GSA and will be undertaken throughout the Project lifecycle to support the identification, management and monitoring of social and gender-related risks and impacts. Meaningful engagement provides an important mechanism for understanding community experiences and perceptions, identifying emerging concerns, validating assessment findings and determining whether mitigation measures are effective.

The approach to stakeholder engagement recognizes that stakeholders are not a homogeneous group and that individuals may have different levels of interest in, influence over and exposure to the Project. Gender, age, disability, socioeconomic status, nationality, migration status and other social characteristics may influence an individual's ability to access Project information, participate in consultations, express concerns or use Project grievance mechanisms. Stakeholder engagement will be inclusive, accessible, culturally appropriate, ongoing and responsive to the circumstances of potentially affected stakeholder groups. Attention will be given to persons who may be vulnerable, marginalized, underrepresented or differentially affected by Project activities, inclusive of women, men, persons with disabilities, older persons and others.

Stakeholder identification will consider individuals, vulnerable groups and institutions that may be directly or indirectly affected by the Workers' Camp or that have an interest in Project implementation and its gender and social outcomes. Relevant stakeholders include Project workers and subcontractors; migrant and non-local workers; residents of surrounding communities; women and girls; men and boys; older persons; persons with disabilities; lower-income and female-headed households; local businesses and vendors; community organizations and leaders; women's organizations; youth groups; organizations representing PWDs; civil society organizations; GBV support and referral service providers; health services; and relevant government and service agencies.

Stakeholder identification will be reviewed throughout implementation because the composition of affected stakeholders and their level of exposure may change as workforce numbers, construction activities, worker movement and community interaction patterns change. The stakeholder identification and mapping process supports compliance with IDB ESPS 10 on Stakeholder Engagement and Information Disclosure. Engagement methods will be adapted to the needs and circumstances of each stakeholder group. The identification process will also consider stakeholders who are underrepresented and may not be highly visible through conventional consultation and feedback processes. There will be a focus on individuals and groups who may be less likely to attend public meetings, respond to written notices or raise concerns through formal channels due to accessibility challenges.

Stakeholder identification in this assessment distinguishes (i) primary/project-affected stakeholders, including households within the direct area of influence, residents near access roads, businesses, farmers, workers and communities next to the treatment plants and workers' camp; (ii) secondary stakeholders, including persons and organizations with indirect interests such as civil-society groups and the wider water-user population; (iii) internal stakeholders, including CRSEG staff, subcontractors, camp management, BWA/PEU and project implementation personnel; and (iv) external stakeholders, including nearby residents, community representatives, farmers, public agencies, service providers and civil-society organizations. These classifications are functional and may overlap. Table 156 provides the stakeholder assessment matrix; Figure 74 illustrates stakeholder relationships. The stakeholder register should record each identified group, location, risk exposure, accessibility requirements, contact method and engagement outcome.

7.6.9.1. Engagement with Vulnerable and Differentially Affected Groups

Engagement designed for the general population does not reach the groups most exposed to Project effects, and an engagement record showing broad attendance is not evidence that it has. The arrangements below are therefore designed around the specific barriers that keep particular groups out of a general process: timing that conflicts with paid work or care responsibilities, venues that are not accessible, language barriers, the cost of travel, and the reasonable expectation that raising a concern publicly carries a consequence.

The test applied throughout is whether a group has been reached rather than whether it has been invited. Where monitoring shows that a group is not participating or not using the grievance channels available to it, that is treated as a finding requiring a change in method, not as a preference on the part of the group.

12.6.1.1 Gender- and Social-Responsive Engagement

The Project recognizes that providing stakeholders with the same opportunity to participate does not necessarily result in equitable or meaningful participation. Even though identified and included, vulnerable stakeholder groups experience barriers that reduce their visibility and ability to access information, attend consultations, communicate concerns or influence Project decisions. A comprehensive risk assessment will be done before any engagement activity, to protect participants from potential backlash. Sensitive cases will be managed using a survivor-centered approach and legal obligations in Barbados.

Engagement will therefore consider the specific participation needs of women, youth, older persons, PWDs, lower-income and female-headed households, migrant and non-local workers and other groups identified through the GSA as potentially vulnerable or differentially affected. Potential barriers may include physical accessibility, transportation, meeting location and timing, caregiving responsibilities, language and literacy, disability, limited access to digital communication, discomfort speaking in mixed groups, fear of retaliation, concerns regarding confidentiality and limited awareness of Project engagement processes.

Where these barriers are identified, targeted engagement measures should be applied. These may include accessible consultation venues; appropriate scheduling taking into consideration women's care responsibilities; smaller or separate group discussions; individual interviews; multiple communication formats; language support; reasonable accommodation for persons with disabilities; engagement through trusted community organizations and representatives; and confidential mechanisms for communicating sensitive concerns.

The purpose of targeted engagement is not to treat vulnerable groups as homogeneous or passive beneficiaries, but to ensure that they have meaningful opportunities to provide information, identify risks, propose mitigation measures and influence Project decisions that may affect them.

Gender considerations will be integrated throughout stakeholder engagement. The Project will seek meaningful participation by women as well as men, youth, persons with disabilities, older persons and other vulnerable stakeholders, and will assess whether they face barriers to accessing information, attending consultations or expressing concerns. Where appropriate, separate consultations or smaller discussions will be considered, particularly for issues relating to personal safety, worker-community interaction, SEA/SH/GBV, employment, access to services and grievance mechanisms.

The timing and location of engagement activities will consider household and caregiving responsibilities of women and girls which often affect their availability and accessibility. Engagement should also avoid

assuming that the views of community leaders, household heads or other representatives necessarily reflect the experiences, priorities and vulnerabilities of residents within the same community. Participation should therefore be assessed not simply according to the number of women, men, youth, etc attending engagements but also according to the extent to which they are able to raise issues, contribute to discussions and influence Project responses.

For the meaningful participation of persons with disabilities and older persons, consultation venues should, where feasible, be physically accessible and located so that participation does not impose unnecessary mobility or transportation barriers. Alternative engagement methods should be considered where individuals cannot readily attend community meetings. Communication should also consider the needs of persons with visual, hearing, mobility or other disabilities. Where required, reasonable accommodation should be provided to facilitate participation and access to Project information.

Engagement with organizations representing persons with disabilities and other relevant community organizations or vulnerable people may assist the Project in identifying accessibility barriers and appropriate mitigation measures. For older persons, engagement should consider their mobility limitations, access to transportation and digital information, and reliance on community health and other services. Alternative methods such as individual or small-group engagement for these groups of people may also be appropriate where conventional public meetings create participation barriers.

7.6.9.2. Engagement with Migrant and Non-Local Workers

Migrant and non-local workers constitute an important stakeholder group because the Workers' Camp is designed to accommodate a substantial male, Chinese national workforce. Engagement with these workers acknowledges potential language, cultural and communication barriers and the possibility that employment dependency or supervisory relationships may influence willingness to raise concerns. Worker-facing information relating to employment conditions, occupational health and safety, emergency procedures, camp rules, the Workers' Code of Conduct, grievance mechanisms and SEA/SH/GBV reporting should therefore be provided in languages and formats workers understand.

Workers should also have access to multiple, safe channels through which concerns can be raised confidentially and without requiring disclosure through their immediate supervisor. Engagement and grievance monitoring should assess whether migrant and non-local workers understand available mechanisms and feel able to use them without fear of retaliation. Migrant and non-local workers are also given contact details for external support that does not depend on the Contractor: the Embassy of the People's Republic of China in Barbados for consular assistance; the Labour Department of the Ministry of Labour, Social Security and the Third Sector for complaints about wages, hours and conditions; and the GBV service providers in Table 111, including the 24-hour helplines. These contacts are printed in Standard Chinese and English on the worker information card issued at induction and displayed in the camp.

7.6.9.3. Engagement Methods

A combination of engagement methods should be used throughout implementation according to the stakeholder group, nature of the issue/s and level of social risk at stake. Methods may include community meetings, small-group discussions, individual interviews, household-level engagement, worker meetings, toolbox talks, targeted consultations with vulnerable groups, engagement with community organizations and leaders, written notices, telephone or electronic communication and confidential feedback mechanisms. The selection of engagement methods should be proportionate to the nature and sensitivity of the issue. General community meetings may be appropriate for routine

Project information, while smaller, confidential engagement methods may be required for sensitive issues such as SEA/SH/GBV, discrimination and worker welfare. These engagements will be carried out in separate and safe spaces for women, youth and other groups to speak freely to eliminate shame and fear of retaliation. Engagement methods should be periodically reviewed to determine whether they are reaching the intended stakeholder groups.

Participation targets and reporting. The Project aims for at least 40 percent women among participants at community consultations and meetings where feasible, and records attendance disaggregated by sex, age and disability for every engagement event, community and worker alike. The in-person town hall of 23 September 2026 reached 44 percent women; the virtual session of 8 October did not record sex, and recording is now standard practice. Where an event falls below the target, the next round is adjusted: timing moved to suit care responsibilities, a separate women's session held, or outreach routed through the channels below. Participation is reported in the quarterly social monitoring report against the indicators in the Gender Monitoring Matrix (Table 192), together with the number of meetings held, the groups reached, the issues raised and the corrective actions taken.

Local communication channels. Information reaches women, older residents, youth, migrants and persons with disabilities through the channels they already use rather than through male household heads or formal notices alone: door-to-door visits by the Community Liaison Officer in Harmony Hall and along the community road; notices at the Maxwell and Elcourt clinics, St Lawrence Primary School, St. Luke's Academy, local churches and shops; the Constituency Council for Christ Church South; women's and community groups and organizations of persons with disabilities; Bajan radio call-in programs; and community WhatsApp groups and the social media pages of the Barbados Water Authority. Materials are in plain English, with Standard Chinese for worker-facing content, and in large-print and audio formats on request.

7.6.9.4. Stakeholder Engagement and SEA/SH/GBV

SEA/SH/GBV-related engagement will be undertaken carefully to avoid creating additional risks for survivors or potentially affected persons. Community and worker engagement should focus on awareness of expected standards of conduct, prohibited behaviors, available reporting mechanisms and referral options. Stakeholders should be informed that SEA/SH/GBV concerns can be reported confidentially and that they will be assessed using a survivor-centered approach.

Public consultation should not seek disclosure of individual experiences of SEA/SH/GBV. Individual cases should not be discussed in general stakeholder meetings or recorded in public consultation documentation. Information obtained through SEA/SH/GBV reporting mechanisms will be managed in accordance with confidentiality requirements, and only non-identifying information should be used for general monitoring and assessment. Interviews addressing sensitive topics such as SH/SEA/GBV will be conducted by trained personnel and will follow do-no-harm and survivor-centered principles.

Some groups are unlikely to attend public meetings or to hear about the confidential channel through general outreach: adolescents, LGBTIQ+ persons, sex workers and women working informally in St. Lawrence Gap, and migrant women in domestic or hospitality work. Information on prohibited conduct and on the confidential channel reaches them through intermediaries they already trust rather than through Project-led meetings: the schools' guidance counsellors and the Constituency Council's youth programs for adolescents; LGBTIQ+ and HIV support organizations; harm-reduction and sexual health outreach services working with sex workers; and churches and community groups serving migrant women. No attempt is made to identify or record individuals from these groups; the measure is that the

confidential channel is known and trusted, which is tested through the GRM awareness survey in Table 192.

7.6.9.5. *Integration with the Grievance Redress Mechanism*

Stakeholder engagement will be closely linked to the Project Grievance Redress Mechanism (GRM). Engagement provides an opportunity to increase awareness of the GRM, explain available reporting channels and identify barriers that may prevent stakeholders from using the mechanism. Stakeholders should be informed of how and where grievances can be submitted, the availability of multiple confidential or anonymous channels, expected response processes and protections against retaliation.

The effectiveness of the GRM should not be assessed solely according to the number of grievances received. Low reporting may indicate few concerns but may also reflect limited awareness, lack of trust, accessibility barriers, confidentiality concerns or fear of retaliation. Stakeholder engagement should therefore periodically assess awareness of the GRM, preferred reporting channels, accessibility, confidence in reporting and confidentiality, barriers to reporting and whether stakeholders consider Project responses appropriate. Differences in access between women and men, local and non-local workers, persons with disabilities and other vulnerable groups should be considered.

7.4.9.5. Feedback and Closing the Engagement Loop

Meaningful stakeholder engagement requires more than collecting information from stakeholders. The Project should establish a clear feedback loop so that stakeholders understand how their concerns and recommendations have been considered. Where a stakeholder recommendation cannot be implemented, the Project should, where appropriate, explain the reason. This feedback process is important for maintaining transparency and trust and for demonstrating that stakeholder engagement contributes to Project decision-making rather than functioning solely as an information-gathering exercise. Grievances raised through stakeholder engagement should also be reviewed alongside grievance data and social monitoring findings, in a disaggregated form to identify differential access, patterns and potential barriers. Recurring concerns may indicate an emerging social impact or that an existing mitigation measure requires modification. The figure below shows the engagement process.

Figure 63 shows the stakeholder engagement process and flow.



Figure *63*: Stakeholder Engagement Process and flow

7.4.9.6. Monitoring Social Inclusion and Engagement Effectiveness

The effectiveness of stakeholder engagement will be monitored throughout Project implementation. Monitoring should move beyond recording the number of meetings held or persons attending and should assess whether relevant stakeholder groups are being reached and whether participation is meaningful. Where appropriate and consistent with privacy requirements, engagement information should be disaggregated by sex, age, disability and other relevant stakeholder characteristics. Monitoring should consider types of activities, participation of vulnerable stakeholders, barriers to identification and participation, grievances raised, stakeholder awareness and perception, as well as corrective actions taken/reviewed and feedback communicated to stakeholders. Where monitoring demonstrates that particular groups are consistently absent or underrepresented, the Project should determine the reasons for their limited participation and modify the engagement approach accordingly.

7.4.9.7. Adaptive Stakeholder Engagement

Stakeholder engagement will remain responsive to changes in Project activities and the social environment. Engagement frequency, methods and target groups should be adjusted where workforce deployment changes, new worker-community interaction points emerge, grievance trends identify recurring concerns, vulnerable groups are found to be disproportionately affected, or monitoring identifies previously unrecognized social risks. The engagement process therefore forms part of the Project's broader adaptive management framework. Information obtained through consultations, community feedback, worker engagement and the GRM should be used to periodically review the Gender and Social Assessment and associated management measures. Material changes in design, construction methods, schedule, access arrangements, workforce deployment, traffic routing, community health and safety exposure, or mitigation measures should trigger a review of affected stakeholders and, where relevant, renewed disclosure and consultation before or promptly after implementation of the change. Through this approach, stakeholder engagement will support the early identification of gender and social risks, meaningful participation by vulnerable persons, equitable access to Project information and safeguards, and continuous improvement of Project mitigation and management measures.

7.4.9.8. Access to the Grievance Mechanism

The Grievance Redress Mechanism carries a separate confidential pathway for sexual exploitation and abuse, sexual harassment, gender-based violence and child protection. Its procedures, timeframes and reporting routes are set out in the Grievance Redress Mechanism (Section 8.4.12).

The existence of that pathway is assessed separately from its effectiveness. Social monitoring under the Social and Gender Methodology examines whether workers and community members are aware of the Grievance Redress Mechanism, whether they know how and where to submit a complaint and what happens after one is received, and whether physical, communication, language, literacy or other barriers prevent them from using it. It examines which reporting channels different groups prefer, and it examines fear of retaliation, particularly where a complaint concerns a supervisor, employer or contractor. It examines whether stakeholders understand how their information is protected, and whether access and use differ between women and men, between local and non-local workers, and for persons with disabilities.

A low number of grievances is treated as an open question and not as evidence that risk is absent. Limited reporting may equally reflect low awareness, absence of trust, fear of retaliation, concern about confidentiality, or difficulty reaching a reporting channel. Grievance data are therefore read alongside stakeholder consultation, worker feedback and observation before any conclusion is drawn about the level of risk. Monitoring of this pathway relies on non-identifying information only. Individual survivor information is not incorporated into social monitoring reports, and where a disclosure is made during routine social engagement, social personnel do not investigate or test the allegation but refer the matter immediately into the confidential survivor-centered procedure described above.

GRM performance and disclosure. Three measures are tracked to show whether the mechanism is known, trusted and working for the groups most at risk: the share of women and men in the Direct Area of Influence who know of the GRM and its confidential SEA/SH/GBV channel and consider it safe to use, measured by a short household survey before camp occupation and annually thereafter; the average time from receipt of a SEA/SH/GBV report to the offer of referral, against the 24-hour standard; and the number of training sessions for GRM focal points and Community Liaison Officers on survivor-centered handling. All three are carried in the Gender Monitoring Matrix (Table 192). The existence of the GRM and how to use it are disclosed in formats and through channels accessible to each group: posters in English at the camp gate, the plant sites, bus stops and community notice points; worker toolbox talks and induction in Standard Chinese and English; community meetings; radio; door-to-door visits for older and housebound residents; and the confidential telephone line printed on all Project materials.

That pathway now has named destinations. The SH/SEA/GBV Prevention and Response Plan of 10 August 2026 sets out a referral directory for Barbados covering health, police protection, psychosocial support, shelter and legal aid, reproduced at Table 111. The plan is built on zero tolerance, a survivor-centered approach in which the survivor determines the course of reporting and investigation, multiple confidential reporting channels including hotline, email, drop box and in person, and a guarantee of non-retaliation for anyone reporting in good faith. Ultimate responsibility for implementation rests with the Project Manager and confidential reporting and investigation are managed by the HR Representative. A confidential grievance register is reviewed monthly and reported quarterly to the Project Execution Unit and the Barbados Water Authority.

Table 111 gives the referral directory.

Table 111: Survivor referral directory, from the SH/SEA/GBV Prevention and Response Plan

Service	Organization	Hours	Services provided
Health	Queen Elizabeth Hospital, Emergency Department	24 hours	Emergency medical care, post-rape treatment, forensic examination
Police protection	Royal Barbados Police Force, Family Conflict Intervention Unit	24 hours	Crisis response, protection orders, relocation assistance
Psychosocial support	SAVE Barbados	24 hours	Confidential counseling, advocacy, accompaniment
Psychosocial support	BPW Crisis Center	Monday to Friday, 8am to 5pm	Individual and group therapy, children’s counseling
Shelter and safe housing	BPW Shelter for Abused Women	24 hours	Temporary housing, skills training, transitional support

Service	Organization	Hours	Services provided
Legal aid	Legal Aid Clinic Barbados	Monday to Friday, 9am to 4pm	Legal advice, protection orders, court representation
Legal aid	SAVE Barbados legal team	By appointment	Legal advocacy, support with police reporting

Two points of operating discipline follow. Referral is on the survivor's consent and at the survivor's direction, not on the project's judgment, and the camp's own procedures must not require a survivor to report internally before reaching an external service. Transport to a shelter or to the hospital is to be arranged by the project where the survivor asks for it, which means a vehicle and a driver must be available outside working hours.

7.4.9.9. Commitments

The following commitments respond to the analysis above. They are carried in the Labor Management Plan and the Environmental and Social Management Plan and are monitored through the Gender Monitoring Matrix.

Table 112 presents the gender commitments and the indicator against which each is monitored.

Table** 112**: Gender commitments with indicator, timeframe and responsibility

Commitment	Indicator
Advertise all locally recruited posts through routes that reach women, including the Bureau of Gender Affairs, community organizations and the Constituency Council, and record where each applicant heard of the post	Applications received by sex, by recruitment route. Timeframe: each recruitment round, from mobilization. Responsible: Contractor HR with subcontractors.
Set no requirement in a job specification that is not necessary for the work, and review specifications for terms that deter women from applying	Specifications reviewed; terms removed. Timeframe: before recruitment opens, and at each new role. Responsible: Contractor HR.
Report recruitment outcomes by sex at each stage, from application through shortlist to appointment, so that where women are lost from the process is visible	Appointment rate by sex at each stage. Timeframe: each recruitment round, reported monthly. Responsible: Contractor HR; verified by the Supervisory Consultant.
Offer training and apprenticeship places in the construction trades to women, with a stated target, given that no woman presently holds one of the 154 posts in those trades	Training places offered and taken up, by sex. Timeframe: target confirmed before mobilization; places offered in each construction year. Responsible: Contractor HR with subcontractors.
Pay equal wages for work of equal value, and audit wage rates by sex annually	Wage audit completed; variance by sex. Timeframe: first audit within 12 months of mobilization, then annually. Responsible: Contractor HR; reported to the PEU.
Provide sanitation segregated by sex, adequate in number, lockable from inside, with cleaning schedules accounting for menstrual hygiene and safe disposal	Inspection findings; complaints received. Timeframe: in place before camp occupation and site works; inspected weekly. Responsible: Camp Manager and HSE Representative.

Commitment	Indicator
Provide accommodation, rest and social space that is safe and private for women, with secure lighting on access routes and a visitor policy	Inspection findings; security incidents. Timeframe: before camp occupation; inspected weekly. Responsible: Camp Manager.
Provide lactation facilities and family provisions where required, and accessible facilities where persons with disabilities are employed	Facilities provided against need identified. Timeframe: within one month of a need being identified. Responsible: Camp Manager and HR Representative.
Deliver induction and refresher training on the Code of Conduct and on SH/SEA/GBV to every worker, in a language they understand, and record attendance disaggregated by sex	Training completion by sex and worker category. Timeframe: at induction before site access; refreshers quarterly. Responsible: HR Representative and HSE Representative.
Consult women separately within community engagement, so that their concerns are recorded rather than aggregated	Consultations held; participants by sex. Timeframe: each engagement round, at least quarterly during construction. Responsible: Social Personnel and Community Liaison Officer.
Report grievances by sex of complainant and by category, and report confidential SH/SEA/GBV cases separately in aggregate	Grievances by sex and category; cases and referrals. Timeframe: monthly, in the quarterly social monitoring report. Responsible: GRM focal points and SH/SEA/GBV focal point.

7.6.10. Conclusion and Recommendations

The GSA identifies manageable social and gender risks associated with the Workers' Camp. The principal areas requiring sustained management are labor influx and worker-community interaction; the predominantly male composition of the workforce; occupational gender segregation; unequal distribution of employment benefits; SEA/SH/GBV; worker welfare and accommodation; community health and safety; access to grievance mechanisms; and the inclusion of vulnerable groups from surrounding communities.

Employment creation and associated economic activity represent important potential benefits. However, the existing workforce profile demonstrates that these benefits are not distributed equally. Women account for a small proportion of the workforce and remain absent from a substantial number of occupational categories. The Project should therefore monitor not only the number of employment opportunities generated but their distribution and accessibility, especially for women.

The assessment further recognizes that vulnerability is multidimensional. The intersection of gender with age, disability, economic and migration status, occupation and other characteristics influences exposure to Project impacts and access to mitigation and benefits. Gender and social considerations must consequently be integrated throughout Project implementation rather than addressed only through standalone gender or vulnerability activities.

Effective implementation of the Labor Management Plan, Social Management Plan, Stakeholder Engagement Plan, Community Health Plan, Workers' Code of Conduct, Grievance Redress Mechanism and SH/SEA/GBV Prevention and Response Plan will be central to managing the various gender and social risks. The existing ESIA and ESMP deliberately use these companion instruments to assign detailed management responsibilities rather than duplicating the same commitments across plans.

The overall approach should therefore maintain a continuous connection between baseline conditions, vulnerability, exposure, differentiated impact, mitigation, monitoring and corrective action. Gender- and socially disaggregated data, meaningful engagement with vulnerable groups, accessible grievance mechanisms and adaptive management should be used throughout implementation to determine whether safeguards are effective and whether Project benefits and adverse impacts are being distributed equitably, and in line with IDB's Environmental and Social Policy Framework (ESPF).

7.7. Stakeholder Engagement Analysis – SCSTP & SCWRRF

7.7.1. Household Field Data Collection

The analysis presented in this section is based on household field data collection conducted between September 25th and October 8th, 2026. This consultation exercise formed a core part of the stakeholder engagement process for the SCSTP & SCWRRF ESIA/ESMP, ensuring that community perspectives were systematically captured and integrated into the assessment.

Fieldwork was conducted across several key communities along the South Coast, including:

- Harmony Hall (largest concentration of respondents)
- Dover
- Rendezvous Gardens
- Graeme Hall
- Amity Lodge
- Other surrounding neighbourhoods within the project's catchment area

These areas were selected to reflect both directly affected households and communities in proximity to construction and operational activities.

Participation and Demographic Profile

A total of 79 households were engaged during the consultation period. The demographic breakdown is as follows:

- By Sex/Gender
    - 44 males (56%)
    - 31 females (39%)
    - 4 respondents (5%) who preferred not to disclose
- By Age Group
    - 18–35 years: 28 respondents (35%)
    - 36–59 years: 32 respondents (41%)
    - 60+ years: 19 respondents (24%)
- By Household Type
    - Female-headed households: 14 (18%)
    - Elderly living alone: 12 (15%)
    - Tenant/renter households: 9 (11%)
    - Migrant/non-national workers: 3 (4%)

This demographic profile demonstrates that the consultation captured a diverse cross-section of community voices, with strong representation from working-age youth and adults, as well as elderly and vulnerable groups. The inclusion of female-headed households and migrant workers ensures that the

analysis reflects differentiated social realities and aligns with Gender Equality, Disability, and Social Inclusion (GEDSI) principles.

7.7.1.1. Construction Environment, Impacts and Complaints

Community members consistently identified construction-related noise, dust, and traffic congestion as the most immediate concerns. Out of the 79 households surveyed, 36 respondents (46%) cited noise as a major issue, particularly during peak commuting hours and near schools. For example, one respondent from Harmony Hall noted that *"traffic around school during morning and afternoon period"* would be a significant disruption.

Traffic congestion was highlighted by 28 respondents (35%), with elderly persons and caregivers stressing that mobility challenges would be compounded by heavy equipment and construction vehicles. Dust and air quality concerns were raised by 16 respondents (20%), especially among those with asthma or respiratory conditions. A female respondent from Harmony Hall explained that *"Dust, I'm asthmatic"* was her primary worry.

Trend: Younger men (18–35) emphasized traffic and timing of construction, while women and elderly respondents focused on health, safety, and household disruption. This reflects a generational divide in how impacts are perceived, with younger groups more concerned about logistics and older groups more sensitive to health and wellbeing.

7.7.1.2. Perceptions of Project Benefits

Despite concerns, stakeholders expressed optimism about long-term benefits. 32 respondents (41%) cited improved wastewater treatment and sanitation as the most important positive outcome. One respondent summarized this by saying the project could bring *"better wastewater management and economic opportunities."*

Employment and training opportunities were highlighted by 28 respondents (35%), especially among youth and unemployed participants. Many emphasized apprenticeships, administrative positions, and support services for women and young people. For example, a respondent from Dover stated that *"Youth should be offered training and entry-level employment opportunities."*

Environmental improvements were mentioned by 20 respondents (25%), including reduced pollution and better water conservation. A respondent from Graeme Hall noted that the project could lead to *"improved marine health and reduced coastal pollution."*

Trend:

- **Youth (18–35):** Strong emphasis on apprenticeships and entry-level jobs.
- **Women (36–59):** More likely to highlight environmental and household health benefits.
- **Elderly (60+):** Valued water supply improvements but worried about disruptions.

7.7.1.3. Community Relations and Wellbeing

Concerns about worker behavior and community relations were raised by 16 respondents (20%). These concerns were not only about technical impacts but also about social dynamics. Several participants called for clear codes of conduct for workers, stressing the need for respectful interaction with residents, especially women and vulnerable groups. One female-headed household respondent from Harmony Hall emphasized that *"Workers should respect residents and follow a strict code of conduct."*

Transparent grievance redress mechanisms were also requested, with respondents noting that complaints should be handled quickly and visibly to build trust. Without such mechanisms, there is a risk of resentment and conflict between residents and project operators.

Trend: Female-headed households and caregivers were more likely to raise issues of harassment, safety, and respect, while younger men focused on operational disruptions such as traffic and noise.

Gender Equality, Disability, and Social Inclusion (GEDSI)

The field data collection revealed important insights into how different groups may be affected:

- Female-headed households (14 respondents, 18%): Concerned about harassment and worker conduct, with emphasis on safety for women and children.
- Elderly living alone (12 respondents, 15%): Reported heightened vulnerability to noise, dust, and mobility restrictions.
- Persons with disabilities (~8 respondents, 10%): Noted challenges with access and transportation disruptions.
- Youth (28 respondents, 35%): Strong demand for training and employment opportunities, with calls for apprenticeships and fair recruitment.

Trend: Women and vulnerable groups consistently emphasized safety, inclusion, and respectful engagement, while men focused more on employment and traffic impacts. This aligns with broader GEDSI findings in other stakeholder reports, where differentiated impacts are linked to age, gender, and social status.

7.7.1.4. Enabling and Regulatory Environment

Respondents stressed the need for clear communication channels to manage expectations and reduce disruption. 32 respondents (41%) wanted regular updates on construction schedules, with younger respondents preferring social media and older participants relying on notice boards and townhalls.

Advance notice of construction activities was seen as essential to allow households to plan around disruptions. Transparent job advertisement processes were also emphasized, with several respondents noting that opportunities should be *"advertised widely so local people know about them."*

Trend: Diverging communication needs between younger and older demographics highlights the importance of using multi-channel strategies to ensure inclusivity.

7.7.1.5. Institutional Capacity

Community members expect stronger monitoring and enforcement of dust, traffic, and noise controls. Several respondents called for training for workers on respectful behavior and community interaction, linking this directly to community trust.

Local hiring policies were seen as critical to ensure equitable distribution of project benefits. Skepticism about foreign labor was raised by multiple respondents, with one noting: *"If they are bringing the Chinese it won't, but I believe Bajans should get an opportunity."*

7.7.1.6. Grievance Redress Mechanisms

16 respondents (20%) explicitly requested a clear complaint process. Suggested mechanisms included community hotlines, townhall follow-ups, and transparent reporting systems. Trust in GRMs will depend on visible follow-up actions and timely resolution of complaints.

One respondent emphasized that *"There should be a clear complaint process if workers behave inappropriately."* This highlights the link between grievance systems and perceptions of fairness and accountability.

7.7.1.7. Key Insights

- **Trust gap:** Skepticism exists about whether locals will benefit, especially with mention of foreign labor.
- **Communication gap:** Older respondents rely on traditional channels; younger ones expect digital updates.
- **Geographic variation:** Harmony Hall respondents were most vocal about traffic and dust, Dover respondents emphasized business and school impacts, while Graeme Hall and Rendezvous Gardens highlighted environmental and safety concerns.

7.7.2. Townhall Engagement

7.7.2.1. In-Person Townhall (Second Townhall – September 23, 2026, Hawthorne Methodist Church)

The second public consultation was held in-person at Hawthorne Methodist Church, with 59 attendees recorded. Attendance was sex-disaggregated: 30 men (50.8%), 26 women (44.1%), and 3 participants (5.1%) not recorded or marked as N/A.

Themes and Feedback:

- **Water Security and Agriculture:** A farmer representative welcomed the project's reclaimed-water component, noting its potential to improve agricultural water availability in St. Philip and beyond.
- **Construction Readiness:** The contractor reported mobilization activities including site clearing, drainage works, delivery of equipment, and reinforcing steel. Temporary impacts such as dust and noise were acknowledged, with one dust complaint addressed through mitigation measures.
- **Environmental and Social Safeguards:** Presentations highlighted risks related to traffic, sanitation, biodiversity, and community health, alongside mitigation measures such as monitoring, emergency response, and worker codes of conduct.
- **Public Health:** Emphasis was placed on treatment standards, groundwater monitoring, and oversight by the Ministry of Health.
- **Community Feedback:** Two interventions were recorded, one supportive farmer comment and one resident complaint about recurrent odor in Rendezvous Ridge. The project team committed to follow-up investigation.

The in-person format allowed for direct community interaction, but substantive questions were limited. Feedback was practical, focusing on odor, dust, and agricultural water supply. The meeting reinforced the need for continued monitoring and responsive grievance mechanisms.

7.7.2.2. Virtual Townhall (Third Townhall – October 8, 2026, Zoom)

The third consultation was conducted virtually, convened by the Barbados Water Authority with SAEDI Consulting. Attendance logs recorded 34 entries, with Zoom screenshots showing 28–30 concurrent participants.

Themes and Feedback:

- **Project Disclosure:** Presentations covered project scope, financing, ESIA/ESMP findings, and mitigation measures.
- **Worker Facilities and Conduct:** Stakeholders asked about parking, welfare facilities, smoking restrictions, and worker sourcing. The project team confirmed that an on-site workers' camp would manage accommodation, welfare, and conduct, with codes of conduct and ESMP requirements in place.
- **Reclaimed Water Use:** Questions focused on how reclaimed water would reduce potable-water demand. The team explained its role in agricultural irrigation and non-potable recharge.
- **Pipeline Alignment:** Concerns were raised about whether the pipeline would pass near Dover/Divi Southwinds. The alignment was clarified to avoid Highway 7 and Dover, instead extending toward St. George Valley and agricultural areas.
- **Community Assets:** The Future Centre Trust proposed using the pipeline corridor for a walking and cycling trail. While project funding could not support trail paving, the team expressed openness to coordination if reinstatement specifications were compatible.
- **Worker Sourcing:** Clarification was provided that Chinese (i.e. non-national) workers would be housed in the camp, while Barbadian workers would commute.

Insight: The virtual format enabled broader participation from institutional stakeholders and civil society, with more technical and forward-looking questions compared to the in-person session. Issues of worker conduct, pipeline alignment, and reclaimed-water use were central, alongside innovative proposals for community co-benefits such as the trailway.

Comparative Observations

- **Format Differences:** The inperson townhall captured localised community concerns (odor, dust, agriculture), while the virtual townhall drew institutional and technical questions (pipeline alignment, reclaimed water, worker facilities).
- **Participation:** The in-person session had a larger turnout (59 vs. 34 logged entries), with stronger representation from farmers and residents. The virtual session had mainly institutional voices (BWA, IDB, Future Centre Trust, etc.0 present, compared to the in-person session that had more community voices there.
- **Feedback Nature:** In-person feedback was practical and immediate, while virtual feedback was strategic and technical, reflecting different stakeholder priorities.
- **Cross-cutting Themes:** Both sessions reinforced the importance of managing temporary construction impacts, ensuring worker conduct standards, and maintaining transparent grievance channels.

7.8. Cumulative Impacts

Cumulative effects are assessed at two levels. *Within-Project* accumulation addresses the combination of the reclamation facility, the plant upgrade and the workers' camp, which occupy adjacent footprints, draw on the same access road, workforce and haulage network, discharge to the same receiving environment and are constructed on overlapping programs. *Beyond-Project a*ccumulation addresses the combination of this Project with other activity drawing on the same road network, disposal capacity and regulatory capacity in Barbados.

The within-Project assessment is the more consequential of the two, and it is not the arithmetic sum of the component assessments. **Road safety exposure on a single shared route compounds through frequency; simultaneous earthworks during the wet season multiply the sediment load reaching one receptor; and combined dust, noise and traffic at the residential and school receptors exceed the significance of any component assessed alone**. Management is therefore coordinated across components rather than applied component by component, since separate controls at each produce gaps at the interfaces between them.

7.8.1. Within-Project Accumulation

The reclamation facility and the plant upgrade are constructed on adjacent footprints, drawing on the same access road, the same workforce and the same haulage network, and discharging to the same receiving environment, with overlapping programs.

Three combinations warrant assessment:

Traffic on the shared access route. Combined construction traffic, deliveries, sludge and waste transport and workforce movement compound through frequency, and the road safety pathway is not the sum of two separate assessments. A single integrated movement plan applies across both facilities.

Runoff to the wetland during the wet season. Simultaneous earthworks on both footprints during periods of heavy rainfall multiply the sediment and contaminant load reaching the same receptor, on a receiving environment already carrying pressures from urban drainage inputs, illegal dumping and Hurricane Beryl storm damage.

Nuisance at community receptors. Combined dust, noise and traffic at the residential and school receptors exceed the significance of either facility assessed alone, and act on a population in which 25.8 percent of residents are aged 65 and over.

7.8.2. Beyond-Project Accumulation

Concurrent construction activity elsewhere in Barbados places combined pressure on the road network for heavy haulage, on landfill capacity for construction and demolition waste, and on institutional capacity within the Environmental Protection Department, the Barbados Water Authority, the Coastal Zone Management Unit and the Sanitation Service Authority for management and oversight of an evolving risk profile, proposed safeguards and mitigation measures and the ability to deploy adaptive management as and when needed.

7.8.3. Management of Cumulative Effects

Accordingly, cumulative effects are managed through six arrangements:

Construction programs for the two facilities are coordinated so that bulk earthworks on both footprints do not coincide during the June to November wet and cyclone season.

A single integrated traffic movement plan governs vehicle movements for both facilities on the shared access road, applying one set of transit windows, speed limits and staging arrangements.

Community notification is consolidated, so that residents receive one notice covering both facilities and are not approached separately for overlapping activity.

Monitoring at shared receptors is joint. The residential and school receptors, the wetland margin and the access road are monitored once for both facilities, with results reported against each.

A combined complaint register permits attribution between the two facilities, so that a pattern arising from one is not obscured by activity at the other.

Institutional demand is coordinated with the Environmental Protection Department, the Ministry of Health and the Sanitation Service Authority, recognizing that both facilities draw on the same regulatory capacity at the same time.

7.9. Summary of Significance

The table below consolidates the ratings recorded in the individual assessments in this chapter. It is a reading aid and not a separate assessment: where it differs from an individual impact table, the impact table governs. The social pathways PRJ-SI-01 to PRJ-SI-07 are assessed at Project level in this chapter and apply to the plant upgrade as well, so their ratings appear in both summaries.

Table 113 presents the summary of significance.

Table** 113**: Summary of significance

Ref	Pathway	Pre-mitigation	Residual	Management priority
PRJ-EI-01	Runoff, sediment transport and water quality	Very High	Low to Medium	High
PRJ-EI-02	Vegetation clearance and habitat loss	High to Very High	High	Medium
PRJ-EI-03	Disturbance from noise, lighting and human presence	High	Medium	Medium
PRJ-EI-04	Hydrological change	High	Low to Medium	High, conditional on drainage design confirmation
PRJ-EI-05	Air quality and dust	High	Low	Medium
PRJ-	Noise and vibration	High	Medium	Medium

Ref	Pathway	Pre-mitigation	Residual	Management priority
EI-06				
PRJ-EI-07	Traffic and road safety (Priority)	Critical	Medium	Highest
PRJ-EI-08	Waste, spoil and hazardous materials	Medium	Low	Medium
PRJ-EI-09	Reclaimed water quality, aquifer recharge and agricultural reuse (Priority)	Very High	Medium	Highest
PRJ-EI-10	Sludge and residuals	Medium	Low	Low
PRJ-EI-11	Odor and bioaerosols	Medium	Low	Low
PRJ-EI-12	Energy demand and greenhouse gas emissions	High	Medium to High	Low
PRJ-EI-13	Chance find of cultural heritage	Medium	Low	Low
PRJ-EI-14	Alteration of the existing wetland conveyance	High	Medium	High, conditional on Critical Habitat review
PRJ-EI-15	Accidental and emergency release (Priority)	High to Very High	Medium	Highest
PRJ-EI-16	Vector breeding	High	Low	Medium
PRJ-SI-01	Employment, local hiring and procurement	High, positive, with a High adverse distributional element	High, positive, with a Low to Medium adverse element	Medium
PRJ-SI-02	Labor influx and worker-community interaction	High	Low	Medium
PRJ-SI-03	Sexual exploitation and abuse, sexual harassment and gender-based violence (Priority)	Critical	High	Highest
PRJ-SI-04	Community health and safety	Very High	Medium	High
PRJ-SI-05	Livelihood effects	Medium	Low	Medium
PRJ-	Nuisance effects on amenity and	High	Medium	Medium

Ref	Pathway	Pre-mitigation	Residual	Management priority
SI-06	quality of life			
PRJ-SI-07	Public acceptance, perception and trust	High	Low	Medium

Two pathways retain a residual rating of High: PRJ-SI-03, which is common to the Project and discussed in the plant upgrade summary, and PRJ-EI-02, where clearance within the approved footprint is certain. PRJ-EI-07, PRJ-EI-09 and PRJ-EI-15 reduce to Medium. PRJ-EI-09 and PRJ-EI-15 are specific to this facility, and both share a structure worth stating plainly: the controls act on the likelihood of the event and not on its consequence, so the residual rating reflects a low probability of an outcome that would remain serious if it occurred. Management of both therefore concentrates on the integrity of the preventive controls and on the speed of detection, rather than on the assumption that consequences can be reduced after the fact. PRJ-EI-07, PRJ-EI-09, PRJ-EI-15 and PRJ-SI-03 are priority pathways under Section 5.3 and keep the highest management priority whatever their residual rating.

The residual rating recorded at PRJ-EI-02 requires a note. The impact table records a post-mitigation likelihood of 5, because clearance within the approved footprint is certain, and a post-mitigation magnitude of 2. On the risk matrix at the Assessment Methodology, that combination scores 10 and yields High, and the summary above adopts High. The substantive position is unchanged: the residual effect is a small, permanent loss of non-wetland brushland outside the Ramsar boundary, managed through footprint control and a conservation priority vegetation register.

7.10. Consolidated Impact and Risk Assessment Matrix

The Environmental and Social Impact and Risk Assessment Matrix below identifies, categorizes and evaluates the potential environmental, social, gender-related and socio-environmental impacts associated with the construction, operation, maintenance and long-term performance of the SCSTP and the SCWRRF. It links Project activities to potential impacts, to the associated risks and consequences, and to the mitigation required to avoid, minimize, restore or compensate for adverse effects. Its purpose is to give a reader, and a manager, a single view across the two facilities that the chapter-by-chapter assessments cannot provide.

The matrix classifies impacts in three categories. Environmental impacts affect physical and ecological receptors, including air quality, water resources, groundwater, soils, marine ecosystems, biodiversity and ecosystem functioning. Social impacts affect communities, livelihoods, public safety, social cohesion, employment, stakeholder relations, gender equality and vulnerable groups. Socio-environmental impacts arise where environmental change directly influences human wellbeing, public health, ecosystem services, resource availability, economic activity or community resilience, and the Graeme Hall pathways fall predominantly in this third category because the wetland is simultaneously an ecological receptor and the source of services on which the surrounding community depends.

Every row is scored on the likelihood and magnitude scales at the Assessment Methodology and carries the reference of the impact assessment from which it derives, so that a summary rating can be traced to the analysis supporting it. Ratings are pre-mitigation, reflecting the risk inherent in the activity before the management measures are applied. Where a row consolidates pathways assessed separately in the two chapters, the higher of the two ratings is carried.

Table 114 presents the consolidated impact and risk assessment matrix.

Table* 114*: Consolidated impact and risk assessment matrix

Ref	Type and facility	Activity and potential impact	Risk or consequence	Likelihood (L), magnitude (M) and pre-mitigation significance	Principal mitigation
PRJ-EI-01	Environmental, Both	Site clearing, excavation and earthworks causing soil erosion and sedimentation	Sediment and contaminant runoff to the eastern gully, the Eastern Marsh and connected drainage	L 4; M 4; Very High	Erosion and sediment controls before ground disturbance, phased clearing, stabilization, stormwater attenuation, wetland margin monitoring
PRJ-EI-05, PRJ-EI-06	Environmental, Both	Construction equipment and demolition generating dust and air emissions	Reduced local air quality at residential, school and wetland receptors	L 4; M 3; High	Water suppression, covered stockpiles and loads, wheel wash, screening, receptor monitoring, work stop on visible dust migration
PRJ-EI-08, PRJ-EI-09	Environmental, Both	Fuel and chemical storage causing soil and groundwater contamination	Contamination of the karst aquifer, which provides limited natural attenuation	L 3; M 4; High	Bunded impermeable storage with secondary containment, weekly inspection, spill response equipment and trained responders
PRJ-EI-08, PRJ-EI-09	Environmental, Both	Waste generation and improper disposal	Land and water contamination, and reinforcement of existing dumping pressure at the Eastern Marsh	L 3; M 3; Medium	Segregation at source, authorized transport contractor, government-approved disposal site, waste transfer records reconciled monthly
STP-EI-04, PRJ-EI-10	Environmental, Both	Sludge and residuals handling, storage and disposal	Secondary contamination, leachate to groundwater, odor and vector attraction	L 4; M 3; High	Sludge and Residuals Management Plan, enclosed bunded storage with leachate capture, sealed transport, characterization before disposal routing
STP-EI-05	Environmental, SCSTP	Effluent discharge to the receiving environment following the upgrade	Improvement in coastal and wetland water quality, and removal of a continuing pollutant source	L 4; M 4; Very High, positive	Commissioning and performance verification, effluent and coastal monitoring against the April 2026 baseline, public disclosure of performance

Ref	Type and facility	Activity and potential impact	Risk or consequence	Likelihood (L), magnitude (M) and pre-mitigation significance	Principal mitigation
PRJ-EI-04	Environmental, Both	Hard surfacing, drainage works and groundwater interaction causing hydrological alteration	Change in the water balance sustaining wetland ecological character	L 3; M 4; High	Drainage designed to pre-development runoff regime, eastern gully retained open, demonstration of no material alteration before construction approval
STP-EI-13, PRJ-EI-12	Environmental, Both	Energy-intensive construction and operation generating greenhouse gas emissions	Increased carbon footprint against the Contract non-carbon emissions commitment	L 5; M 2; High	Greenhouse gases added to the monitoring program, energy efficiency at design, renewable generation assessed, annual reporting
PRJ-EI-03	Environmental, SCWRRF	Construction and operational lighting, noise and human presence at the wetland margin	Disturbance and displacement of migratory, congregatory and range-restricted birds (KBF 3, KBF 4)	L 4; M 3; High	Low-spill directional lighting, demarcated boundary, seasonal scheduling, ecological watching brief
PRJ-EI-02	Environmental, SCWRRF	Vegetation clearance within the construction footprint	Loss of brushland habitat in Good condition and of conservation priority flora including lignum-vitae	L 5; M 2 to 3; High to Very High	Footprint demarcation, pre-clearance survey, conservation priority vegetation register, prohibition of clearance outside the approved extent
STP-EI-08, PRJ-EI-07	Social, Both	Construction traffic, deliveries, sludge and waste haulage and workforce movement on a shared narrow residential road	Pedestrian strike, serious injury or fatality, particularly of schoolchildren and accompanying caregivers	L 4; M 5; Critical	Single integrated Traffic and Pedestrian Management Plan, school-sensitive transit windows, 15 kilometers per hour community limit, trained wardens, off-site staging, movement log
STP-EI-07, PRJ-EI-06	Social, Both	Construction noise and vibration at residential and school receptors	Serious annoyance and interference with teaching, incremental to an ambient condition already at or above 55 dB(A)	L 4; M 3; High	Noise Management Plan, restricted hours, low-noise plant and screening, coordinated scheduling across components, boundary monitoring

Ref	Type and facility	Activity and potential impact	Risk or consequence	Likelihood (L), magnitude (M) and pre-mitigation significance	Principal mitigation
STP-EI-03, PRJ-EI-11	Socio-environmental, Both	Odor, hydrogen sulfide and bioaerosol release from treatment and reclamation operations	Headache, nausea and respiratory irritation, amenity loss and community complaint at 250 meters	L 4; M 3; High	Continuous hydrogen sulfide monitoring with boundary alarm, odor management procedure, wind-referenced scheduling, advance notification
PRJ-SI-01	Social, Both	Employment, recruitment and procurement	Unequal access to opportunity: 21 of 252 posts held by women, and 154 posts in roles employing none	L 4; M 3; High, positive, with a High adverse distributional element	Local and sex-disaggregated recruitment targets and reporting, recruitment channels reaching women, reserved training places, written confirmation of the Contractor's position
PRJ-SI-02	Social, Both	Labor influx and worker-community interaction at peak deployment	Community complaint, social tension, and inflationary pressure on food, fuel and rents falling hardest on female-headed households	L 4; M 3; High	Worker-community interaction protocol, Code of Conduct with enforced sanctions, multilingual communication, camp self-sufficiency, price and rental baseline
PRJ-SI-03	Gender and social, Both	Workforce-community interaction from a workforce that is 91.7 percent male housed adjacent to a residential community	Sexual exploitation and abuse, sexual harassment and gender-based violence affecting women and girls	L 4; M 5; Critical	SEA, SH and GBV Prevention and Response Plan in force before mobilization, Code of Conduct, confidential reporting independent of the camp and line management, survivor referral agreed in advance
PRJ-SI-07	Social, Both	Disclosure, consultation and grievance handling	Community dissatisfaction, loss of social license, and reduced willingness to act on public health advice	L 4; M 3; High	Disclosure of current plant performance, advance notification of bypass and high-odor works, engagement on the concerns residents have raised, published monitoring results
PRJ-	Social, Both	Access restriction,	Temporary income loss falling on	L 3; M 3;	Maintained access with agreed alternatives,

Ref	Type and facility	Activity and potential impact	Risk or consequence	Likelihood (L), magnitude (M) and pre-mitigation significance	Principal mitigation
SI-05		congestion and nuisance affecting businesses, vendors and accommodation providers	informal vendors, fixed-income and female-headed households	Medium	advance notice, local procurement, grievance route for income-loss claims
PRJ-EI-01, STP-EI-02	Socio-environmental, SCSTP	Bypass activation and plant process failure releasing untreated or partially treated sewage	Contamination of Critical Habitat and of recreational waters, and exposure to pathogens	L 5; M 4 to 5; Critical	Operational Continuity and Bypass Management Plan, Sewage Spill Response Protocol recognizing Graeme Hall as Critical Habitat, containment, defined notification, post-event monitoring
PRJ-EI-15	Socio-environmental, SCWRRF	Accidental or emergency release of chemicals, fuel or process water	Contamination of Critical Habitat, with effects on hydrology, water quality and species features	L 2 to 3; M 5; High to Very High	Storage away from wetland margins, secondary containment, on-site spill response, engineering confirmation of containment before operation, notification within four hours
PRJ-EI-09	Socio-environmental, SCWRRF	Reclaimed water production, aquifer recharge and agricultural reuse	Contamination of the island's principal freshwater source and exposure through irrigated produce	L 3; M 5; Very High	Confirmed national standard before commissioning, groundwater baseline before recharge, multi-barrier treatment with online monitoring and automatic diversion, point-of-use verification
STP-EI-10	Socio-environmental, Both	Standing water on works areas and altered wetland hydrology	Increased mosquito breeding and vector-borne disease transmission in a community identifying mosquitoes as its primary health concern	L 4; M 3; High	Weekly inspection and elimination of standing water within 24 hours, protection of the Ministry of Health fish breeding station, coordination with Ministry clearing and fogging
STP-	Socio-	Works affecting	Disturbance to	L 3; M 4; High	Configuration confirmed

Ref	Type and facility	Activity and potential impact	Risk or consequence	Likelihood (L), magnitude (M) and pre-mitigation significance	Principal mitigation
EI-11, PRJ-EI-14	environmental, Both	the existing outflow conveyance within the Core Critical Habitat Area	wetland substrate, hydrology and avifauna, and alteration of the wetland to coast connection		as a single decision, Critical Habitat review before any removal, supervised method statement, seasonal restriction, ecological supervision
Project-wide	Socio-environmental, Both	Hurricanes, extreme rainfall and flooding acting on facility integrity	Wastewater release, service interruption and community health risk, with the Project near the boundary of a 100-year floodplain	L 4; M 4; Very High	Climate-resilient design, emergency preparedness and response planning, infrastructure redundancy, hurricane-season program coordination
STP-EI-05, PRJ-SI-01	Socio-environmental, Both	Improved treatment performance, reclaimed water production and reduced groundwater abstraction	Improved public health outcomes, reduced pollutant loading, and increased national water security	L 4; M 4; Very High, positive	Effective operation and maintenance, quality assurance and monitoring, public reporting of performance

7.11. Residual Risk

The table below records the risk expected to remain after the mitigation and management measures in the Environmental and Social Management Plan have been implemented, monitored and maintained. The ratings are not unmanaged Project conditions: they assume that the measures perform as designed. Where monitoring demonstrates that a measure is not performing, the residual rating is not the applicable one and the corrective action process applies.

Management priority is assigned from the residual rating together with the reversibility of the consequence and the number of distinct controls on which the rating depends. A pathway rated Low can still carry a high priority where its rating rests on a single pre-condition that must not be missed, and this is why the pre-demolition asbestos survey and the Critical Habitat review of the conveyance appear at high priority despite low residual ratings.

Table 115 presents the residual risk.

Table** 115**: Residual risk

Ref	Risk category	Key residual risk	Residual likelihood (L) and magnitude (M)	Residual significance	Management priority
PRJ-EI-01, PRJ-EI-04	Biodiversity and Critical Habitat	Effects on the ecological integrity, hydrological functioning and biodiversity values of the Graeme Hall Swamp Critical Habitat	L 2; M 2 to 3	Low to Medium	High
STP-EI-01, STP-EI-02	Wastewater treatment performance and operational continuity	Discharge of untreated or inadequately treated effluent during bypass, construction or plant failure	L 4; M 3	High	Highest
PRJ-EI-09	Reclaimed water, groundwater and food chain	Off-specification recharge or irrigation reaching the karst aquifer or irrigated produce	L 2; M 4	Medium	Highest
PRJ-EI-15	Accidental and emergency release	Uncontrolled chemical, fuel or process water release reaching Critical Habitat	L 2; M 4	Medium	Highest
PRJ-SI-03	SEA, SH and GBV	Sexual exploitation, abuse, harassment and gender-based violence associated with workforce presence	L 2; M 5	High	Highest
STP-EI-08, PRJ-EI-07	Traffic and road safety	Vehicle and pedestrian collision on the shared community access route	L 2; M 4	Medium	Highest
Project-wide	Climate and natural hazards	Hurricanes, extreme rainfall and flooding affecting facility integrity and operational performance	L 3; M 4	High	High
PRJ-SI-04	Community health and safety	Public exposure to wastewater releases, odor, vectors and associated health risks	L 2; M 3	Medium	High
STP-EI-11, PRJ-EI-14	Works within Critical Habitat	Alteration or removal of the existing conveyance without prior Critical Habitat review	L 2; M 3	Medium	High, on a single pre-condition
STP-EI-09	Hazardous materials in	Release of asbestos or other hazardous material during demolition of redundant	L 2; M 2	Low	High, on a single pre-

Ref	Risk category	Key residual risk	Residual likelihood (L) and magnitude (M)	Residual significance	Management priority
	demolition	structures			condition
STP-EI-03, PRJ-EI-11	Odor management	Nuisance effects causing community complaint and reduced quality of life	L 3; M 2	Medium	Medium
STP-EI-07, PRJ-EI-06	Noise and vibration	Disturbance to residents, schools and other sensitive receptors above an existing ambient exceedance	L 3; M 2	Medium	Medium
PRJ-SI-06	Cumulative nuisance and amenity	Combined dust, noise, traffic and visual change on quality of life across three concurrent components	L 3; M 2	Medium	Medium
PRJ-EI-03	Disturbance to avifauna	Displacement of migratory, congregatory and range-restricted birds by lighting, noise and presence	L 3; M 2	Medium	Medium
PRJ-EI-05, PRJ-EI-06	Air quality and dust	Temporary nuisance and health effects from dust and equipment emissions	L 2; M 2	Low	Medium
PRJ-SI-01	Distribution of employment benefit	Employment and procurement benefit accruing unequally by sex and declining as construction intensity peaks	L 3; M 3	Medium	Medium
PRJ-SI-02, PRJ-SI-05	Livelihood, business disruption and price pressure	Temporary effects on access, mobility, local economic activity and household costs	L 2; M 2	Low	Medium
PRJ-SI-07	Stakeholder relations and community acceptance	Grievances, dissatisfaction or reduced social license, including acceptance of the reuse program	L 2; M 2	Low	Medium
PRJ-EI-08, PRJ-EI-09	Waste and disposal	Improper disposal, leachate or windblown material from construction and demolition waste streams	L 2; M 2	Low	Low
STP-EI-13,	Energy and greenhouse	Operational emissions carried without a measured baseline	L 5; M 1 to 2	Medium to	Low

Ref	Risk category	Key residual risk	Residual likelihood (L) and magnitude (M)	Residual significance	Management priority
PRJ-EI-12	gas emissions	against the Contract non-carbon commitment		High	

Three conclusions follow. Routine construction effects, comprising dust, noise, temporary traffic disruption and access limitation, reduce to Low or Medium through standard measures and are temporary, localized and reversible. Operational effects including odor, sludge management and waste generation remain manageable where the facilities are operated in accordance with established procedures, with monitoring, maintenance and engagement determining whether they stay there.

The risks that remain comparatively significant share a common structure: mitigation reduces their likelihood but not their consequence. Treatment failure, accidental release of untreated effluent, off-specification recharge, effects on the ecological integrity of the Graeme Hall Critical Habitat, road traffic injury and gender-based violence all fall into that group. Management of them concentrates on the integrity of preventive controls, on the speed of detection and on emergency preparedness, rather than on an assumption that consequences can be reduced after an event. Climate-related hazards remain among the most consequential residual risks through the operational life of the Project, and are addressed through resilient design, redundancy and preparedness rather than through elimination.

These residual risks should be read alongside the beneficial outcomes that the Project is expected to deliver: improved wastewater treatment performance measured against a quantified and currently failing baseline, enhanced water reuse capacity, reduced pollutant loading to the wetland and coastal environments, reduced groundwater abstraction, strengthened protection of public health, and increased long-term water security for Barbados. **The assessment concludes that the SCSTP and SCWRRF can be constructed and operated at an acceptable level of environmental and social risk, provided the measures identified are integrated into design, construction management, operational procedure and monitoring, and provided the pre-conditions recorded in the priority measures are met before the activities they govern proceed. This conclusion is consistent with IDB ESPS 1, under which residual impacts are acceptable once the mitigation hierarchy has been applied and any significant residual impact is compensated or offset where technically and financially feasible.**

7.12. Gate Conditions

Certain measures are conditions precedent. The activity each governs does not commence until the condition is met and verified. Gate conditions differ from ordinary mitigation because the residual significance ratings in this assessment do not apply until they are satisfied.

Responsibility, verification and release. The Contractor is responsible for meeting each gate condition unless the table names another party, and each condition must be met before the activity it governs begins. The Project Execution Unit has agreed to verify the conditions assigned to it, including the low-spill lighting design (G-19) and the commissioning risk assessment (G-20), and is the release authority for every gate: the activity may proceed only once the Project Execution Unit has confirmed in writing that the condition is met, on the basis of verification by the party named in the table. Gate status is recorded in a gate register kept by the Contractor and reported in each monthly ESMP report.

Table 116 presents the pre-construction and pre-operational gate conditions.

Table** 116**: Pre-construction and pre-operational gate conditions

Gate	Condition	Governs	Verified by
G-01	Operational continuity and bypass strategy approved, specifying duration, frequency and discharge quality for each stage	Any work requiring a process unit to be taken out of service	Project Execution Unit and Barbados Water Authority
G-02	Emergency bypass condition confirmed, sluice gate status established, spill protocol confirmed or prepared	Construction adjacent to the operating plant	Barbados Water Authority (bypass and spill protocol); Ministry of Transport and Works Drainage Unit (sluice gate operation)
G-03	Notification protocol agreed, listing who is notified, in what order and within what time	Commencement of works	Project Execution Unit
G-04	Temporary treatment or storage arrangements confirmed for bypassed flow	First planned bypass	Project Execution Unit
G-05	Future configuration of the existing wetland conveyance settled	Any works affecting the conveyance	Barbados Water Authority, with Critical Habitat review
G-06	Construction footprint confirmed and no-go boundaries demarcated on the ground	Any clearance, excavation or temporary works at the new facility	Project Execution Unit, pre-mobilization inspection
G-07	Erosion and sediment controls installed at the wetland interface and along runoff pathways	Any significant ground disturbance	HSE Representative, with PEU verification
G-08	Habitat-Sensitive Construction Method Statement approved and demonstrated consistent with the Critical Habitat Assessment	Any ground-disturbing activity	Project Execution Unit
G-09	Conservation-priority vegetation identified and marked within areas proposed for clearance	Vegetation clearance	Qualified ecologist, recorded in the monitoring log
G-10	Hazardous material storage and refueling sited away from drainage pathways and bunded	Delivery of fuels or chemicals to site	HSE Representative
G-11	Spill response arrangements in place, recognizing Graeme Hall as Critical Habitat, with notification contacts confirmed	Delivery of fuels or chemicals to site	Project Execution Unit
G-12	Sludge and screenings disposal route	First removal from site	Environmental Protection

Gate	Condition	Governs	Verified by
	confirmed and authorized		Department
G-13	Odor and hydrogen sulfide monitoring in place with alarm thresholds set	Works on live process units	Contractor, verified by the PEU
G-14	Traffic Management Plan approved, wardens trained, school-hour transit restriction in force	First heavy vehicle movement on the community access route	Project Execution Unit and Supervising Consultant
G-15	Grievance Redress Mechanism operational, publicized in the community, confidential pathway established	Mobilization	Project Execution Unit
G-16	Workforce inducted on the Code of Conduct, including prohibited conduct and sanctions	Site access for any worker	Contractor, records auditable by the PEU
G-17	Groundwater quality baseline established at agreed monitoring points	Commencement of aquifer recharge	Environmental Protection Department and Barbados Water Authority
G-18	Reclaimed water quality specification agreed with the regulator for recharge and for irrigation	Commencement of reuse	EPD, Barbados Water Authority, Ministry of Agriculture
G-19	Low-spill lighting design confirmed at the wetland interface	Installation of permanent lighting	Project Execution Unit
G-20	Commissioning risk assessment approved, covering tie-ins, flow transfer, effluent quality, power failure and contingency storage	Commissioning	Project Execution Unit
G-21	Emergency Response Plan tested and contacts verified	Commissioning and operation	Contractor and Barbados Water Authority
G-22	Project Disaster and Climate Change Risk Management Plan prepared and approved, covering flooding, extreme rainfall, high winds, storm surge and heat at the plant and camp sites, with preparedness, controlled shutdown, evacuation and continuity arrangements	Commencement of construction	Project Execution Unit
G-23	Critical Habitat Assessment updated with the final design and construction method and, where it identifies impacts that need management beyond the measures in this ESMP, a Biodiversity Action Plan prepared by the Contractor and approved	Commencement of construction	Project Execution Unit

What this table shows. These are the actions that must be taken before a particular activity is allowed to start. They differ from ordinary mitigation because the lower risk ratings stated elsewhere only apply once the matching condition here has been met and checked. Until then, the higher unmitigated rating

applies. The conditions group around three moments: before anyone mobilizes to site, before the ground is first broken, and before the first bypass.

8. Environmental and Social Management Plan

This chapter sets out the management measures applying to the Program as a whole. Where a measure applies to a specific facility, it will be noted.

The chapter is arranged in five parts. The required plans and their present status are recorded first, so that a reader can establish which instruments exist, which are in draft and which are held elsewhere. The priority measures follow, being those that act on the pathways carrying the highest residual ratings. The management measures are then set out by pathway, so that every impact identified in the assessment can be traced to the control answering it. The management plans themselves follow, fourteen in number, each stating its objectives, its measures, the responsible roles and the frequency at which each measure applies. The chapter closes with the monitoring, verification and auditability provisions, which supply the indicators, the thresholds that trigger corrective action, the records that evidence each measurement, the reporting routes and the audit arrangements that apply across all of the plans.

Two conventions apply throughout. A measure is stated once, in the plan to which it belongs, and is cross-referenced where it bears on another pathway, so that a change to a measure is made in one place. And a measure is written so that compliance with it can be established by inspection of a record. Where a measure could be met in more than one way, the plan states the outcome required and the record that evidences it, leaving the method to the party accountable for delivery.

8.1. Structure and Required Plans

The table below records each management plan required for the reclamation facility and for the Project, what it contains, the pathway it gives effect to, and its present status. Plans are named consistently with the Project's other instruments so that a plan cited in one document is recognizable in another. Where a plan is retained in full elsewhere, its purpose and its relationship to this assessment are summarized here rather than left to the title alone.

Table 117 presents the environmental and social management plans required and their status. The owner and target month for each plan still to be prepared are given at Annex K, Table 217, which also lists the HSE Plan Enhancement, the Operational Continuity and Bypass Management Plan and the Sewage Spill Response Protocol.

Table** 117**: Environmental and social management plans required and their status

Plan	What it contains	Pathways	Status
Environmental and Social Management Plan	The overarching instrument. Consolidates the measures in this chapter with those specific to the plant upgrade, assigns each to a responsible party, and carries the monitoring program and the corrective action process	All	This chapter
Erosion, Sediment and Stormwater	Control selection and layout, installation sequence relative to ground disturbance, inspection regime,	PRJ-EI-01,	To be prepared by CRSEG, due January

Plan	What it contains	Pathways	Status
Management Plan	stabilization of exposed surfaces, stockpile siting and covering, wheel wash and road cleaning, and the post-rainfall inspection trigger. Stormwater attenuation is owned by the Site Drainage and Hydrological Management Plan and is cross-referenced here rather than duplicated. Construction-phase discharge is routed to the same southeast outfall and gully as the permanent system. Temporary sediment basins are construction controls and are not counted as permanent attenuation; where a construction basin is to be retained, it is handed over under the Site Drainage and Hydrological Management Plan	PRJ-EI-04	2027 within the Groundwater Protection and Monitoring Plan enhancement at Annex K. Trigger: controls in place before significant ground disturbance. Priority, given the Very High pre-mitigation rating at PRJ-EI-01
Site Drainage and Hydrological Management Plan	The drainage design demonstrating maintenance of pre-development runoff volume, rate and pathway to the Eastern Marsh, attenuation sizing, outfall energy dissipation, retention of the eastern gully as an open maintained pathway, and the demonstration required before construction approval that operation will not materially alter wetland hydrology, water quality, salinity or ecological functioning	PRJ-EI-04	To be prepared by CRSEG, due November 2026. Trigger: required before construction approval
Reclaimed Water Quality Assurance Plan	The applicable reclaimed water standard for recharge and for agricultural reuse, the multi-barrier treatment and online monitoring arrangements, the automatic diversion protocol on an off-specification result, point-of-use verification, permitted crops and application methods, and the contingency arrangement where reclaimed water does not meet specification	PRJ-EI-09	To be prepared by CRSEG. Deadline and trigger: in place before commencement of reuse, gate condition G-18. Priority, given the Very High pre-mitigation rating at PRJ-EI-09
Groundwater Protection and Monitoring Plan	The pre-recharge groundwater baseline at the recharge locations and at down-gradient abstraction points, the groundwater protection zoning applicable to each recharge point and the conditions attaching to it, and the quarterly monitoring regime against that baseline	PRJ-EI-09	To be prepared by CRSEG and approved by the Project Execution Unit and the Barbados Water Authority before ground-breaking, then updated and re-approved before operation begins; enhancement due January 2027 at Annex K. Trigger: baseline required before recharge commences, gate condition G-17
Biodiversity Management and Habitat Protection	Gives effect to the Critical Habitat Mitigation, Monitoring and Follow-up Action Matrix. Footprint demarcation and clearance control, the conservation priority vegetation register, low-spill	PRJ-EI-02, PRJ-EI-03,	To be prepared by SAEDI Consulting, due December 2026. Trigger: gate condition

Plan	What it contains	Pathways	Status
Plan	lighting design at the wetland interface, seasonal restrictions during migratory passage and breeding, the demarcated boundary and access prohibition, and the ecological watching brief	PRJ-EI-14	G-23. Gives effect to the Critical Habitat matrix
Emergency Preparedness and Spill Response Plan	Storage and refueling siting, secondary containment, spill response equipment and trained responders, the response arrangements recognizing Graeme Hall as Critical Habitat, containment and notification timeframes, and the annual response exercise	PRJ-EI-15	To be prepared by CRSEG. Deadline and trigger: spill response arrangements in place before delivery of fuels or chemicals to site, gate condition G-11, and the Emergency Response Plan tested and contacts verified before commissioning, gate condition G-21. Priority, given the High to Very High pre-mitigation rating at PRJ-EI-15
Air Quality and Dust Management Plan	Water suppression regime including intensification during the June to August Saharan dust period, stockpile and load covering, wheel wash and road cleaning, boundary screening, progressive stabilization, wind-referenced scheduling, receptor monitoring and the work stop trigger on visible dust migration	PRJ-EI-05	To be prepared by CRSEG, due January 2027. Trigger: controls in place before site clearance and earthworks begin
Noise and Vibration Management Plan	Working hours and restricted-hour limits, permitted high-noise activities, low-noise plant selection and acoustic screening, scheduling coordinated with the plant upgrade and the camp, the pre-condition survey and vibration monitoring for breaking and piling, and boundary monitoring against the WHO Community Noise Guideline values	PRJ-EI-06, PRJ-EI-03	To be prepared by SAEDI Consulting, due December 2026. Trigger: in place before noise-generating construction works begin
Odor and Bioaerosol Management Plan	Source identification at detailed design, enclosure and venting where the process configuration allows, storage and balancing operated to avoid retention periods permitting anaerobic conditions, chemical storage and dosing vapor control, boundary hydrogen sulfide monitoring read jointly with the plant upgrade record, and complaint-triggered investigation	PRJ-EI-11	To be prepared by CRSEG, due January 2027, once the process design is fixed
Solid and Hazardous Waste Management Plan	Segregation at source and collection frequency, storage siting away from the eastern boundary and the drainage pathway, bunded impermeable storage for fuels, oils and chemicals, the spoil balance, green waste routing, the authorized transport contractor and government-approved	PRJ-EI-08	Project-wide. To be prepared by CRSEG. Deadline and trigger: in place before waste is first removed from site, with the sludge and

Plan	What it contains	Pathways	Status
	disposal site, and the prohibition on burning and on disposal outside the approved route		screenings disposal route confirmed and authorized under gate condition G-12
Sludge and Residuals Management Plan	Characterization of the residual streams including chemical composition, the authorized disposal route for each, enclosed bunded storage with leachate capture, sealed transport and waste transfer documentation, and segregation of chemically dominated residues from any biosolids fraction	PRJ-EI-10	To be prepared by CRSEG, due April 2027, once the process design is fixed
Traffic and Pedestrian Management Plan	A single integrated movement plan across the reclamation facility, the plant upgrade and the workers' camp. Transit windows, speed limits, trained wardens, off-site staging, route planning, load optimization, driver induction, the movement log, daily road condition inspection and school engagement	PRJ-EI-07	Project-wide. Priority, given the Critical pre-mitigation rating at PRJ-EI-07
Chance Find Procedure	The stop-work trigger, the securing and holding arrangements for a find, the notification route to the relevant national authority through the Project Execution Unit, and the authority under which works may resume. Applied across both facilities and the camp so that one route operates on the shared site	PRJ-EI-13	To be prepared by CRSEG. Deadline and trigger: adopted before excavation begins. Required by ESPS 8
Energy and Greenhouse Gas Management Plan	The pre-commissioning emissions baseline, specific energy consumption per cubic meter of reclaimed water as a design parameter, renewable generation assessment, early permanent power connection, and annual reporting against the Contract non-carbon emissions commitment	PRJ-EI-12	To be prepared by SAEDI Consulting, due January 2027. Trigger: baseline required before commissioning
Labor Management Plan	Workforce numbers, composition and deployment profile, recruitment and procurement targets and reporting, terms and conditions, worker grievance arrangements, and the subcontractor cascade	PRJ-SI-01, PRJ-SI-02	Complete, revised 26 August 2026
Workers' Code of Conduct	Prohibited conduct, expected behavior in the community, enforced sanctions up to dismissal and removal from the Project, and the induction requirement for every person on site including short-term subcontractors	PRJ-SI-02, PRJ-SI-03	Complete, Version 2.0, July 2026
SEA, SH and GBV Prevention and Response Plan	Prevention, awareness raising for the workforce and separately for the community, confidential and anonymous reporting independent of the camp and of line management, survivor-centered referral arrangements agreed with named providers before mobilization, non-retaliation protection, supervisor	PRJ-SI-03	Project-wide. Required in force before mobilization

Plan	What it contains	Pathways	Status
	accountability and sanctions		
Community Health Plan	Persons outside the workforce and the pathways by which conditions on site reach the community, the exposure pathways specific to each facility, health service capacity coordination for the peak deployment period, and the shared emergency notification route	PRJ-SI-04	Project-wide
Stakeholder Engagement Plan	Stakeholder identification, disclosure and consultation arrangements, engagement methods for vulnerable and differentially affected groups, the notification commitments, the issues and response log, and the engagement effectiveness review	PRJ-SI-07	Project-wide
Grievance Redress Mechanism	Receipt, categorization, acknowledgment and closure timeframes, the confidential channel for SEA, SH and GBV, non-retaliation protection, and the register from which the monitoring indicators are drawn	PRJ-SI-05, PRJ-SI-07	Project-wide
Health and Safety Management Plan and HSE Management Manual	Occupational health and safety for the workforce, the permit-to-work system, the natural hazard profile and the emergency arrangements. Occupational exposure remains under these instruments; community consequences are managed under the Community Health Plan	PRJ-SI-04	HSE Management Manual Revision 2 and Health and Safety Management Plan Revision 2, 27 August 2026

8.2. Priority Measures

The measures below are conditions to be met before the activities they govern proceed. They are distinguished from the recurring controls at the measures by pathway because they are done once, at a defined point, and because the residual ratings recorded in the impact assessment depend on them. A pathway rated Low after mitigation can still carry a high management priority where its rating rests on a single pre-condition that must not be missed.

Table 118 presents the priority measures, timing and responsibility.

Table** 118**: Priority measures, timing and responsibility

Measure	Timing	Responsible
Confirm the applicable national standard for reclaimed water quality for aquifer recharge and for agricultural reuse, applying WHO guidance on the safe use of wastewater in agriculture as the interim reference until it is settled	Before commissioning	Barbados Water Authority with the Environmental Protection Department, confirmed to the Project Execution Unit
Establish the groundwater quality baseline at the recharge locations and at down-gradient abstraction	Before recharge	Designer, confirmed by the

Measure	Timing	Responsible
points, and verify the groundwater protection zoning applicable to each recharge point	commences	Barbados Water Authority
Demonstrate that the site drainage design maintains pre-development runoff volume, rate and pathway to the Eastern Marsh, and that operation will not materially alter wetland hydrology, water quality, salinity or ecological functioning	Before construction approval	Designer, confirmed by the Barbados Water Authority
Install erosion and sediment controls and confirm them adequate at the Project and wetland interface	Before significant ground disturbance	Contractor, verified by the Project Execution Unit
Confirm the future configuration of the existing wetland conveyance as a single decision recorded for both components, and where removal is proposed obtain Critical Habitat review before implementation	Before works affecting the conveyance	Designer and Barbados Water Authority
Confirm and demarcate the final construction footprint, and complete the pre-clearance survey identifying conservation priority vegetation including the lignum-vitae confirmed at station FV-01	Before vegetation clearance	Contractor with ecological supervision
Agree the lighting design at the wetland interface, low-spill, directed away from wetland habitat, warm spectrum and shielded, using the minimum illumination required for safety and security	At detailed design, verified at commissioning	Designer, confirmed by the Project Execution Unit
Obtain engineering confirmation of emergency containment, overflow and plant failure arrangements	Before operation	Designer, confirmed by the Barbados Water Authority
Establish secondary containment and spill response equipment, with response arrangements explicitly recognizing Graeme Hall as Critical Habitat	Before chemical or fuel delivery to site	Contractor
Adopt the single integrated Traffic and Pedestrian Management Plan across the reclamation facility, the plant upgrade and the workers' camp, including school-sensitive transit windows	Before full construction mobilization	Contractor, overseen by the Project Execution Unit
Bring the SEA, SH and GBV Prevention and Response Plan into force, with survivor referral arrangements agreed with named local providers and confidential reporting channels operating	Before mobilization	Contractor with the Project Execution Unit
Confirm the Contractor's position on the employment of women in writing, since a stated intention not to hire women engages the Employment (Prevention of Discrimination) Act 2020 and ESPS 9	Before this Environmental and Social Management Plan is finalized	Project Execution Unit with the Contractor
Adopt the Chance Find Procedure and induct all excavation personnel and machine operators in it	Before excavation begins	Contractor
Establish the greenhouse gas emissions baseline and add carbon dioxide, methane and other greenhouse	Before commissioning	Contractor with the Project

Measure	Timing	Responsible
gases to the Project monitoring program		Execution Unit
Characterize the process residual streams including chemical composition, and confirm an authorized disposal route for each	At detailed design, before commissioning	Designer and Contractor

8.3. Management Measures by Pathway

The table below carries the recurring controls. Each is stated with the frequency at which it is applied, the role responsible for applying it, the indicator by which its performance is judged, and the trigger at which corrective action is required. The measures derive from the mitigation summary and residual management fields of the impact tables and do not add to them; where the two differ, the impact table governs. Measures that are conditions rather than recurring controls appear at the priority measures above and are not repeated here.

Table 119 presents the management measures by pathway.

Table** 119**: Management measures by pathway

Ref	Control	Frequency	Responsible	Indicator	Corrective action trigger
PRJ-EI-01	Erosion and sediment control inspection and maintenance; stabilization of exposed surfaces; stockpile covering; wheel wash and road cleaning	Weekly, and after each rainfall event exceeding the established trigger	Contractor HSE	WM-01 turbidity and suspended solids at the wetland margin	Any observed sediment release; corrective action within 24 hours
PRJ-EI-02	Clearance confined to the approved footprint; conservation priority vegetation register maintained	Monthly verification	Contractor with ecological supervision	WM-03 cleared area against the approved extent	Any clearance outside the approved extent
PRJ-EI-03	Low-spill lighting maintained as designed; demarcated wetland boundary; seasonal restrictions where sensitive fauna activity is identified	Boundary inspected monthly; lighting verified at commissioning and annually	Contractor with ecological supervision	WM-04 night-time light spill at the wetland boundary; WM-05 boundary integrity	Any access beyond the demarcated boundary; any measured spill above the design value
PRJ-EI-04	Drainage and attenuation maintained as designed; eastern gully kept open and maintained	Quarterly, and after each major rainfall event	Contractor, then Barbados Water Authority in operation	WM-02 flow and water level at the eastern gully outfall	Any measured departure from the design regime
PRJ-	Water suppression, covered stockpiles and	Daily during earthworks;	Contractor	WM-06 particulate matter at	Visible dust migration

Ref	Control	Frequency	Responsible	Indicator	Corrective action trigger
EI-05	loads, wheel wash, boundary screening, progressive stabilization, wind-referenced scheduling	intensified June to August	HSE	community and school receptors; WM-07 wetland margin deposition	beyond the boundary toward a residential, school or wetland receptor
PRJ-EI-06	Working hours and restricted-hour limits; low-noise plant and acoustic screening; scheduling coordinated with the plant upgrade and the camp	Continuous; monitoring monthly and on complaint	Contractor HSE	WM-08 noise at residential and school boundaries	Any sustained Project-attributable exceedance of the WHO Community Noise Guideline values
PRJ-EI-07	Transit windows, speed limits, trained wardens, off-site staging, route planning, load optimization, driver induction, daily road condition inspection	Continuous; compliance audit weekly	Contractor logistics, overseen by the Project Execution Unit	WM-09 heavy vehicle movements within restricted school-hour windows; WM-10 pedestrian near misses	Any pedestrian near miss; any movement within a restricted window
PRJ-EI-08	Segregation at source; bunded impermeable storage for fuels, oils and chemicals; authorized transport and government-approved disposal; perimeter inspection	Storage weekly and after rainfall; records reconciled monthly	Contractor HSE	WM-11 waste transfer records reconciled against arisings; WM-12 perimeter and gully condition	Any unaccounted waste stream; any evidence of dumping at the wetland margin
PRJ-EI-09	Multi-barrier treatment with online monitoring of surrogate parameters and automatic diversion on an off-specification result; point-of-use verification	Continuous online; point-of-use before each irrigation season; groundwater quarterly	Barbados Water Authority as operator	WM-13 reclaimed water quality at the facility outlet; WM-14 groundwater quality against the pre-recharge baseline; WM-15 reclaimed water quality at each point of use	Any exceedance of the applicable standard; reuse suspended until the cause is identified and corrected
PRJ-EI-10	Enclosed bunded storage with leachate capture; sealed transport by an authorized contractor; segregation of chemically dominated residues	Storage weekly and after rainfall; records monthly; characterizatio n annually and after any	Barbados Water Authority as operator	WM-16 residual quantities and disposal records	Any disposal outside the authorized route; any change in residual character not reflected in the

Ref	Control	Frequency	Responsible	Indicator	Corrective action trigger
		process change			disposal routing
PRJ-EI-11	Odor sources enclosed or vented as designed; storage and balancing operated to avoid anaerobic retention; chemical storage and dosing vapor control	Continuous; monitoring reported monthly	Barbados Water Authority as operator	WM-17 hydrogen sulfide at the site boundary and the nearest community receptor, read jointly with the plant upgrade record; WM-18 odor complaints and response times	Any exceedance of the odor-based alarm threshold; any complaint not closed within seven days
PRJ-EI-12	Energy efficiency maintained as designed; generator running minimized; haulage trips optimized under the integrated movement plan	Metered monthly; reported annually	Contractor, then Barbados Water Authority in operation	WM-19 specific energy consumption per cubic meter of reclaimed water; WM-20 greenhouse gas emissions against the Contract non-carbon commitment	Any sustained departure from the design specific energy consumption
PRJ-EI-13	Chance Find Procedure operating; induction recorded for every person engaged in ground works	Induction on arrival; procedure reviewed annually and after any activation	Contractor HSE	WM-21 chance find register and induction records	Any find; works suspended in the affected area until written resumption authority is given
PRJ-EI-14	Works on the conveyance only under a supervised method statement, within a demarcated corridor and outside the migratory and breeding periods	Continuous during any works; reinstatement verified at completion and at six months	Contractor with ecological supervision	WM-22 turbidity at the works interface and downstream; WM-23 reinstatement condition	Any works commenced without completed Critical Habitat review
PRJ-EI-15	Secondary containment inspection; spill response equipment maintained; response arrangements exercised	Containment weekly; response exercise annually	Contractor HSE, then Barbados Water Authority in operation	WM-24 containment integrity and response exercise records	Any release, however contained; notification within four hours to the Project Execution Unit, the Environmental Protection

Ref	Control	Frequency	Responsible	Indicator	Corrective action trigger
					Department and the Coastal Zone Management Unit
PRJ-SI-01	Recruitment advertised through channels reaching women; sex-disaggregated recruitment, retention and pay reporting; reserved training places; procurement lots sized for small local suppliers	Monthly reporting; quarterly review	Contractor human resources, overseen by the Project Execution Unit	WM-25 workforce composition and local content, disaggregated by sex and role	Female share falling below the Labor Management Plan commitment; any recruitment grievance upheld
PRJ-SI-02	Worker-community interaction protocol; Code of Conduct induction and enforcement; multilingual communication; camp self-sufficiency in water, food and welfare	Induction on arrival; complaints reviewed monthly; protocol reviewed quarterly	Contractor HSE and camp management	WM-26 community complaints and concerns, disaggregated by sex and subject; WM-27 Code of Conduct breaches and their outcomes	Any pattern of complaint indicating the protocol is not holding
PRJ-SI-03	SEA, SH and GBV Prevention and Response Plan in force; confidential reporting independent of the camp and line management; survivor referral; non-retaliation protection; supervisor accountability	Continuous; awareness raising quarterly; case handling audited annually	Project Execution Unit, with case handling independent of the Contractor	WM-28 reporting-pathway effectiveness, assessed separately from its existence, covering awareness, accessibility barriers, preferred channels, fear of retaliation and differences in access between groups	Any substantiated breach; a low grievance count treated as an open question and investigated, not reported as success
PRJ-SI-04	Community Health Plan delivered; vector controls; shared emergency notification route operating; health service capacity coordinated for peak deployment	Standing water weekly and after rainfall; grievances reviewed monthly with the Ministry of Health	Contractor HSE with the Ministry of Health	WM-29 standing water and vector breeding sites; WM-30 health-related grievances, disaggregated by sex and age	Any breeding site not eliminated within 24 hours of identification; any event capable of reaching persons outside the workforce
PRJ-SI-05	Access to vendor locations, businesses, residences and the wetland maintained, with	Access verified at each monthly site inspection;	Contractor logistics with the Project	WM-31 livelihood-related grievances, disaggregated by sex and by vendor,	Any access interruption without an agreed

Ref	Control	Frequency	Responsible	Indicator	Corrective action trigger
	alternatives agreed in advance; advance notice of works affecting access; local procurement	price and rental baseline re-measured at peak deployment	Execution Unit	fisher, business and accommodation-provider status	alternative; any income-loss claim not assessed within the target closure time
PRJ-SI-06	Construction programs coordinated so that the highest-impact activities on the three footprints do not coincide; consolidated community notification; joint monitoring at shared receptors	Program reviewed monthly against the complaint pattern	Project Execution Unit	WM-32 combined complaint register across the three components, disaggregated by sex and age	Any repeated or unresolved nuisance complaint from the same receptor
PRJ-SI-07	Engagement addressing the concerns on the record in the terms residents raised them; sessions timed for attendance after working hours; monitoring results published in non-technical form	Each engagement round; effectiveness reviewed after each round	Project Execution Unit	WM-33 grievances received, resolved and outstanding, disaggregated by sex and group; WM-34 engagement effectiveness against the four review questions	A negative answer to any of the four engagement review questions

8.4. Management Plans

8.4.1. Reclaimed Water Quality Assurance Plan

This plan establishes protocols to ensure reclaimed water produced by the facility meets national and international standards for reuse. It covers treatment, monitoring, reporting, and corrective actions, with emphasis on protecting public health, ecosystems, and infrastructure.

The Facility Manager is accountable for revising the Reclaimed Water Quality Assurance Plan as commissioning results, laboratory results, regulatory conditions, operational experience and reuse specifications become available. The QA Team shall maintain version-controlled sampling plans, action limits, chain-of-custody procedures, corrective-action records and a periodic review register. No operational release of reclaimed water for a reuse pathway shall occur before the applicable quality verification and approval gates are satisfied.

Governance & Responsibilities

- **Facility Manager:** Overall accountability for reclaimed water quality.

The Facility Manager owns the reclaimed-water risk register, authorises process isolation and corrective actions, assigns accountable action owners and deadlines, and verifies documented closure; the

Laboratory/QA Team provides independent test evidence and the Environmental and Social Safeguards Unit tracks any community or regulatory notification.

- **Laboratory & QA Team:** Conduct sampling, testing, and verification.
- **Operations Team:** Maintain treatment processes and corrective actions.
- **Environmental & Social Safeguards Unit:** Ensure compliance with ESMP and stakeholder communication.
- **Regulatory Liaison:** Coordinates with Water Authority and Environmental Protection Department.

Treatment & Quality Standards

- **Treatment Processes:**
    - Primary: Screening and sedimentation.
    - Secondary: Biological treatment (activated sludge, MBR).
    - Tertiary: Filtration, disinfection (UV/chlorination).
- **Target Standards (example values):**
    - **Turbidity:** ≤ 2 NTU.
    - **BOD:** ≤ 10 mg/L.
    - **TSS:** ≤ 10 mg/L.
    - **Fecal Coliforms:** ≤ 200 CFU/100 mL.
    - **Residual Chlorine:** 0.5–2.0 mg/L.

Monitoring & Sampling Protocols

- **Frequency:**
    - Daily: Turbidity, chlorine residual.
    - Weekly: BOD, TSS, coliforms.
    - Quarterly: Heavy metals, nutrients, hydrocarbons.
- **Sampling Points:**
    - Post-treatment discharge.
    - Distribution pipelines.
    - End-use locations (irrigation, industrial reuse).
- **Methods:**
    - Standard Methods for the Examination of Water and Wastewater.
    - Accredited laboratory testing.

Quality Assurance & Control

- **Calibration:** Instruments calibrated monthly.
- **Duplicate Samples:** 10% of samples duplicated for QA.
- **External Audits:** Annual third-party verification.
- **Data Management:** Results logged in Water Quality Register.

Risk Management & Corrective Actions

- **Non-Compliance Response:**
    - Immediate notification to regulators (Regulatory Liaison, on the instruction of the Facility Manager).
    - Halt distribution until corrective measures applied (Facility Manager).
    - Root cause analysis and corrective action plan (Operations Team with the Laboratory & QA Team, approved by the Facility Manager and reported to the Environmental & Social Safeguards Unit).
- **Emergency Protocols:**
    - Deploy portable disinfection units (Operations Team).
    - Divert noncompliant water to safe disposal (Operations Team, with the Facility Manager's approval).

Stakeholder Communication

- **Public Notification:**
    - Advisories issued if reclaimed water fails standards.
- **Grievance Redress:**
    - Community feedback channels integrated into ESMP.
- **Transparency:**
    - Quarterly water quality reports published.

Continuous Improvement

- Annual review of monitoring data.
- Update treatment technologies based on performance.
- Integrate climate resilience (rainfall variability, drought).

Table 120 presents the reclaimed water quality assurance summary matrix.

Table** 120**: Reclaimed Water Quality Assurance Summary Matrix

Parameter	Standard	Frequency	Responsible	Corrective Action

Turbidity	≤ 2 NTU	Daily	Lab Team	Adjust filtration
BOD	≤ 10 mg/L	Weekly	Lab Team	Optimize aeration
TSS	≤ 10 mg/L	Weekly	Lab Team	Improve sedimentation
Coliforms	≤ 200 CFU/100 mL	Weekly	Lab Team	Intensify disinfection
Chlorine Residual	0.5–2.0 mg/L	Daily	Operators	Adjust dosing
Heavy Metals	≤ regulatory limits	Quarterly	Lab Team	Source control

8.4.2. Groundwater Protection and Monitoring Plan

This plan establishes measures to protect groundwater resources (including aquifers and wells) from contamination, while managing erosion, sediment transport, stormwater, and site drainage. It applies to all construction and operational phases, ensuring compliance with ESPS-3 (Resource Efficiency and Pollution Prevention) and ESPS-6 (Biodiversity Conservation).

Development and approval. This section sets out the required content of the Plan; it is not yet the full Plan. The Contractor will develop the full Groundwater Protection and Monitoring Plan and submit it to the Project Execution Unit and the Barbados Water Authority for approval before ground-breaking. It will contain the location and construction of monitoring wells, the pre-construction baseline (at least two rounds of sampling, wet and dry season where the program allows), the parameters, sampling frequency and analytical methods, action levels and the response to an exceedance, and reporting. The Plan will be updated with construction-phase results and the operating regime of the reclaimed water facility, and the updated Plan will be approved before operation begins, when responsibility passes to the Barbados Water Authority as operator. Its preparation is a condition to be met before ground-breaking.

Governance & Responsibilities

- **Project Environmental Manager (PEM):** Oversees groundwater monitoring and compliance.
- **Site Engineers:** Implement erosion, sediment, and drainage controls.
- **Health & Safety Officers:** Ensure safe handling of chemicals and wastewater.
- **Contractors:** Maintain stormwater BMPs (Best Management Practices).
- **Regulatory Liaison:** Coordinates with Water Authority and environmental regulators.

Groundwater Protection Measures

- **Wellhead Protection:**
    - Establish exclusion zones around boreholes and aquifers.
    - No fuel/chemical storage within 50 m of groundwater recharge zones.
- **Chemical & Fuel Storage:**
    - Bunded storage areas with impermeable liners.

- Spill kits and secondary containment.

- **Wastewater Management:**
  - On-site treatment (e.g., MBR plant) before discharge.
  - Reuse treated effluent for irrigation where feasible.
- **Monitoring Wells:**
  - Install piezometers upstream and downstream of site.
  - Quarterly sampling for nitrates, heavy metals, hydrocarbons, and pathogens.

Erosion & Sediment Control

- **Site Stabilization:**
  - Vegetative cover on exposed soils.
  - Geotextiles and mulching for slopes.
- **Sediment Barriers:**
  - Silt fences, sediment basins, and check dams.
- **Construction Practices:**
  - Limit earthworks during rainy season.
  - Progressive backfilling and compaction.

Stormwater & Site Drainage

- **Drainage Design:**
  - Separate clean stormwater from contaminated runoff.
  - Use lined channels and culverts to direct flows.
- **Stormwater BMPs:**
  - Oil-water separators on runoff from fuel, chemical and vehicle areas, and at drainage outfalls.
  - Flow attenuation, including any detention or retention facility, is sized and specified under the Site Drainage and Hydrological Management Plan; this Plan is limited to treatment best management practices and monitoring. Bunded and covered storage, and spill response kits and procedures, apply to fuel, chemical and vehicle areas. Infiltration of untreated runoff from process or hazardous-material areas is prohibited, and where the Site Drainage and Hydrological Management Plan provides a detention or retention facility that facility is not used for infiltration to groundwater unless approved under this Plan.
- **Inspection Protocols:**

- Weekly checks of drains, culverts, and sediment traps.
- Document inspections in Permit & Approval Register.

Monitoring & Reporting

- **Parameters:**
  - Groundwater: pH, turbidity, nitrates, hydrocarbons, heavy metals.
  - Stormwater: suspended solids, COD/BOD, oil & grease, sampled at the southeast outfall.
- **Frequency:**
  - Groundwater: quarterly.
  - Stormwater: monthly during rainy season, quarterly otherwise.
- **Reporting:**
  - Results submitted to Water Authority and included in ESMP monitoring reports.
  - Non-compliance triggers corrective action within 14 days.

Emergency Response

- **Spill Response:**
  - Immediate containment with absorbent materials.
  - Notify Water Authority within 2 hours.
- **Bypass Events:**
  - Document cause, duration, and mitigation.
  - Deploy portable treatment units if feasible.

Continuous Improvement

- Annual review of monitoring data to identify trends.
- Update erosion and drainage designs based on climate projections.
- Integrate lessons learned into future ESMP revisions.

Table 121 presents the groundwater protection and monitoring summary.

Table** 121**: Groundwater Protection and Monitoring Summary

Risk Area	Control Measures	Monitoring	Responsible
Groundwater	Wellhead exclusion, bunded storage	Quarterly sampling	PEM
Erosion	Vegetative cover, silt fences	Weekly site checks	Site Engineers
Sediment	Sediment basins, check dams	Monthly inspections	Contractors

Stormwater	Retention ponds, oil-water separators	Monthly/seasonal sampling	Env. Unit
Drainage	Lined channels, culverts	Weekly inspections	Site Engineers

8.4.3. Emergency Preparedness and Spill Response Plan

Introduction

This plan reflects the company's commitment to safeguarding life, property, and the environment, while embedding safety as a core workplace priority. Without preparedness, organizations risk disruption, damage, and harm to personnel.

China Railway Shanghai Engineering Group recognizes that operations at the workers' camp face diverse hazards, land-based, environmental, and operational, including fire, flooding, hazardous spills, chemical releases, unsafe conditions, and medical emergencies. This plan provides a structured framework for detection, reporting, containment, and coordination with external responders to protect workers and nearby communities.

A site-specific risk is grass fire, given the dry scrub and reed-fringed wetland adjoining the camp. Ignition sources such as cooking, smoking, hot works, vehicles, and electrical installations heighten vulnerability, with potential impacts on accommodation blocks, neighboring residences, and ecosystems.

Beyond fire, preparedness extends to flooding, severe weather, chemical or fuel spills, medical emergencies, and unsafe conditions, each requiring clear procedures to ensure rapid, effective response.

The Project HSE Officer shall maintain an electronic hazard register for the direct and indirect area of influence, with incident date, location, hazard type, rainfall/wind or other measurement where available, affected assets/receptors, response actions, photographs, source, corrective actions and closure evidence. Review frequency shall be quarterly during active works, with six- and twelve-month trend summaries and an immediate update after any material flood, storm, heat or access-disruption event. Records shall be retained under the ESMP document-control system.

Scope

This Emergency Response Plan applies to the upgrade of the South Coast Sewage Treatment Plant, the construction and operation of the South Coast Water Reclamation and Re-use Facility, and the workers' campsite that serves both, all of which occupy the same land parcel at Graeme Hall, Christ Church. It addresses potential emergencies, including operational emergencies and natural hazards, that may affect any of those activities. The plan sets out the actions to be taken to control, respond to, and recover from such events. Provisions written for conditions inside the campsite are retained and identified as such, and they apply alongside the measures governing the two facilities.

Authority

- **Project Manager:** Has overall authority for implementation of this plan and is responsible for ensuring that adequate resources are made available for its effective execution.
- **Operations Manager:** Is responsible for implementing the plan at the camp site, coordinating with management and the HSE team, and identifying personnel to serve as wardens.
- **HSE Officer:** Monitors, reviews, and updates the plan as required. The HSE Officer also supports emergency coordination and works with management to notify the relevant authorities when necessary.
- **Wardens:** Are responsible for assisting personnel during emergencies, directing evacuation where required, and helping to ensure that all persons reach the designated muster point safely.

Emergency contacts for the camp are listed in Table 122.

Table** 122**: Emergency Contact

Contact	Number
Project Manager	246-850-3666
HSE Manager	Wu Dequan (HSE Officer) +1 (246) 850-2192
Construction Manager	246-825-0987
Barbados Department of Emergency Management	246-438-7575
Police	211
Fire	311
Ambulance	511
South Coast Sewage Treatment Plant Control Room	246-434-4220

8.4.3.1. Class of Emergencies

For this ERP, emergencies are divided into two classes:

Class 1 Emergencies: These are emergencies arising directly from camp operations. Examples include:

- Fire
- Medical emergencies, including struck-by injuries
- Oil and chemical spills
- Wastewater system or biohazard breaches

Class 2 Emergencies: These are emergencies outside the direct control of the company, but which may affect the workers' camp. Examples include:

- Hurricanes and tropical storms
- Coastal flooding and storm surge
- Seismic activity and volcanic ashfall

- Excessive heat

8.4.3.2. Preparation for Emergencies

To prepare for the emergencies identified in this document, the company will implement the following measures:

Evacuation routes, assembly point and drills. The camp evacuation routes and emergency assembly points are shown in the evacuation map in Section 8.4.13.13. Because the camp sits at the foot of a slope, the map is to be confirmed by the Contractor to show the safe high ground used in a flood, together with the exit routes from each building. The HSE Officer is responsible for the evacuation plan and the Camp Manager for keeping routes clear and signed. Every worker is briefed on the map at induction, and evacuation drills are held at least every six months and before each hurricane season, with attendance and the time to complete the headcount recorded.

Community safety indicator. Fatal and serious accidents involving members of the community that are linked to Project activities are recorded as a separate indicator (target zero), reported to the Project Execution Unit within 24 hours and reviewed in the quarterly monitoring report.

- Conduct emergency drills at least twice each year.
- Ensure that employees receive appropriate training in first aid, fire safety, and spill response.
- Maintain Safety Data Sheets (SDS) for all hazardous materials stored on site.
- Display the emergency contact list prominently on the notice board.
- Ensure that first aid kits, eyewash stations, and emergency showers are available, maintained, and in working condition.
- Establish and maintain a positive working relationship with the nearby existing facility and relevant emergency services.
- Designate a vehicle for use during emergencies where transportation is required.

Emergency response equipment

The Camp will have the following equipment that will be used for any Emergency Response:

The emergency response vehicles and equipment to be held on site are listed in Table 123.

Table** 123**: Emergency Response Equipment

CRSEG confirmed in November 2026 that the equipment listed in Table 123 will be updated in line with the final design before construction begins.

Vehicle/Equipment Type	Quantity	Identification Number
Fire Extinguishers	Set at mobilization against the facility layout and the workforce on site	Assigned in the equipment register at mobilization
First Aid Kits	Set at mobilization against the facility layout and the workforce on site	Assigned in the equipment register at mobilization
Passenger Car / Pick Up	Set at mobilization against the facility layout and the workforce on site	Assigned in the equipment register at mobilization
Fire Hose	Set at mobilization against the facility layout	Assigned in the equipment

Vehicle/Equipment Type	Quantity	Identification Number
	and the workforce on site	register at mobilization
Excess Water	Set at mobilization against the facility layout and the workforce on site	Assigned in the equipment register at mobilization
Disposable Personal Protective Equipment (PPE)	Set at mobilization against the facility layout and the workforce on site	Assigned in the equipment register at mobilization
Respirators	Set at mobilization against the facility layout and the workforce on site	Assigned in the equipment register at mobilization
Dust Masks	Set at mobilization against the facility layout and the workforce on site	Assigned in the equipment register at mobilization
Water Pumps	Set at mobilization against the facility layout and the workforce on site	Assigned in the equipment register at mobilization
Spill kits	Set at mobilization against the facility layout and the workforce on site	Assigned in the equipment register at mobilization

Quantities and identification numbers are fixed at mobilization, when the facility layout and the workforce on site are known, and are recorded in the emergency equipment register. The register is verified before works begin, checked at the monthly inspection, and reconciled after any use of the equipment so that depleted items are replaced before the next shift.

Procedures for Class 1 Emergencies

Fires

If a fire is detected, the alarm must be raised immediately, and the Fire Service must be contacted without delay.

- Once the alarm has been activated, all work must stop, and all personnel must proceed to the nearest muster point.
- Where it is safe to do so, isolate electrical power at the main board.
- Designated fire wardens must sweep the area, where safe, to confirm that no one remains in the danger zone.
- If the fire is small and the responder has been trained, the fire warden may attempt to extinguish it using the appropriate firefighting equipment. Dry chemical or CO2 extinguishers must be used for electrical or grease fires.
- At the muster point, the designated person must conduct a headcount of all personnel.
- No one may leave the muster point or re-enter the area until authorized to do so.

Spills

Oil & Chemical Spill

Small spill

- The spill is less than 25 gallons and remains within the site boundary.
- The clean-up can be carried out without creating a safety or health hazard.
- The discharge can be readily contained.

Suitable spill response equipment is available for immediate use. Large spills

- The spill exceeds 25 gallons and/or extends beyond the site boundary.
- There is potential for the spill to enter nearby waterways or drainage systems.
- The discharge cannot be readily contained using available on-site resources.
- Response requires specialized training and equipment.
- The incident poses a risk to human health or the environment.
- A person has been injured or exposed.

Table 124Table 124 presents the small spill procedure; the large spill procedure follows it.

Table 124***: Small and large spills procedure***

Procedure for small spills	**Who to contact**
• If persons are working in the affected area, stop work and evacuate them from the spill zone. • Cordon off the area to prevent unauthorized access. • Where safe to do so, stop the source of the spill and use the spill kit to prevent the material from reaching drains or other sensitive areas. • Notify the relevant personnel as soon as possible. • Follow the instructions provided in the applicable SDS for safe handling and clean-up. • Clean up the spill and place all waste generated in sealed containers or plastic bags that are properly labeled. Consult the relevant authority regarding disposal requirements where necessary. • Complete the incident report form within 24 hours of the incident.	• Immediate Supervisor • Project / Operations Manager HSE Officer
Procedure for large spills	**Who to contact**
• Stop work in the affected area, evacuate personnel, and confirm whether anyone has been injured or exposed. • Cordon off the area to prevent unauthorized access. • Call the appropriate emergency responders, including the Fire Service, emergency medical personnel, and the Police, where required. • Notify the Immediate Supervisor and other relevant personnel without delay. Notify the relevant environmental authority of the incident, where applicable. Where it is safe to do so, take immediate action to control and	• Immediate Supervisor • Project / Operations Manager HSE Officer • Relevant environmental authority Emergency services, as required
• Contain the spill. When responders arrive, provide key information	???????

Procedure for small spills	Who to contact
• If persons are working in the affected area, stop work and evacuate them from the spill zone. • Cordon off the area to prevent unauthorized access. • Where safe to do so, stop the source of the spill and use the spill kit to prevent the material from reaching drains or other sensitive areas. • Notify the relevant personnel as soon as possible. • Follow the instructions provided in the applicable SDS for safe handling and clean-up. • Clean up the spill and place all waste generated in sealed containers or plastic bags that are properly labeled. Consult the relevant authority regarding disposal requirements where necessary. • Complete the incident report form within 24 hours of the incident.	• Immediate Supervisor • Project / Operations Manager HSE Officer
including the location of the spill, the time it was observed, the type of material released, any injuries or damage, nearby chemicals, and any other relevant site conditions. • All waste generated from the clean-up must be placed in sealed, properly labeled containers or bags and disposed of in accordance with applicable requirements. • Complete the incident report form within 24 hours. If required, submit copies to the relevant authority. Where an injury has occurred, ensure all mandatory notifications and follow-up investigations are completed.	

Large spill procedure. A large spill is one that exceeds 25 gallons, extends beyond the site boundary, may reach a drain, the canal or the Graeme Hall Swamp, needs specialized equipment or poses a risk to people. The person who discovers it raises the alarm and, only if it is safe to do so, stops the source; the area is cleared and cordoned off and ignition sources are removed.

The HSE Officer takes control on site, calls the Barbados Fire Service (311) where there is a fire or toxic risk, and deploys booms, drain covers and absorbents to stop the spill reaching drains, the canal or the wetland, giving priority to the outfall and the wetland conveyance.

The HSE Officer notifies the Project Execution Unit and the Environmental Protection Department immediately, and the Barbados Water Authority where water supply, sewers or groundwater may be affected. A licensed hazardous waste contractor recovers the spilled material and contaminated soil, which are handled as hazardous waste under Section 8.4.5.

Once the spill is contained, soil, water and drains in the affected area are sampled to confirm clean-up, a written incident report is submitted to the Project Execution Unit within 24 hours, and the cause, response and corrective actions are entered in the incident register. The response follows the chemical spill emergency procedure of the Contractor's HSE Management Manual (Annex J).

Wastewater system and biohazard breach

A rupture or overflow of the independent three-stage sedimentation tanks presents an immediate public health and environmental hazard and must be treated as a priority emergency.

- Immediately isolate inflow by closing the relevant isolation and bypass valves on the affected sedimentation system to prevent further sewage accumulation from the dormitory bathrooms.
- Establish a containment and exclusion zone by erecting temporary barriers around the affected area. Restrict access to authorized personnel wearing appropriate biohazard PPE, including rubber boots, waterproof coveralls, nitrile gloves, and face shields.
- Deploy suitable pumping equipment to transfer the spilt effluent to an approved collection or disposal system, in accordance with site and regulatory requirements.
- Disinfect the contaminated soil and hard surfaces using an appropriate chlorine or bleach solution to reduce biological risk and control harmful gases.

Medical emergency

If a person is injured on site, the severity of the injury must be assessed immediately so that an appropriate response can be initiated.

- For minor injuries, treatment may be provided by a trained first aider on site.
- For serious injuries, the first aider must provide immediate assistance within the limits of their training and stabilize the injured person until emergency medical services arrive.
- If stabilization is not possible, continue to monitor the injured person and provide clear information to paramedics on arrival.
- Where necessary, contact the nearest health facility or ambulance service without delay.

Class 2 Emergencies

Hurricanes & tropical storms

Pre-Impact phase (48–72 hours before landfall)

- **Secure prefabricated structures:** Inspect and tighten all structural tie-downs, anchors, and roof components of the prefabricated office and accommodation units.
- **Remove loose objects:** Relocate loose materials from outdoor areas, including work zones and recreation spaces, into secure buildings to prevent them from becoming wind-borne hazards.
- **Clear drainage systems:** Inspect and clear rainwater catch pits and sedimentation tanks to maximize drainage capacity before the storm.

During the Event

- **Shelter in place or evacuate:** Prefabricated camp structures are generally not suitable shelters for major hurricanes. Where a severe hurricane is forecast, the Project Manager must arrange full camp evacuation to a designated approved shelter before storm-force winds begin.

Coastal flooding & storm surge

Although Barbados is above sea level, the workers' campsite is located at the bottom of a slope, so severe flooding or storm surge may still affect site drainage and access routes. If flooding does occur, the following actions should be taken:

- **Isolate wastewater systems:** In a severe surge event, close the relevant isolation valves to reduce the risk of backflow into camp sanitation systems.
- **Move to higher ground:** If floodwater enters the site, all personnel must move immediately to the safest available higher ground or evacuate by the safest accessible route, if instructed to do so.

Volcanic ash

If a warning is issued for volcanic ashfall affecting the area, the following actions must be taken:

- **Protect ventilation systems:** Shut down air-conditioning and ventilation systems to prevent ash from entering indoor spaces and damaging equipment.
- **Protect drainage and water infrastructure:** Cover exposed collection points where practicable to reduce ash contamination.
- **Monitor roof loading:** If ash accumulates, remove it carefully using trained personnel and appropriate PPE. Do not use water where this may increase roof loading.

Extreme heat stress

Periods of extreme heat can lead to serious heat-related illness. Heat stroke is a life-threatening medical emergency and requires immediate medical attention.

The following precautions must be observed during periods of prolonged heat exposure:

- Employees should wear loose, lightweight, light-colored clothing (avoid dark colors and heavy fabrics where possible) and use a buddy system so that workers check on one another regularly for signs of heat stress. Potable water stations must be maintained and refilled as required.
- Where possible, avoid working in direct sunlight and wear suitable sun protection, especially during the hottest part of the day.
- Ensure that employees remain properly hydrated by drinking water regularly.
- If heat exhaustion is suspected, move the person to a shaded or cool area immediately.
- Lay the person down, elevate the feet slightly, and loosen or remove heavy clothing where appropriate.
- Cool the person using water, air movement, wet cloths, or ice packs applied to major cooling points where available.
- If the person becomes confused, faints, develops a high temperature, or shows signs of worsening condition, seek medical assistance immediately.

Earthquakes

If an earthquake occurs while you are inside a building, remain indoors and take immediate protective action.

- Find a safe place under a sturdy desk or table and protect your head and neck.
- Remain in position until the shaking has stopped.
- Do not run outside or go downstairs during the shaking, as falling debris may present a greater hazard.
- After the shaking stops, check for injuries, unstable objects, and other hazards before moving.
- When it is safe to do so, proceed to the designated muster point and await further instructions.

- If you are outside when the earthquake occurs, remain outside and move away from buildings, trees, and overhead lines.
- Move to an open area, crouch down, and protect your head until the shaking stops.
- Open spaces such as the basketball court may be used as temporary safe areas, if appropriate.
- After the shaking has stopped, proceed to the nearest muster point if it is safe to do so.
- No person may re-enter any prefabricated dormitory or office until the structure has been inspected and declared safe by a competent person.

Muster points

- The **Primary Assembly Point is** the **Basketball Court** area. It provides a wide, open clearing away from prefabricated roof lines and overhead utility drops.
- **Secondary Assembly Point is** open, a crushed-stone leveling area on the perimeter boundary if the basketball court is compromised.

Post emergency response

Following any emergency, a formal investigation shall be conducted to determine the immediate and underlying causes of any incident. The investigation process must be fully documented by the company to maintain accountability and support continuous improvement.

All findings arising from the investigation shall be reviewed by the Health, Safety, and Environment (HSE) team together with management. The Emergency Response Plan shall then be updated as necessary to reflect lessons learned and any required corrective actions.

Key findings from the investigation shall be communicated to employees to strengthen awareness and prevent recurrence. A summary may also be posted on the HSE notice board to promote transparency, learning, and a culture of continual improvement.

8.4.4. Noise Management Plan

The health impacts associated with noise vary according to the levels of noise exposure; and include noise-induced hearing impairment, interference with speech communication, sleep disturbances, and psychophysiological, mental health, and performance effects (World Health Organization, 1999).

Table 125 presents a list of equipment planned for use at the site during construction, and their estimated maximum noise emission levels at a distance of 50 ft (15 m) (US Department of Transportation, 2017; values taken from Southern California Edison, 2015). These inform the approach to noise management and related mitigation measures.

Table** 125**: Estimated Noise Emission Output from Construction Equipment

Equipment	Noise Levels at 50 ft (dBA)	
	US Department of Transportation, 2017	**Southern California Edison, 2015**
Truck Crane (25 tons)	85	81
Excavator (Model 365)	85	81

Road Roller (18 tons)	85	81
Concrete Pump Truck (43 m)	82	82
Concrete Mixing Truck (600 L)	85	80
Forklift (3.5 tons)	-	80
Generator (5.5 Kw)	81	82

Table 126 further identifies some noise-induced health impacts and the conditions under which they occur, setting the context for management measures, the potential sensitivities to be considered, the nuances in exposure and the experience of noise.

Table** 126**: Noise-Induced Health Impacts

Health Impacts	Conditions Causing Health Impacts
Hearing Impairment	Occurs as a result of sound in the frequency range of 2000-6000Hz (largest effect at 4000 Hz). Occurs at frequencies as low as 2000 Hz with prolonged exposure of 8 hours or more; Hearing impairment is not expected to occur at 75dB or lower, even for prolonged exposure; and during leisure time and environmental noise at 70dB or below for 24 hours; effects are seen at impulse noise exceeding 140dB
Speech Intelligibility	Impacted by noise with sound pressure levels of 35dB or higher. This is because normal speech is at 50dB and to achieve full sentence intelligibility in listeners with normal hearing, the signal to noise ratio (i.e., the difference between the speech level and the sound level of interfering noise) should not exceed 15dB.
Sleep Disturbance	Primary effects of sleep disturbance include difficulty falling asleep, awakenings and alterations of sleep stages and depth, increased blood pressure, heart rate; changes in respiration, cardiac arrhythmia and increased body movements. Continuous background sound level of 30dB and individual noise events exceeding 45dB should be avoided to achieve a good night's sleep.
Disruption of Physiological Function	Susceptible members of the population (such as workers exposed to noise and persons living near airports, industry and noisy streets) are at risk of developing permanent effects such as hypertension and ischemic heart disease as a result of exposure to high sound levels. While the magnitude and effects are affected by individual characteristics, lifestyle behaviors and environmental conditions, workers exposed to industrial noise for 5-30 years are at risk of developing hypertension; long term exposure to air and road traffic exceeding 65-70dB over 24 hours have been associated with cardiovascular effects such as ischemic heart disease and hypertension
Annoyance	The level of annoyance associated with exposure to noise varies in populations according to characteristics of noise (e.g. the source), and non-acoustical social, psychological and economic factors. Nevertheless, it has been determined that noise above 80dB, may increase aggressive behavior. However, it is noted that at 55 dB and 50dB, few people are highly and moderately annoyed during the day respectively. The nighttime level to reduce the likelihood of annoyance, should be 5-10dB lower than

Health Impacts	Conditions Causing Health Impacts
	during the day.

8.4.4.1. Noise Monitoring Plan

The Noise Monitoring Plan establishes a structured framework for tracking, evaluating, and managing noise emissions associated with project activities. It defines monitoring objectives and sets out procedures for systematic measurement of ambient and operational noise levels. The plan ensures compliance with regulatory thresholds, supports timely corrective actions, and provides transparent documentation for stakeholders. By integrating complaint response mechanisms and routine reporting, the plan strengthens accountability and safeguards community well-being throughout project implementation.

Table 127 sets out the noise management and monitoring measures to be applied through construction and operation.

Table** 127**: Noise Management and Monitoring Plan

Noise Management			
Objective (s): 1. To avoid, minimize and control the impacts of noise on receptors in the project area, throughout the project's lifecycle **2. To ensure construction activities are undertaken in accordance with best practice controls.**			
Management Strategy: Noise to be managed primarily through administrative and equipment controls during the construction and operation of the South Coast Sewage Treatment Plant upgrade and the South Coast Water Reclamation and Re-use Facility			
		Responsibility	Frequency/ Timeline
Controls	Restrict noise-producing activities during construction to daytime period (i.e. during working hours -08:00 h-18:00 h) so that noise levels at sensitive receptors do not exceed 55dBA	Site Supervisor (CRSEG)	Daily
	Provide hearing protection for workers, to ensure exposure to noise does not exceed the 85dBA threshold, over an 8-hour period.	HSE Officer (CRSEG)	Daily
	Implement administrative controls such as rotating workers in instances where activities producing noise in excess of 85dBA, extend over an 8-hour period	Site Supervisor (CRSEG)	Daily
	Conduct tool-box talks on noise reduction practices	HSE Officer (CRSEG)	Weekly
	Maintain all equipment in good working order in accordance with the Manufacturer's specifications.	Site Engineer (CRSEG)	Monthly

Noise Management			
Objective (s): 1. To avoid, minimize and control the impacts of noise on receptors in the project area, throughout the project's lifecycle **2. To ensure construction activities are undertaken in accordance with best practice controls.**			
Management Strategy: Noise to be managed primarily through administrative and equipment controls during the construction and operation of the South Coast Sewage Treatment Plant upgrade and the South Coast Water Reclamation and Re-use Facility			
		Responsibility	Frequency/ Timeline
	Install noise dampening mechanisms such as mufflers and silencers on generator and heavy machinery. Place generator in suitable, noise-dampening enclosure	Site Engineer (CRSEG)	Prior to use
	Implement a system of pre-start checks to ensure equipment performance as required.	Site Supervisor (CRSEG)	Daily
	Avoid unnecessary idling of vehicles and heavy-duty equipment. These should be turned off when not in use	Site Engineer and HSE Officer	Daily
	Maintain the greatest practicable separation between noise-generating plant and the nearest residential receptors at Harmony Hall, and install acoustic screening at fixed plant where the separation achievable on site is insufficient	Site Engineer (CRSEG)	During Construction
	Conduct noise monitoring to ensure noise levels are within acceptable limits	HSE Officer (CRSEG)	Monthly
	Inform relevant stakeholders about planned construction activities and sensitize them about the project's grievance redress mechanism (GRM) Implementation of GRM	Stakeholder Engagement/ Community Liaison Officer (CRSEG) Stakeholder Engagement/ Community Liaison Officer (CRSEG)	Prior to commencement of construction activities As needed
Performance Indicators	•Noise levels at the sensitive receptors do not exceed 55 dB(A) •Occupational noise exposure for workers remains below 85 dB(A) over an 8-hour time-weighted average. •100% of workers in high-noise areas provided with	HSE Officer (CRSEG)	Monthly

Noise Management			
Objective (s): 1. To avoid, minimize and control the impacts of noise on receptors in the project area, throughout the project's lifecycle **2. To ensure construction activities are undertaken in accordance with best practice controls.**			
Management Strategy: Noise to be managed primarily through administrative and equipment controls during the construction and operation of the South Coast Sewage Treatment Plant upgrade and the South Coast Water Reclamation and Re-use Facility			
		Responsibility	Frequency/ Timeline
	and using hearing protection. •100% completion of scheduled noise monitoring activities and monitoring report completed within one week of monitoring. •100% of machinery maintained on schedule and in accordance with manufacturer's specifications. •All noise-related grievances are acknowledged within two working days, or within 24 hours where the noise is continuing at the time of the complaint, and resolved within seven working days, in line with the Grievance Redress Mechanism (Section 8.4.12). •At least four noise-awareness toolbox talks conducted per month during construction. •Corrective actions implemented within 48 hours of any exceedance.		
Monitoring	•Daily inspection of the active work areas at the treatment plant compound and the reclamation facility site •Conduct of noise monitoring monthly at baseline monitoring locations, workers' accommodation area, generator and equipment use zones using calibrated sound level meter	HSE Officer (CRSEG)	Daily inspection & Monthly monitoring of noise levels
Reporting	Complaints will be channeled to the Project Manager and will be documented in the environmental and social performance reports	HSE Officer (CRSEG) Project Manager (CRSEG)	As needed
Corrective Actions	•Investigate source of noise exceedances and implement corrective measures prior to re-commencing work •Reschedule of noise-generating activities to reduce	Site Engineer (CRSEG)/HSE Officer (CRSEG)	Monthly

Noise Management			
Objective (s): 1. To avoid, minimize and control the impacts of noise on receptors in the project area, throughout the project's lifecycle **2. To ensure construction activities are undertaken in accordance with best practice controls.**			
Management Strategy: Noise to be managed primarily through administrative and equipment controls during the construction and operation of the South Coast Sewage Treatment Plant upgrade and the South Coast Water Reclamation and Re-use Facility			
		Responsibility	Frequency/ Timeline
	noise annoyance. •Re-train workers on noise control practices where necessary •Re-measure noise levels post-correction to verify compliance •Document corrective measures and update Environmental Management and Monitoring Plan		

8.4.5. Solid Waste and Hazardous Materials Management Plan

Introduction

This Solid Waste and Hazardous Materials Management Plan establishes the minimum requirements for the segregation, storage, collection, transport, and disposal of wastes generated from the Program. The plan is intended to protect human health, prevent nuisance conditions, avoid contamination of soil, groundwater, water (fresh, brackish and marine), and air, and ensure that wastes are managed in accordance with applicable Barbados requirements and approved disposal practices.

Scope

This plan applies to all Program operations, including the treatment plant compound under upgrade, the reclamation facility site under construction, accommodation areas, kitchens and dining areas, offices, workshops, laydown areas, housekeeping activities, maintenance tasks, and any temporary storage areas on the Project site. It applies to all personnel, including employees, contractors, subcontractors, visitors, and waste service providers involved in handling all waste generated by the Program.

Roles and Responsibilities

- **Project Manager:** Responsible for ensuring that adequate resources, personnel, and support are available for the effective implementation of this plan.
- **Operations Manager:** Responsible for coordinating with the HSE Representative to ensure that waste management procedures are implemented consistently across operations, including in the camp.

- **HSE Representative:** Responsible for maintaining waste management documentation, conducting inspections, providing guidance, and verifying that required resources and controls are in place.
- **Employees and Contractors:** Responsible for complying with the requirements of this plan, using designated waste containers correctly, reporting spills or waste-related issues, and maintaining good housekeeping practices.

Definitions

The following definitions are based on the Health Services (Collection and Disposal of Refuse) Regulations, 1975.

- **Refuse:** all solid waste derived from garbage, rubbish, swill, trade refuse and other waste matter;
- **Rubbish:** house sweepings, wood, leaves, trimmings from shrubs, sawdust, paper, cardboard, grass, rags, old shoes, tires and all other combustible material;
- **Swill:** particular garbage, which is wholly, or nearly so, edible as a food having food value for animals, or foul accumulation from animal, vegetable or other matter wasted, from clubs, hospitals, hotels, restaurants and public eating places;
- **Waste matter:** material composed of soil, earth, stones, wasted concrete blocks, glassware, ashes, metals and other non-combustible material which is, has been or is to be, discarded.

The definition of swill is reproduced from the Regulations. For this Project, waste from the camp clinic or first-aid point, including sharps, dressings, swabs and expired medicines, is health care waste and not swill: it is segregated at source in labelled, puncture-proof containers, stored with hazardous waste and removed by a licensed health care waste contractor to an approved treatment facility.

For this plan, waste generated shall be grouped into the following operational categories

- **General/Municipal solid waste (MSW)**: Combined residential and commercial waste material generated in any municipal area.
- **Recyclable waste:** Waste that can be collected, processed, and transformed into new materials, including paper, cardboard, plastic bottles (PET/HDPE), glass, scrap metal and oil.
- **Organic waste:** Biodegradable waste such as food scraps, vegetable matter, and other compostable material generated from kitchen and dining activities.
- **Bulky waste:** Furniture, old appliances, discarded automobiles and auto parts, rubber, or such matter as may accumulate as a result of building construction, renovations or repairs.
- **Construction and Demolition waste (C&D):** Waste generated from construction, maintenance, renovation, or repair activities, including packaging, timber offcuts, concrete fragments, and other non-hazardous construction debris.
- **Special-care or hazardous waste:** Waste requiring special handling due to its potential health, safety, or environmental risks, including grease, sewage sludge, offal, chemicals, used oil, batteries, fluorescent lamps, contaminated absorbents, and other regulated materials.

Procedure

Expected types of waste & segregation

The principal waste categories expected across the Project site include general waste, organic waste, construction and demolition waste, recyclable waste, bulky waste, and hazardous waste. Demolition

waste arises specifically from the plant upgrade, where existing process units are removed, and it carries the asbestos and hazardous material survey requirement recorded among the gate conditions. Waste shall be segregated at source to minimize cross-contamination, support reuse and recycling, and reduce the volume requiring final disposal. Segregation practices shall be aligned with applicable Barbados requirements and the approved arrangements for the project.

- **General waste** shall be placed in covered, leak-resistant bins fitted with liners.
- **Recyclable materials** shall be separated into clearly labeled containers for paper/cardboard, plastics, glass, and metals where collection or delivery options are available.
- **Organic waste** shall be kept in closed containers and removed frequently to control odors, flies, and vermin. Discarded meat shall be stored securely, including refrigeration or freezing where required, until the day of disposal. Suitable organic material may be retained for use as fertilizer in vegetable plots, provided it does not create odors, attract pests, or present a health risk.
- **Bulky waste** shall be stored in a designated area pending approved collection or disposal.
- **Hazardous waste** shall be stored separately from general waste in secure, labeled containers that are compatible with the waste type and protected from rain, spills, and unauthorized access. Different types of hazardous waste shall not be mixed unless specifically approved by a competent specialist. Safety Data Sheets shall be available for hazardous materials that become waste.
- **Secondary containment for hazardous waste** shall have sufficient capacity to contain at least 110% of the volume of the largest container stored within it. Hazardous waste storage areas shall be inspected daily, and any defects, leaks, or housekeeping issues shall be corrected promptly.

This plan prioritizes waste minimization and the four Rs: Reduce, Reuse, Recycle, and Recover energy before disposal. Waste reduction, reuse, and recycling shall be the primary focus because energy recovery is not currently being pursued. All bins and storage areas shall be clearly labeled, maintained in a sanitary condition, and located away from drainage paths, watercourses, and sensitive receptors. Open dumping and open burning of waste are prohibited.

The following color coding shall be used to identify waste streams:

- Recyclable waste – Blue for dry recyclables.
- General Waste – Black
- Food and organic waste - Green
- Paper/cardboard - Yellow
- Hazardous waste- Red

Waste collection, transportation & disposal

Waste shall be collected on a scheduled basis, at least weekly or more frequently where required, to prevent overflow, nuisance conditions, and health risks. Housekeeping personnel or assigned camp staff shall inspect waste receptacles daily and transfer waste to the central storage areas as needed. Central storage areas shall be kept clean, accessible to collection vehicles, and managed to prevent litter, runoff, and pest infestations. Four central storage areas shall be used to stage waste before off-site transport. Two areas located at the facility entrances will store recyclable materials, general waste, and organic waste that can be reused by the facility.

A designated hazardous waste storage area will be located on the north-western side of the facility, and a separate bulky waste storage area shall be located on the northern side. The image below illustrates the expected waste storage arrangement at the campsite. Any changes to the storage arrangement shall be reflected in an updated site layout image and communicated to relevant personnel.

Before waste is removed from the facility, the waste log shall be completed. A waste manifest shall also be completed before waste is transported from the facility to any disposal, treatment, or recycling facility.

The Waste Manifest Form is provided in Table 129 (Section 8.4.5). Each off-site load shall be recorded against the applicable log entry, transporter and licensed receiving location, with signed transfer and receipt records retained for verification.

General camp waste shall be transported only to approved municipal solid waste disposal facilities or collected by an authorized service provider. Recyclable materials shall be sent to approved recycling facilities where available. Commercial or industrial wastes that are not routinely accepted at local disposal sites shall not be transported for disposal until acceptance requirements and any necessary approvals have been confirmed. Hazardous waste shall be managed by suitably authorized contractors or in accordance with written guidance from the Environmental Protection Department (EPD).

Used oil, chemicals, batteries, lamps, electronic waste, and contaminated materials shall be stored in appropriate containers and secondary containment where required. These wastes shall be removed off-site through a controlled handover process. Spill kits shall be available in hazardous waste storage locations, and any spill shall be contained, cleaned up, and reported immediately in accordance with site emergency procedures.

Waste collection frequency will be increased during periods of peak occupancy, high food preparation activity, or special maintenance works. Waste segregation and storage areas are shown at Figure 64.

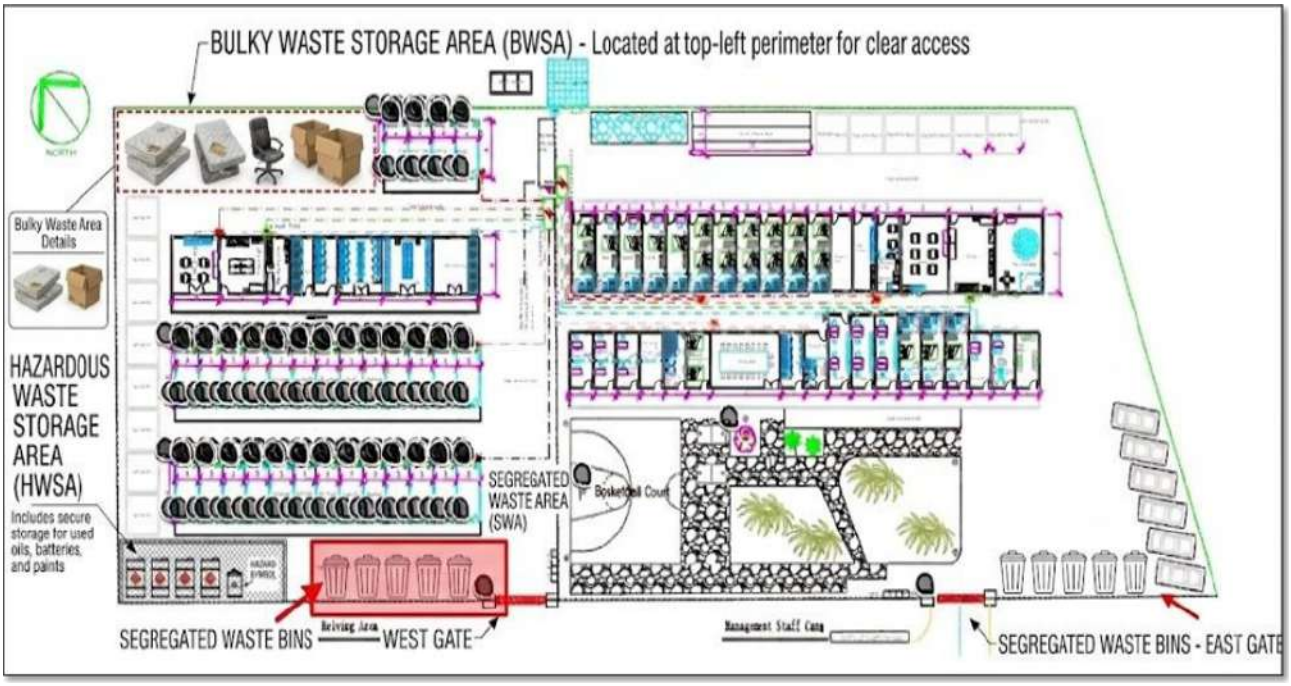


Figure *64*: Waste Segregation and Storage Areas within the Workers' Campsite

Documentation

Records shall be maintained to demonstrate proper waste handling and disposal. Documentation in digital form shall be retained by site management and made available for internal review or inspection as required. At a minimum, records shall include waste inspections, estimated quantities or container counts, dates of collection, transporter details, disposal or recycling destination, incident reports, and copies of manifests, receipts, or disposal certificates for special or hazardous wastes.

Waste log

A waste log shall be maintained on site to track the type of waste generated, the point of origin, the estimated quantity, the date the waste was removed from the site, the person or contractor responsible for handling the waste, and any relevant remarks. The log shall be completed at least weekly and updated whenever waste is removed from the facility.

Waste manifest

A waste manifest shall accompany all waste that leaves the facility. Manifest information shall include the waste description, quantity, container type, date of shipment, generator details, transporter details, receiving facility, and confirmation of receipt. Manifests shall be valid only when signed by the relevant authorized personnel, and copies shall be retained with the site waste records.

Waste arisings are recorded in the log at Table 128.

Table** 128**: Waste Log

Date	Source/Area	Waste category	Description	Quantity	Unit	Disposal Method	Handled By	Remarks

Instructions:

- This document should be used every time waste is collected for disposal, storage or recycling.
- The information in this document must match the information on the waste manifest form

Waste manifest form

Typical waste stream and segregation route across the Project site

Off-site transfers are recorded on the manifest at Table 129.

Table 129: Waste Manifest Form

Manifest Information			
Manifest No.		**Date**	
Project area / site		**Location**	
Waste Generator		**Contact Person**	
Telephone / Email		**Reporting Period**	
Transporter / Collector		**Vehicle No.**	
Receiving Facility / Disposal Site		**Site Contact**	
Waste Stream		**Classification**	Hazardous / Non-hazardous
Description of Waste			
Quantity		**Unit**	kg / L / bags / drums / bins
Container Type		**No. of Containers**	
Storage Area at Camp		**Date Removed**	
Special Handling Instructions			
Generator Representative Name		**Signature / Date**	
Transporter Representative Name		**Signature / Date**	
Receiving Facility Representative Name		**Signature / Date**	

8.4.6. Traffic and Pedestrian Management Plan

Introduction

The Traffic and Pedestrian Management Plan provides a structured approach to ensuring safe, efficient, and coordinated movement of vehicles, workers, and community members during project activities. It

identifies potential risks such as congestion, restricted access, and pedestrian safety hazards, and outlines measures to minimize disruption, protect vulnerable groups, and maintain emergency access routes. By integrating monitoring, reporting, and stakeholder communication, the plan reinforces compliance with regulatory requirements and safeguards community health, safety, and security throughout construction and operation.

The primary objective of this Traffic Management Plan (TMP) is to ensure the safe, orderly, and efficient movement of heavy trucks, delivery vehicles, and construction equipment to and from the facility, especially considering the narrow community road that must be used to access the site.

The plan regulates all vehicular and pedestrian traffic, including transit through the adjacent community road.

Temporary vehicle and work-area lighting shall be directed downwards and shielded from surrounding residences, public roads and sensitive habitat. Avoid glare, light spill into bedrooms, distraction to road users and unnecessary night-time illumination. The Site Manager shall check light placement and intensity during setup and after complaints; the Community Liaison Officer shall record and respond to complaints under the GRM. Lighting remains subject to any applicable traffic safety, turtle-sensitive lighting and environmental requirements.

Scope

This plan sets out the traffic and pedestrian management procedures for movement across the whole of the Project site, covering the treatment plant compound under upgrade, the reclamation facility site under construction, and the workers' campsite that serves both. It is a single integrated movement plan, which is the arrangement required by this assessment because the three areas are reached by one shared narrow residential access route and present one combined movement risk to the same receptors. It provides information on potential hazards and guidance for vehicles and pedestrians, and it operates with one set of transit windows, speed limits, wardened crossings and off-site staging arrangements across all three areas. The zone arrangements described below cover internal movement in each area and are applied together.

Authority

- **Project Manager:** has the overall accountability for Traffic management Plan compliance; approval of any deviations.
- **Operations Manager** has the responsibility for Day-to-day implementation and enforcement of the Traffic Management Plan; scheduling vehicle movements; incident reporting; and maintaining the vehicle register.
- **HSE Manager** has the responsibility to audit Traffic Management Plan compliance; community complaint management; monthly review meetings, and incident investigations
- **Traffic Wardens:** Control of vehicle entry and exit through community roads; emergency clearance; pedestrian protection; two-way radio communication.
- **Drivers/ Operators:** Compliance with all TMP rules; adherence to speed limits and scheduled windows; reporting of hazards or incidents.

Procedure

Vehicle management

- All vehicles associated with the project will select the shortest, most fuel-efficient routes that avoid sensitive environmental areas, heavily populated neighborhoods, and areas with strict load or height restrictions.
- The site will be designed to reduce unloading time, minimize double handling and reduce idle times for cranes and forklifts.
- Signs will be placed along the community roadway to inform the community of the type of vehicles that will be traveling in the community.
- Traffic wardens shall be stationed at both ends of the community road during peak movement windows (shift changes, deliveries, equipment movements).
- Two-way radio communication shall be maintained between the marshals at each end of the community road to coordinate vehicle passage.
- All trucks must maintain a speed of 15km/k when moving within the community.
- Trucks will, as reasonably possible, not block the passage of any vehicle traveling in the opposite direction.
- A maximum of two trucks at a time will travel in a convoy within the community roads. They must maintain 50 meters between them.
- If the contractor is required to move an abnormal load, the contractor will implement specialized protocols for managing abnormal loads, such as using appropriate specialized trailers (e.g., trough trailers) to prevent damage.
- All construction vehicles shall be fitted with tarpaulins overloads of fine materials (sand, gravel, soil) before entering the community road.
- Maximize truck load capacity to reduce the total number of trips and eliminate "empty miles".
- When necessary, wheels should be washed, and a wash facility should be installed at the site exit to prevent mud and dust from being tracked onto the community road.
- To reduce and eliminate vehicle idling, the contractor will enforce a strict "no idling" policy for vehicles and machinery waiting to unload to minimize local air pollution.
- To ensure fuel efficiency, only use modern, fuel-efficient trucks (e.g., those meeting strict emission standards) and consider using cleaner alternatives such as biofuels, hybrid or electric transport if possible.
- All transport vehicles associated with the project and onsite machinery must be well-maintained to prevent oil leaks and reduce emissions.
- Once available, vehicles associated with the project will be equipped with Emission Control Technologies (e.g., Selective Catalytic Reduction - SCR).
- Once at the entrance of the new facility, vehicles will traverse the site along the southeastern boundary of the property until they reach the designated area for the workers' camp.
- The site access roads will be all-weather to prevent excessive mud from tracking onto public roads, which can impact local air quality and water systems.
- The contractor will spray water on site access roads during dry conditions to prevent dust dispersion.
- All vehicles associated with the project will be allowed access. Any vehicle not associated with the project will not be allowed to traverse the camp but will be designated to a designated parking area.
- To properly manage all vehicles on site, all trucks and equipment arriving must be prescheduled within the time outlined in the table below:

Permitted movements by time window are given in Table 130.

Table** 130**: Traffic Movement Preschedule

Window	Time	Permitted Activities
Morning Delivery	06:00 – 07:00	Materials and supply deliveries only
Mid-Morning Equipment	09:30 – 11:30	Construction equipment movements
Afternoon Delivery	13:00 – 15:00	Materials and supply deliveries only
Evening Equipment Return	16:30 – 18:00	Construction equipment demobilization
Restricted Period	07:00 – 09:30 & 11:30 – 13:00	No heavy vehicles on the community road
Night (No Movement)	18:00 – 06:00	No vehicle movements unless an emergency

Pedestrian management

- The road to the project site runs through a community; all vehicles associated with this project must be cognizant of this.
- Heavy vehicles and construction equipment shall not travel the community road between 07:00 –08:00 and 14:30–16:30 to coincide with school travel hours.
- The company will assist in painting pedestrian crossings within the community, if possible. Additionally, safety information signs will be placed throughout the area to warn residents of ongoing activities.
- A maximum speed limit of 15 km/h will be enforced on community roads for all project vehicles without exception.
- All project drivers will be informed of the details outlined in the Traffic Management Plan.
- Clearly marked pedestrian walkways must be established within the camp boundary, providing safe routes from the dormitory areas to the canteen, washrooms, and office areas.
- Vehicles will follow a one-way loop on the site, where feasible, to reduce the potential for reversing conflicts in pedestrian zones.
- The female dormitory area (Dormitory-1, located in the Management Personnel Camp) will be designated as a vehicle-restricted zone, allowing access only to authorized vehicles.
- Spotters will be assigned to assist drivers when reversing in areas with pedestrian activity.

Parking on site

- All project vehicles must be parked in the project compound and follow the zones outlined in the table below

Designated parking zones and the vehicle types permitted in each are given in Table 131.

Table** 131**: Parking Locations on-site

Zone	Location	Vehicle Types
Zone A – Heavy Vehicle	Near site entrance/equipment charging	Heavy trucks, construction

Zone	Location	Vehicle Types
Laydown	area	equipment, low-loaders
Zone B – Staff Vehicles	Management camp vicinity	Light vehicles, management staff cars
Zone C – Worker Transport	Workers' camp – designated drop-off zone	Buses, minivans, worker transport
Zone D – Visitor Parking	Site gate/reception-area	Visitor and employer representative vehicles
Zone E – Equipment Storage	Equipment Storage & Server Room area	Maintenance vehicles, charging equipment

Pedestrian and community protection

Vehicle movements create risk for community members on foot, and that risk is not evenly distributed. Children traveling to and from school, women walking at the beginning and end of the day, older persons and persons with disabilities are the road users least able to avoid a heavy vehicle on a narrow road. The controls below are directed at them specifically and respond to the review comments on community safety and gender integration.

Table 132 presents the pedestrian and community protection measures.

Table** 132**: Pedestrian and community protection measures

Measure	Detail
School-hour restriction	Heavy vehicles and construction equipment do not transit the community road between 07:00 and 08:00 or between 14:30 and 16:30. The afternoon window begins at 14:30 because primary and secondary schools in Christ Church close between 14:30 and 15:00. The times must be verified against the actual opening and closing hours of St Lawrence Primary School and St Luke's Academy before the schedule is fixed.
Driver briefing	All drivers, including those employed by subcontractors and by delivery and logistics providers, are briefed before first entry on the community context, the movement windows, the speed limits and the standard of conduct expected toward residents. The briefing is repeated on any change. Including zero-tolerance for harassment, cat-calling or any form of sexualized behavior toward community members, heightened vulnerability of women, girls, older persons and PWDs. Sign and training on the Code of Conduct
Warden instruction	Traffic wardens are briefed to protect pedestrians with particular attention to school children, women, older persons and persons with disabilities, and to clear the community road immediately on the approach of an emergency vehicle.
Signage	Pedestrian crossings within the community will be painted where practicable and warning signage placed along the route. Signage is pictorial as well as textual, so that it is intelligible to non-literate readers and to workers who do not read English. Temporary road signs are erected and maintained to notify road users of works, lane closures and diversions. GRM contact information included on

Measure	Detail
	signage.
Flaggers	Flaggers are trained and equipped with personal protective equipment, high-visibility clothing and two-way communication devices, and are stationed at critical bends, access points and the main gate whenever required. Respectful engagement with all road users, non-discrimination and zero-tolerance for SH/SEA/GBV.
Maintained access	Access to residences, businesses and emergency vehicles is maintained at all times, except for short closures notified in advance. In consultation with affected residents and businesses with attention to households with vulnerable persons.
Community information sessions	Sessions on traffic safety are held before construction begins and repeated at intervals, targeted at women, children, older persons and persons with disabilities as well as the general community, and delivered through the Stakeholder Engagement Plan. Separate sessions will be held with women and vulnerable groups where feasible.
Conduct reporting	Unsafe driving and inappropriate driver behavior toward community members are reportable through the Grievance Redress Mechanism and are treated as conduct matters under the Code of Conduct, not only as traffic matters.
Gender-sensitive complaint handling	Complaints and incidents relating to driver behavior, including any allegation of sexual harassment, exploitation or gender-based violence involving community members or workers, and any concern raised by women, are logged with the receptor group recorded, investigated by the Social and Gender focal point with the HSE Officer, and reported monthly, where appropriate referred to social support services as defined in the GRM and SH/SEA/GBV Prevention and Response Plan.
Approval	The Traffic Control Plan prepared by the Contractor is submitted to the Project Execution Unit and the Barbados Water Authority for approval, and complies with national road safety standards and temporary traffic control guidance.

Additionally,

- No vehicle shall park in a manner that obstructs internal camp pedestrian walkways, canteen access, or emergency assembly areas.
- Heavy vehicles awaiting unloading shall be directed to Zone A and must not queue on the community road.
- Overnight parking of heavy vehicles or construction equipment on the community road is strictly prohibited.
- Vehicles not listed on the project vehicle register shall not be admitted to the site without prior authorization from the Site Manager.
- The Equipment Charging Area (as indicated on the camp layout plan) shall be designated for non-motor vehicles and construction tool charging. This area shall not be used for general parking.

Emergency vehicle access

The following measures shall ensure emergency services can reach the site without delay:

- The community road shall never be blocked by parked project vehicles, construction equipment, or stored materials at any time.
- All traffic wardens shall be briefed to immediately clear the community road upon the approach of an emergency vehicle (fire, ambulance, police)
- Emergency access lanes within the camp shall be kept clear at all times, with a minimum width of 4.0 m to accommodate fire appliances.

Reporting of incidents & plan review

- When an incident occurs, it must be reported immediately to the Project Manager or HSE Manager.
- All incidents must be reported as per the Incident reporting procedure.
- The plan must be reviewed annually or when there is an incident.
- All revisions to the TMP shall be reissued and re-briefed to all relevant personnel.
- A copy of the current TMP revision shall be maintained at the site gate and with the HSE Manager at all times.

In addition to the vehicle management procedure above, the following transport and emission controls apply:

Transport and Logistics Optimization:

- Fuel Efficiency: Use modern, fuel-efficient trucks (e.g., those meeting strict emission standards) and consider using cleaner alternatives as biofuels, hybrid or electric transport if possible.

Operational Emission Control:

- Idling Reduction: Enforce a strict "no idling" policy for vehicles and machinery waiting to unload to minimize local air pollution.
- Maintenance: Ensure all transport vehicles and onsite machinery are well-maintained to prevent oil leaks and reduce emissions.
- Emission Control Technologies: Use vehicles equipped with modern exhaust gas treatment technologies (e.g., Selective Catalytic Reduction - SCR).

Site Preparation and Management:

- Traffic Management: Plan site access roads for all-weather conditions to prevent excessive mud from tracking onto public roads, which can impact local air quality and water systems.
- Dust Control: Implement water spraying on site access roads, especially during dry conditions, to prevent dust dispersion.

The traffic movement site layout is shown in Figure 65.

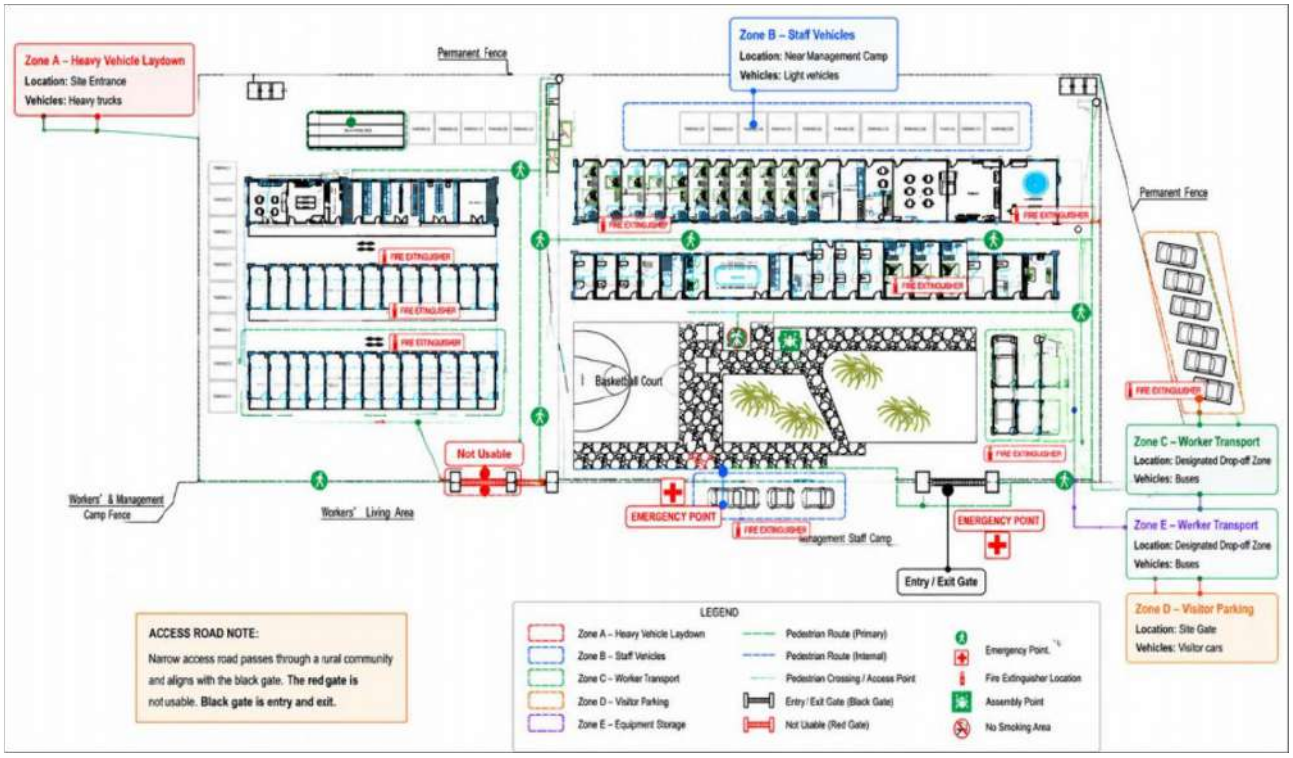


Figure *65*: Traffic Movement Site Layout

The Traffic and Pedestrian Management Plan ensures that project activities are carried out with minimal disruption to communities, safe access for pedestrians, and reliable emergency routes. By combining proactive risk mitigation, continuous monitoring, and transparent communication, the plan strengthens community trust, safeguards vulnerable groups, and upholds regulatory compliance. Its implementation contributes to safer construction practices, improved mobility, and enhanced protection of both workers and the public.

8.4.7. Labor Management Plan

8.4.7.1. Introduction

The Labor Management Plan (LMP) is a cornerstone of CRSEG's commitment to responsible project delivery for the SCWRP and the SCSTP. It is designed not only as a compliance instrument but as a practical, contractor-facing guide that ensures labor practices are fair, safe, and consistent with both national legislation and international standards. By embedding the principles of equity, non-discrimination, and respect for human dignity with particular attention to gender equality and the inclusion of migrant workers, younger and older workers and PWDs, the LMP provides a framework through which CRSEG can manage its workforce in a manner that protects workers, communities, and the integrity of the project.

The plan is firmly anchored in Barbados' legal framework, including the Employment Rights Act (2012), which guarantees fair treatment and contractual protections for employees, including protections against unjust dismissal and discriminatory treatment on the basis of sex, age, race, disability, nationality or other characteristics; the Safety and Health at Work Act (Cap. 356), which establishes the right of workers to refuse unsafe work without reprisal; and the Health Services Act (Cap. 44), which governs public health protections. These laws provide the baseline obligations for CRSEG and its

subcontractors, ensuring that labor practices meet the expectations of the Barbados Water Authority (BWA) and the Government of Barbados.

Equally important, the LMP demonstrates compliance with the Inter-American Development Bank (IDB)'s Environmental and Social Performance Standards (ESPS). ESPS 2 on Labor and Working Conditions requires fair treatment, safe working environments, and accessible grievance mechanisms. ESPS 4 on Community Health, Safety and Security emphasizes the need to protect surrounding communities from risks associated with construction and worker influx. ESPS 9 on Gender Equality mandates proactive measures to prevent discrimination and gender-based violence, promote equal opportunities for women and men in recruitment, training, advancement and pay, and address gender-differentiated risks in the workplace and worker-community interface, while ESPS 10 on Stakeholder Engagement requires inclusive, transparent, and culturally appropriate engagement with affected parties. Together, these standards require that the LMP make social and gender impacts visible, monitor them with disaggregated data and adapt controls where women, men or vulnerable groups are affected differently, and elevate the LMP beyond national compliance, aligning it with international best practice.

The LMP is closely tied to CRSEG's Workers' Code of Conduct, which sets mandatory behavioral standards for all employees, subcontractors, and representatives. The Code of Conduct prohibits child labor, forced labor, discrimination, harassment, and sexual exploitation or abuse. Discrimination and harassment include behavior based on sex, age, gender, disability, nationality, race, ethnicity, religion, sexual orientation or other characteristics. It also establishes expectations for courtesy, respect, and professionalism in worker interactions with colleagues and community members. By integrating the Code of Conduct into the LMP, CRSEG ensures that behavioral standards are enforced alongside labor protections, creating a holistic system of accountability and communicated in languages workers understand and supported by the GRM for all worker groups.

The LMP is not a standalone document. It functions as an integrating plan that is triggered by related ES plans and, in turn, supports them through workforce controls, training, grievance management, monitoring, and corrective actions including social and gender-responsive measures across OHSE, community health and safety, labor influx and SH/SEA/GBV risk management Figure 66(see Figure 66). The LMP does not contain those plans: the Code of Conduct (8.4.8), the SH/SEA/GBV Prevention and Response Plan (8.4.9), the Community Health Plan (8.4.10), the Stakeholder Engagement Plan (8.4.11), the Grievance Redress Mechanism (8.4.12), the HSE Management Plan (8.4.13) and the Emergency Preparedness and Spill Response Plan (8.4.3) are separate plans of this ESMP, listed in Table 117, and the LMP links to each of them. Figure 66 is illustrative; where its labels differ from those titles, the titles in Table 117 apply.

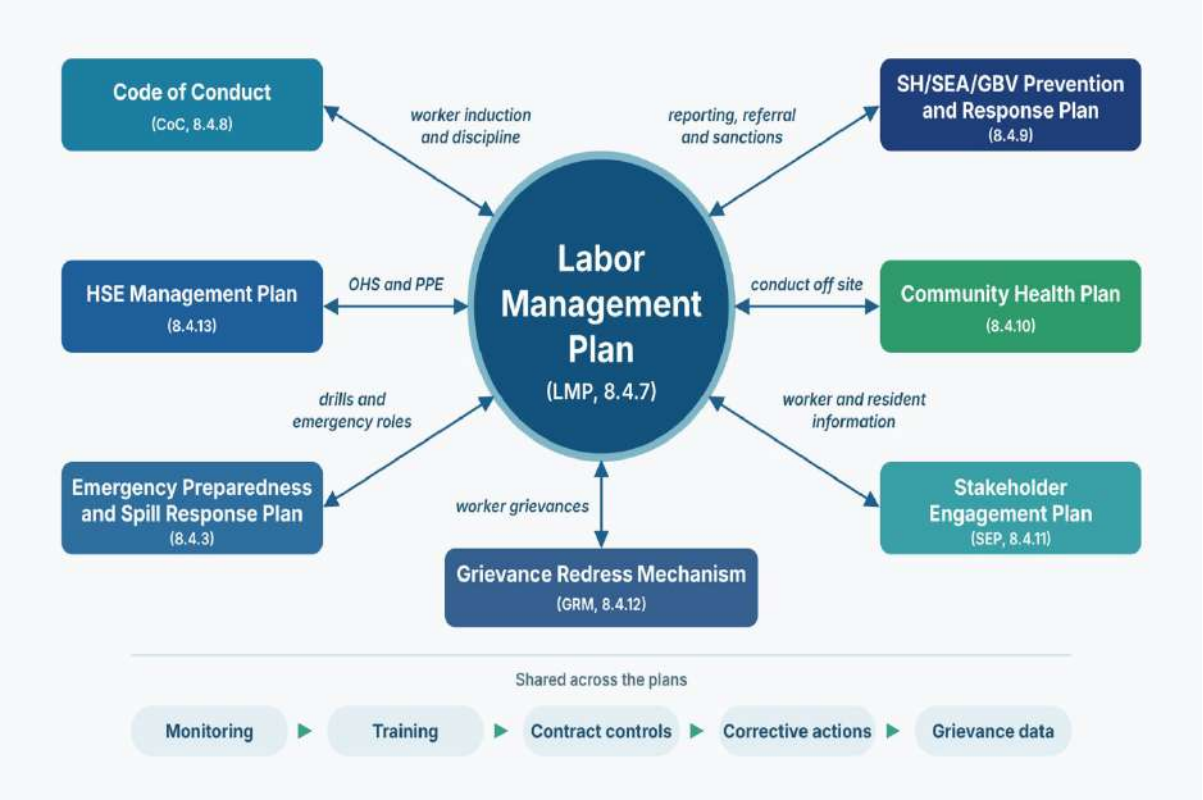


Figure 66: LMP integration with related environmental and social plans. This image is AI generated and is meant to be illustrative and to facilitate communication and understanding of the interdependencies among plans, particularly for workers and supervisors

This plan also recognizes the unique challenges posed by the anticipated influx of workers during peak construction. With hundreds of local and foreign workers expected, the project must address risks such as strain on housing and services, exposure to communicable diseases, and potential social tensions which may affect women and girls, older persons, PWDs, informal vendors and low-income households differently. The LMP therefore emphasizes careful workforce planning, equitable recruitment, and proactive engagement with local communities to mitigate these risks. It commits to collecting disaggregated data on age, sex, disability, and nationality to monitor inclusion and impacts, ensuring that vulnerable groups are not excluded or disproportionately affected. The project will engage with workers through mandatory Code of Conduct adherence, multilingual training (including OHS and SEA/SH prevention), accessible grievance mechanisms with non-retaliation protections, and regular communication on safety and welfare. For stakeholders and communities, engagement will primarily be managed by a Community Liaison Officer who will facilitate dialogue, conduct regular meetings, raise awareness on public health and SEA/SH prevention, and ensure access to the project's grievance redress mechanism for community concerns. Monitoring and feedback from both groups will be integral to adapting and improving labor management practices.

Worker welfare is a central theme of the LMP. The plan sets standards for safe, clean, and dignified accommodation, gender-segregated sanitary facilities, privacy and security measures for women's facilities, rest areas and dormitories, and reasonable accommodations for persons with disabilities. It requires access to medical care, recreational spaces, and communication facilities, with regular inspections to ensure compliance. These measures are designed to create a living environment that promotes dignity, safety, and productivity, consistent with both Barbados law and IDB ESPS 2.

Occupational health, safety and environment are treated as a cornerstone of the plan. The LMP mandates the implementation of the Workers' Health and Safety Plan, supported by daily toolbox talks, scheduled safety drills, and specialized training for high-risk tasks. Personal protective equipment is compulsory, and emergency preparedness is reinforced through the integration of the Emergency Response Plan and Incident Management Plan. Workers are explicitly granted the right to refuse unsafe work without fear of reprisal. Routine audits, accident reporting, and corrective action tracking ensure that safety standards are consistently upheld.

Finally, the LMP establishes mechanisms for worker grievance redress and sexual exploitation and abuse (SEA)/ sexual harassment (SH)/gender-based violence prevention covering SEA/SH/GBV risks affecting both workers and community members with particular attention to women and girls and other vulnerable groups. Workers are provided with accessible and confidential channels to raise concerns, with clear timelines for acknowledgment, resolution, and escalation. Special procedures are in place for SEA/SH/GBV-related grievances, ensuring survivor-centered handling with confidentiality, non-retaliation, and referral to appropriate support services. Workers often face significant barriers to reporting grievances, particularly for Sexual Exploitation and Abuse (SEA), Sexual Harassment (SH), and Gender-Based Violence (GBV), including language differences, fear of retaliation, lack of accessible channels, and heightened vulnerability for groups like women and persons with disabilities. To overcome these, the project implements confidential, survivor-centered reporting pathways that allow for anonymous or restricted disclosure of sensitive information for SEA/SH/GBV cases. Grievance data is collected and disaggregated by sex, age, nationality, disability, and vulnerability status, while individual case details for SEA/SH/GBV remain non-identifying to protect privacy. This meticulous collection and continuous analysis are crucial for the Environmental and Social Management Plan (ESMP) as they enable the identification of differential impacts and under-reporting, inform targeted prevention and survivor-centered response measures, ensure accountability through corrective actions, and drive continuous improvement, ultimately managing the confirmed high residual SEA/SH/GBV risks and ensuring compliance with social standards. As such, mandatory training, community awareness sessions, and zero-tolerance enforcement ensure that sexual harassment, exploitation, and abuse are prevented and addressed.

These grievance procedures are fully integrated into the project's grievance redress mechanism (GRM). The GRM provides workers, subcontractors, and community members with clear entry points (hotline, email, in-person, and anonymous channels) ensuring accessibility to women and men, youth, older persons, PWDs, and other vulnerable groups, defined timelines for acknowledgment and resolution, and escalation pathways when issues remain unresolved. SEA/SH-related grievances are channeled through a specialized confidential pathway within the GRM, ensuring survivor-centered handling, restricted information access, and referral to medical, psychological, and legal support services.

Figure 67 below illustrates the grievance flow: workers raise concerns through accessible channels → grievances are logged and acknowledged within two working days (urgent or important cases are acknowledged within 24 hours and aimed to be resolved in 2 days) → simple cases are resolved at site level within seven days → unresolved or sensitive cases escalate to the Grievance Redress Committee → SEA/SH cases follow the confidential survivor-centered pathway → if still unresolved, grievances may be referred to external oversight bodies such as the IDB's Independent Consultation and Investigation Mechanism (ICIM).

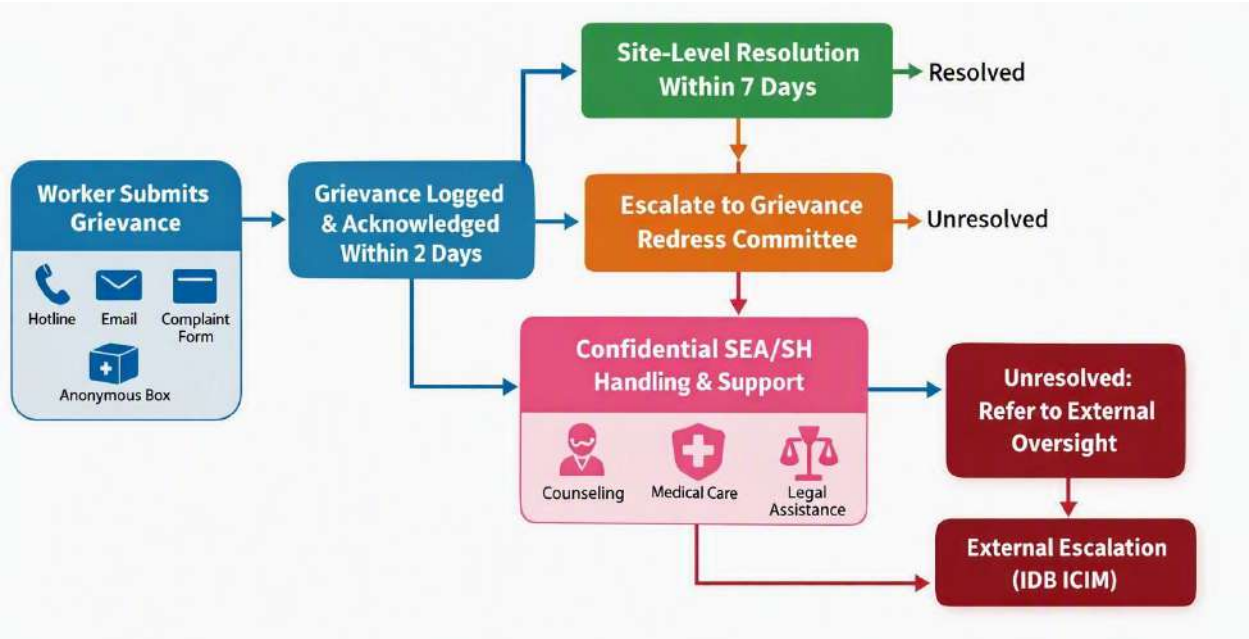


Figure 67**: Worker grievance flow for standard grievances**

8.4.7.2. Workforce Profile

The workforce for the SCWRRF and the SCSTP will be composed of a diverse mix of Chinese nationals employed directly by CRSEG, Barbadian nationals engaged through direct hire, and local subcontractors providing specialized services with a predominantly male workforce and a smaller proportion of women workers. This composition reflects both the international nature of the contractor and the project's commitment to engaging local labor markets. The presence of foreign and local workers side by side requires careful planning to ensure cohesion, respect, and equitable treatment across cultural and national lines and to prevent discrimination, harassment or exclusion based on sex, age, nationality, disability or other characteristics.

Chinese nationals will primarily occupy a mix of technical and supervisory roles, bringing specialized expertise in engineering, construction management, and water treatment technologies and unskilled labor roles. Their participation is critical to the transfer of technical knowledge and the successful delivery of complex infrastructure works (see more on this in the last section of the LMP). Barbadian nationals, meanwhile, will be engaged across skilled trades, unskilled labor, and camp support functions. Their involvement ensures that the project contributes directly to local employment, builds capacity within Barbados, and strengthens community ownership of the project outcomes with special effort to provide fair and equal opportunities for women and other workers to access skilled roles and training.

Local subcontractors will play a vital role in delivering specific services such as transport, catering, waste management, and construction support. Their inclusion not only diversifies the workforce but also stimulates the local economy by creating business opportunities for Barbadian enterprises including women-owned and small businesses and services that often employ women workers e.g. catering and cleaning. The LMP requires that subcontractors adhere to the same standards of labor management, occupational health, safety and environment, and behavioral expectations set out in the Workers' Code of Conduct, including non-discrimination, gender equality measures, SH/SEA/GBV prevention, access to the GRM for all workers, subcontractors, security personnel etc. This ensures consistency across the

workforce and prevents gaps in compliance with monitoring and audits checking conditions and protections for all workers including women and other vulnerable groups.

Figure 68 shows the integrated workforce model.



Figure 68**: Integrated workforce model. This image is AI generated and is meant to be illustrative and to facilitate communication and understanding of workforce composition, complementarities, and distinct roles**

The demographic composition of the workforce is expected to be diverse, including women, youth, persons with disabilities, and migrant workers. Vulnerable groups are defined as populations who may be disproportionately affected by project impacts or excluded from project benefits, including women, elderly persons, low-income households, and socially marginalized groups such as PWDs, migrants, informal workers, and female-headed households. The LMP commits to ensuring that all workers are equitably included in recruitment, training, and welfare provisions, with their rights safeguarded throughout the project lifecycle. Employment opportunities will be open to all qualified individuals, without restrictions based on pregnancy, age, or disability. Role assignments will be guided by an assessment of each worker's ability to safely and effectively perform the required tasks, consistent with Barbados labor law and the Disabilities Bill. This approach promotes equal opportunity while ensuring that work responsibilities are matched appropriately to protect health and safety.

Inclusivity and non-discrimination are central principles of the workforce profile. Recruitment will be conducted transparently and merit-based, with equal opportunity provisions ensuring that no worker is discriminated against based on gender, ethnicity, disability, sexual orientation, or other protected characteristics, and that women, youth, PWDs are actively encouraged and supported to apply for skilled and supervisory roles. Recruitment processes will ensure that no worker is excluded based on pregnancy, age, or disability and that all workers have fair access to training, overtime, promotion and other employment benefits. Assignment to specific roles will be determined by fitness to safely perform the required tasks, consistent with Barbados labor law and the new Disabilities Bill. Reasonable accommodation will be provided where necessary, ensuring equal opportunity while protecting workers from being burdened with tasks that could pose undue risk. CRSEG will provide reasonable accommodations for workers with disabilities, ensure gender-segregated sanitary facilities, and

promote equal access to training and advancement opportunities for Chinese and Barbadian workers, subcontractors and security personnel. These measures align with Barbados' Employment Rights Act and IDB ESPS 2, which require fair treatment and equal opportunity for all workers.

The integration of Chinese and Barbadian workers within the same camp and worksites requires proactive measures to foster mutual respect, address power imbalances between supervisors and junior staff and ensure gender-sensitive and cultural-sensitive conduct. Induction training will include modules on intercultural communication, respect for diversity, gender equality, prevention of discrimination and harassment, including SH/SEA/GBV and community interaction protocols. Supervisors will be trained to monitor interpersonal dynamics and intervene promptly in cases of discrimination, harassment, or conflict with particular attention to protecting women workers, younger workers, migrant workers and PWDs from bullying, exclusion or abuse of authority. Daily toolbox talks and regular refresher sessions will reinforce these principles, ensuring that inclusivity is not only a policy but a lived practice and that women and other under-represented workers are encouraged and feel safe to raise concerns.

Finally, workforce planning will include disaggregated data collection on age, sex, disability, nationality, and vulnerability status. This data will be used to monitor inclusion, identify potential disparities, and inform adaptive management measures including recruitment, task assignment, training access, overtime, promotion, disciplinary action, OHS incidents and grievance patterns. By tracking workforce composition and experiences, CRSEG can ensure that the project delivers equitable benefits, prevents exclusion, and responds effectively to emerging risks with periodic consultations of workers including women and vulnerable groups to validate findings and improve measures/responses. This approach demonstrates compliance with IDB ESPS 9 on Gender Equality and ESPS 10 on Stakeholder Engagement, while also meeting the expectations of the Barbados Water Authority for inclusive and socially responsible project delivery.

The workforce planning process is grounded in the projected labor influx baseline of 252 workers, comprising 120 Chinese nationals resident in the camp and 132 Barbadian/local personnel, with peak deployment of 203 workers in Q3 2028. The workforce is predominantly male (231 men and 21 women, or 8.3%), which underscores the need for gender-sensitive welfare, accommodation, and grievance access and specific measures to prevent SH/SEA/GBV, support and address the well-being of women and men working in a high-risk, male dominated environment.

Disaggregated data will therefore be collected and monitored across age, sex, disability, nationality, and vulnerability status, enabling CRSEG to track inclusion and identify disparities in recruitment, training, welfare, and grievance outcomes and to compare conditions and outcomes between different worker groups. This dataset will also distinguish between camp-resident workers (those housed in project-managed accommodation subject to 24-hour labor standards) and commuting workers who return home daily. The distinction is critical for monitoring welfare, supervision, and community interface risks, as camp-based workers experience continuous oversight and welfare obligations, while commuting workers interact more frequently with surrounding communities and may present SH/SEA/GBV risk profiles, particularly where the workforce is predominantly male and non-local.

Integrating this disaggregated data into workforce planning ensures that labor standards are applied consistently across both residential and non-residential worker groups, in line with Barbados labor law and IDB ESPS 2, 9, and 10. This approach strengthens adaptive management and supports equitable,

socially responsible project delivery, allowing CRSEG to identify and address any emerging gender or vulnerability-related gaps.

8.4.7.3. Workforce Baseline for Labor Influx Screening

The labor influx screening baseline is based on a planned total workforce of 252 persons, comprising 120 Chinese nationals resident in the camp and 132 personnel reported as Barbadian/local. Peak deployment is expected to reach 203 persons in Q3 2028, within the broader peak construction period from Q3 2027 to Q4 2028. The workforce is predominantly male, with 231 men and 21 women, meaning women represent approximately 8.3 percent of the planned workforce. Chinese personnel comprise 102 site workers, all recorded as male, and 18 management personnel, of whom one is a woman; local personnel comprise 132 persons, being 131 subcontractor personnel (111 men and 20 women) and the locally recruited HSE Officer. These figures provide the operating baseline for recruitment planning, accommodation, OHS, SEA/SH prevention, GRM readiness, worker-community interaction controls, and monitoring. Monitoring data is systematically disaggregated by sex, age group, nationality, job category, disability status, and vulnerability status to detect disparities and ensure equitable treatment across the project's workforce. This granular approach allows for the identification of potential under-representation, pay gaps, or higher grievance rates among specific groups, such as women, younger workers, older workers, persons with disabilities, and migrant workers. By analyzing this data, the project can address any differential impacts or barriers, recognizing that risks and needs, particularly for occupational health and safety (OHS), may vary (e.g., appropriate PPE sizing, task allocation, reproductive health considerations). The disaggregated information is crucial for informing adaptive management measures in areas such as recruitment, task assignment, training access, promotion, disciplinary actions, OHS incidents, and grievance patterns. Furthermore, for high-priority risks like Sexual Exploitation and Abuse/Sexual Harassment (SEA/SH) and Gender-Based Violence (GBV), monitoring includes sex and age-disaggregated data on non-identifying case information and complaints, along with indicators of under-reporting, to ensure survivor-centered responses and identify patterns. This comprehensive data collection also enables comparisons of conditions and outcomes between different worker groups, like camp-resident versus commuting personnel, thereby ensuring consistent application of labor standards and effective management of community interface risks. Ultimately, this detailed monitoring framework underpins compliance with labor standards and fosters accountability and continuous improvement throughout the project lifecycle.

The workforce baseline is summarized in Table 133 and illustrated in Figure 69.

Table** 133**: Workforce baseline for labor influx screening

Screening Factor	Baseline Finding	LMP Relevance
Total planned workforce	252 persons (120 personnel resident in the campsite)	Requires project-wide conduct management, supervision, GRM access, and welfare planning.
Nationality composition	120 Chinese nationals and 132 Barbadian/local personnel	Requires intercultural coordination, language access, fostering mutual respect and cohesion, monitoring, addressing power imbalances and careful worker-community interface management.

Screening Factor	Baseline Finding	LMP Relevance
Peak deployment	203 persons in Q3 2028	Enhanced supervision is required during peak labor presence.
Gender composition	231 male workers and 21 female workers; women represent 8.3 percent	Requires gender-sensitive welfare, sanitation, safe accommodation, privacy, reporting, SEA/SH/GBV prevention, equal opportunities and non-retaliation controls, confidential reporting and survivor-centered pathways.
Chinese skilled workers	102 site workers, all recorded as male, and 18 management personnel including one woman	Requires language-appropriate induction, Code of Conduct training and gender awareness and gender risk management (SH/SEA/GBV risks) training, supervision, and worker-community interaction rules.
Local subcontractor personnel	131 persons, including 111 men and 20 women, plus the locally recruited HSE Officer (132 local personnel in total)	Requires subcontractor cascade of LMP, CoC, GRM, OHS, welfare, and SEA/SH/GBV obligations.

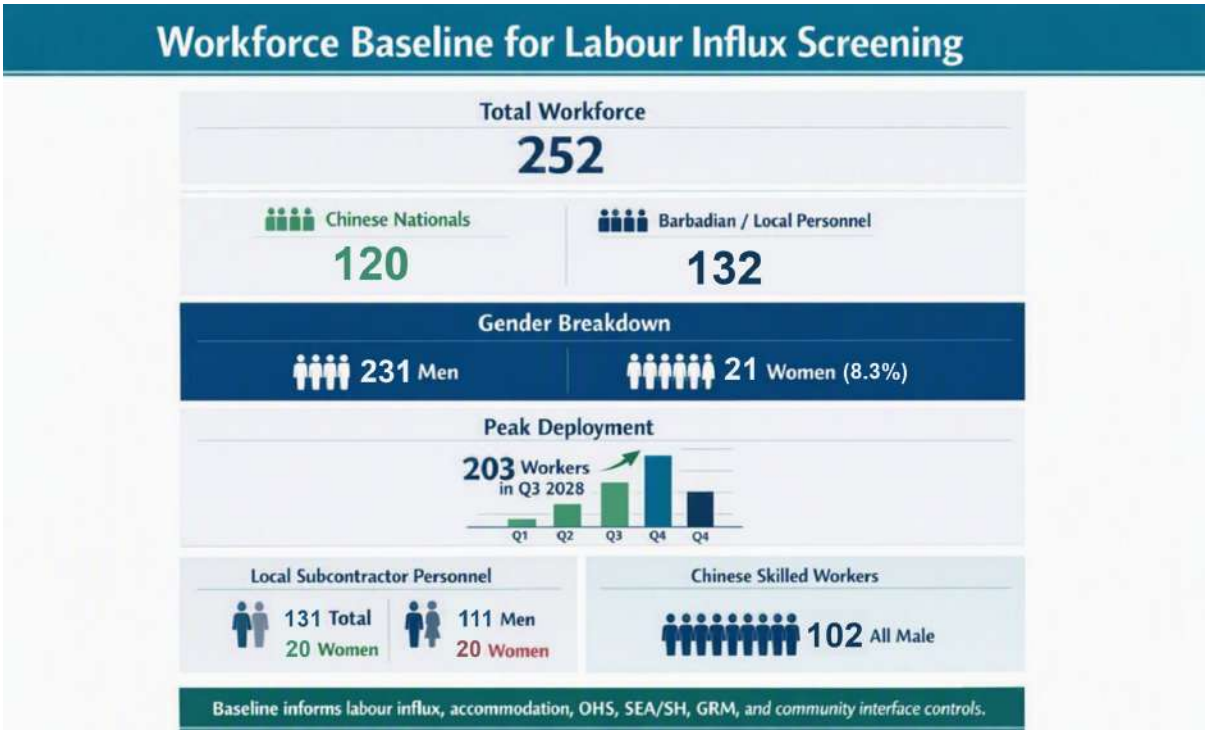


Figure 69**: Workforce baseline for labor influx screening. This image is AI generated and summarizes the workforce**

8.4.7.4. Recruitment and Employment Conditions

Recruitment for the SCWRRF and SCSTP will be conducted in a transparent, merit-based, and accessible manner. CRSEG is committed to ensuring that all employment opportunities are advertised and filled in ways that promote fairness and inclusivity with targeted efforts to reach women, youth,

PWDs, who are often under-represented in construction workforces. This means that recruitment processes will be free from bias and discrimination on the basis of sex, age, disability, nationality, pregnancy, ethnicity, religion, sexual orientation and other protected characteristics and will actively encourage participation from both Barbadian nationals and foreign workers, including Chinese nationals engaged by CRSEG as well as women, PWDs, younger and older workers and other vulnerable groups who may face barriers to entry. By adopting transparent procedures, the project will demonstrate compliance with Barbados' Employment Rights Act (2012) and IDB ESPS 2, which require fair treatment and equal opportunity for all workers.

Workforce Planning and Recruitment Strategy

The workforce will consist of a diverse mix of international specialists, local skilled trades, subcontractor personnel, and administrative staff. At the core of the team will be Chinese expatriate specialists employed by CRSEG, including senior engineers, project managers, and technical experts in water reclamation and treatment infrastructure. These individuals bring highly specialized skills and will provide technical leadership throughout the project lifecycle. Alongside them, Barbadian skilled workers will play a central role in plant operations, electrical and mechanical installation, welding, masonry, plumbing, carpentry, and heavy equipment operation. Local subcontractor personnel will provide essential support services such as general labor, driving, security, catering, cleaning, and camp management. The workforce will also include management and administrative staff: HR officers, health and safety representatives, camp managers, and community liaison officers drawn from both local and expatriate sources. Specialist consultants in environmental safeguards, gender equality, and occupational health will be engaged regionally and internationally to ensure compliance with IDB standards. Importantly, the recruitment strategy emphasizes inclusion of vulnerable groups, with targeted opportunities for women, persons with disabilities, and younger or older workers in support functions.

Workforce numbers will vary across project phases, ramping up during peak construction and stabilizing during operations. During the design phase (2026–2027), the workforce will remain relatively small, with approximately 30 to 40 professionals focused on engineering, planning, and safeguards. Numbers will increase during early works (2027–2028) to around 80 to 100 workers, as site preparation, camp setup, and utility installation begin. The peak construction phase in Q3 2028 will see the largest deployment, with approximately 203 workers engaged in heavy civil works and mechanical and electrical installation. At this stage, the workforce will be predominantly male, with 231 men and 21 women across the total planned workforce, highlighting the importance of gender-sensitive measures. As construction winds down, the commissioning phase in 2029 will require 60 to 80 workers, primarily technical specialists and plant operators responsible for testing, training, and handover. Once the facility enters operation in late 2029, the workforce will stabilize at 40 to 50 long-term staff, mainly local plant operators, maintenance personnel, and administrative staff. This pattern reflects a gradual ramp-up from design through early works, a sharp peak during construction, and a structured demobilization leading to a smaller, stable operational team.

Recruitment will follow a transparent and inclusive process designed to comply with Barbados labor legislation and IDB Environmental and Social Performance Standards. Workforce needs will be verified against project schedules before recruitment begins, ensuring that hiring is aligned with actual demand. Vacancies will be advertised publicly through Barbados employment portals such as Employs, as well as local newspapers, radio, and community boards. Outreach will extend to technical schools and

vocational training centers to encourage participation by younger workers and to build local capacity. Local employment will be prioritized, with preference given to Barbadian nationals and subcontractor personnel, alongside specific efforts to include women, persons with disabilities, and other vulnerable groups. Recruitment procedures will include strict verification of age, identity, and right to work, with written contracts provided in languages understood by workers. While recruitment agencies may be used by subcontractors, all hires must comply with the Labor Management Plan standards.

Non-discrimination is a cornerstone of the recruitment process. Discrimination based on sex, age, disability, nationality, race, religion, or sexual orientation is explicitly prohibited, and transparent selection criteria will be applied to all candidates. Mandatory induction and acknowledgment of the Workers' Code of Conduct will ensure that behavioral standards are upheld from the outset. Recruitment data will be collected and disaggregated by sex, age, nationality, and disability status, enabling monitoring of inclusion and identification of differential impacts. Regular audits and reporting will provide accountability and ensure that recruitment remains fair, transparent, and consistent with both national law and international best practice.

The recruitment pathway is illustrated in Figure 70.



Figure 70**: Recruitment principles roadmap. This image is AI generated and is intended to summaries the fair, transparent, inclusive, and compliant recruitment pathway described in this section**

The roadmap illustrates recruitment as a controlled sequence of decisions and safeguards rather than a one-time hiring action. It begins with a verified workforce need and moves through fair advertisement, transparent screening, merit-based selection, and clear contracting in a language understood by the worker. It then links recruitment to induction, Code of Conduct obligations, OHS training, grievance access, and equal opportunity monitoring. This sequence helps ensure that Barbadian nationals,

Chinese nationals, and subcontractor personnel are recruited and onboarded consistently, without discrimination, coercion, child labor, or gaps in worker protections.

Every worker engaged on the project, whether directly employed by CRSEG or through subcontractors, will receive a written contract in their native language. These contracts will clearly outline wages, working hours, benefits, grievance rights, and disciplinary procedures. Providing contracts in languages understood by workers ensures that they are fully aware of their rights and obligations and prevents misunderstandings that could lead to exploitation. This approach also reflects the project's commitment to accessibility and inclusivity, ensuring that language barriers do not prevent workers from exercising their rights.

Child labor and forced labor are strictly prohibited. CRSEG will enforce a zero-tolerance policy in line with Barbados' Labor Laws and IDB ESPS 2. Verification procedures will be put in place to ensure that all workers meet the minimum age requirements, and that no worker is coerced into employment. Subcontractors will be required to demonstrate compliance with these standards, and CRSEG will conduct regular audits to verify adherence. This ensures that labor practices across the entire workforce meet both national and international expectations. Identity verification will include cross-checking government-issued identification against employment records, ensuring that workers are legally authorized to work in Barbados. Subcontractors will be required to document these checks and submit compliance records to CRSEG's HR department. Written contracts will be issued in languages understood by workers, and contracts will clearly state terms of employment, rights, and responsibilities. This ensures transparency and prevents exploitation, particularly for migrant workers and younger recruits who may be less familiar with labor rights.

These labor standards also extend to how workers interact with the surrounding community. In alignment with the Community Health Plan, CRSEG recognizes that worker behavior and movement beyond the worksite can influence community health, safety, and social cohesion. The prohibition of child and forced labor and of SH/SEA/GBV therefore operates not only within the workplace but also across the broader worker-community interface.

Verification procedures will include checks on subcontractor practices, recruitment agents, and service providers to ensure that no minors or coerced individuals are engaged in any activity connected to the project or its supply chain. Verification begins with age checks to prevent child labor. No worker under the age of 18 will be employed, and all applicants must provide official documentation such as a national ID card, passport, or birth certificate to confirm legal adulthood. For young workers aged 18–24, additional attention will be given to verifying identity and right-to-work status, recognizing that this group may be entering the workforce for the first time and may require guidance in navigating formal employment processes. Supervisors and the Community Liaison Officer will monitor worker conduct in public spaces, vendor areas, and transport routes identified in the Community Health Assessment as potential interaction points.

By linking labor compliance with community health oversight, CRSEG ensures that labor standards are upheld 24 hours a day, both on-site and off-site, reinforcing the project's commitment to ethical employment and respectful community engagement and with social and gender safeguards.

Oversight of subcontractor labor practices is a critical component of the LMP. Local subcontractors will be engaged to provide specialized services, but they will be held to the same standards of labor management, occupational health and safety, environmental and behavioral expectations as CRSEG

employees. Contracts with subcontractors will include explicit provisions requiring compliance with the Workers' Code of Conduct, SH/SEA/GBV provisions and the LMP. CRSEG will monitor and report on subcontractor performance through audits, inspections, and grievance tracking, ensuring that subcontractor workers enjoy the same protections and rights as directly employed staff.

Induction training will be mandatory for all workers upon recruitment. This training will cover the Workers' Code of Conduct, occupational health and safety requirements, environmental topics, SEA/SH prevention, grievance procedures, and community interaction protocols. Induction sessions will be tailored to the diverse workforce, with materials provided in multiple languages and accessible formats. Refresher sessions will be scheduled regularly to reinforce awareness and compliance, ensuring that workers remain informed and engaged throughout the project lifecycle and that non-compliance with environmental, social and gender safeguards will be subject to corrective action and potential contract sanctions.

Importantly, the induction program is linked to and supported by the project's Health, Safety and Environmental Education and Training Plan, which establishes a three-tier training system (project-level, crew-level, and position-specific) as well as specialized modules for works at heights, high-risk work such as hot works, confined space entry, lifting operations, electrical works, among other topics. Daily toolbox talks, monthly themed safety sessions, including specialized training sessions on the Code of Conduct, gender sensitization and gender risk management, GRM and the Grand emergency response drills ensure that induction is not a one-time exercise but part of a continuous training cycle.

By embedding induction within this broader safety and security framework, the Labor Management Plan demonstrates how workforce orientation is triggered by and connected to other plans. This integration ensures that labor standards, occupational health and safety, environmental, community health, social and gender safeguards are consistently reinforced, monitored, and adapted throughout the project lifecycle.

Equal opportunity provisions will be embedded in recruitment and employment practices. CRSEG will ensure that no worker is discriminated against based on gender, ethnicity, disability, sexual orientation, or other protected characteristics. Reasonable accommodation will be provided for workers with disabilities, and gender-segregated sanitary facilities will be provided and maintained to promote dignity, privacy and safety. Training and advancement opportunities will be made available to all workers, with particular attention to ensuring that women and vulnerable groups are not excluded. The Grievance Redress Mechanism (GRM) will also be utilized, detailing its accessibility through multiple channels and strict safeguards for confidentiality and non-retaliation. It includes specialized, survivor-centered pathways for SEA/SH and GBV concerns, ensuring non-retaliation and referral support. This robust system addresses discrimination, harassment (including sexual and gender-based), exploitation, and other grievances for all workers and community members. These measures align with IDB ESPS 2 and ESPS 9 on Labor and Working Conditions and Gender Equality and demonstrate CRSEG's commitment to inclusivity, safe and non-discriminatory work environment.

Recruitment processes will also emphasize cultural sensitivity and cohesion. With Chinese nationals and Barbadian nationals working side by side, induction training and refreshers will include modules on intercultural communication, respect for diversity, and conflict resolution, gender sensitization and gender risk management. Supervisors will be trained to monitor interpersonal dynamics, non-discriminatory leadership, local gender norms and legal protections in Barbados and intervene promptly

in cases of discrimination, harassment, or conflict. By fostering mutual respect and understanding, CRSEG will create a cohesive workforce that can collaborate effectively across cultural and national boundaries.

Monitoring and reporting will be integral to recruitment and employment practices. CRSEG will collect disaggregated data on age, sex, disability, nationality, and vulnerability status, and use this data to monitor inclusion and identify disparities and analyzed to identify patterns of under-representation, pay gaps and higher grievance rates among certain groups. Regular audits will be conducted to verify compliance with recruitment and employment standards, and corrective measures/actions will be designed and implemented based on analysis where necessary. This approach ensures that recruitment and employment practices remain fair, inclusive, and responsive to emerging risks.

Finally, recruitment and employment conditions will be communicated transparently to workers and stakeholders (such as government regulators, community members, vulnerable and marginalized groups, civil society and non-governmental organizations, and education institutions near the site). Information on recruitment processes, employment rights, and grievance mechanisms will be disclosed through accessible materials and engagement sessions. Information reaches women and vulnerable groups through multilingual and accessible formats, mandatory tailored training, community outreach via a CLO, and confidential, survivor-centered grievance channels. Continuous feedback is integrated via structured consultations, disaggregated data analysis, and grievance tracking to ensure responsiveness and adaptive management. The Project Manager submits various labor-related reports to the PEU, including regular OHS data, incident reports, and anonymized SEA/SH/GBV summary findings. Annual Labor Management Plan reviews and escalated serious or unresolved issues are also reported. This transparency builds trust among workers and communities and demonstrates CRSEG's commitment to accountability. By embedding fairness, inclusivity, and equal opportunity into recruitment and employment practices, the project will meet the expectations of the BWA, the Government of Barbados, and the IDB.

Worker Welfare and Accommodation

Worker welfare and accommodation are central to the LMP, as they directly affect the health, safety, and productivity of the workforce. CRSEG recognizes that the Workers' Camp will serve as both a living and working environment for Chinese nationals, Barbadian nationals, and subcontractor personnel. The standards set for accommodation and welfare facilities must therefore reflect not only national legislation but also international best practice and also incorporate zero tolerance for SH/SEA/GBV within worker accommodations, ensuring that all workers are treated with dignity and respect. The design and management of worksites will consider the specific needs of women and vulnerable groups.

Accommodation facilities will be designed to provide safe, clean, and habitable living conditions. Each worker will be provided with adequate space, ventilation, lockable rooms and privacy, and access to potable water and electricity. Waste management systems will be implemented to ensure proper disposal of solid and liquid waste, thereby preventing environmental contamination and health risks. These measures align with Barbados' Health Services Act and IDB ESPS 2, which require employers to provide safe and healthy living conditions for workers.

Sanitary facilities will be gender-segregated and maintained to high hygiene standards. CRSEG will ensure that toilets, showers, and washing facilities and rest areas are sufficient in number, accessible, private, safe, lockable and regularly cleaned (twice daily on a weekly schedule) with disposal facilities for menstrual products and consideration of menstrual hygiene management in cleaning protocols. Reasonable accommodation will be made for workers with disabilities, including accessible toilets and bathing facilities, ramps, bars etc. These provisions demonstrate compliance with non-discrimination and equal opportunity principles, ensuring that all workers can live and work in dignity regardless of gender or physical ability.

Medical care will be readily available to workers through on-site health services or nearby clinics. CRSEG will establish protocols for medical screenings, emergency response, and referral to specialized care including sexual and reproductive health services and psychosocial support, for women and survivors of SH/SEA/GBV where necessary. Preventive health measures, such as vaccination campaigns and hygiene awareness sessions, will be implemented to reduce the risk of communicable disease transmission. These measures are particularly important given the anticipated influx of workers from different countries, which may increase exposure to new health risks.

Recreational spaces will be provided to promote worker well-being and social cohesion. Facilities such as common rooms, rest areas, sports areas, and outdoor spaces that are inclusive for women and vulnerable groups will allow workers to relax and interact outside of working hours. Communication facilities, including internet access and phone services, will be made available to ensure that workers can maintain contact with their families and communities. These services are essential for mental health and morale, particularly for foreign workers who may be far from home.

Regular inspections of accommodation and welfare facilities will be conducted fortnightly to ensure compliance with health and safety standards. A gender sensitive checklist (privacy, safety, hygiene for women's and men's facilities and accommodations) will also be included. Findings will be documented in compliance monthly reports, and corrective actions will be implemented promptly. Inspections will cover cleanliness, functionality of utilities, safety and privacy, adequacy of space, and accessibility of facilities. By maintaining rigorous inspection protocols, CRSEG will demonstrate accountability and continuous improvement in worker welfare.

Camp rules will be consistent with the Workers' Code of Conduct and will strictly prohibit weapons, alcohol, smoking, vaping, and drugs, bullying, discrimination, any form of harassment, SH/SEA/GBV. Such violations can lead to dismissal and referral to authorities. These rules are designed to maintain order, safety, and respect within the camp environment. Enforcement will be carried out by supervisors and the Health, Safety and Environment (HSE) Representative, with disciplinary measures applied to violations. By embedding behavioral expectations into camp rules, CRSEG ensures that welfare facilities remain safe and conducive to productivity. The camp rules carry the neighboring land and agricultural property provisions of the Code of Conduct (Section 8.4.8.6) as a standing rule of residence: no entry to neighboring farms, agricultural plots or private property without authorization, no use of them as shortcuts or gathering places, and no taking, harvesting, consuming or damaging of crops, fruit or livestock. The rule is posted at the campsite in English and Standard Chinese, is covered at induction and at the briefing given before a worker takes up accommodation, and is verified at the monthly camp inspection, with findings recorded in the inspection log and reported in the monthly performance report. Commitments C-34 and C-35 in the Commitments Register at Annex H carry the issue and verification duties.

Inclusivity will be a guiding principle in the design and management of welfare facilities. Discrimination, harassment or violence based on sexual orientation, gender identity, nationality or other status is strictly prohibited in the workers' camp. CRSEG will ensure that women, youth, persons with disabilities, and migrant workers have equal access to accommodation, facilities and services. Training and refreshers will be provided to supervisors and camp managers on inclusivity and non-discrimination, gender sensitization and gender risk management and the GRM, ensuring that vulnerable groups are not excluded or marginalized. This approach aligns with IDB ESPS 9 on Gender Equality and demonstrates CRSEG's commitment to equitable treatment.

Finally, worker welfare and accommodation will be integrated into the broader monitoring and reporting framework of the LMP. Data on accommodation standards, health services, recreational facilities, and compliance with camp rules will be collected and analyzed. Grievances related to welfare and accommodation will be tracked through the Worker's Grievance Redress Mechanism (GRM), ensuring that worker concerns are addressed promptly and transparently. By embedding welfare and accommodation into monitoring systems, CRSEG ensures that these provisions remain effective, responsive, and aligned with both national and international standards. Inspection and reporting will be documented through standardized checklists, with data disaggregated by sex, age, nationality, and disability. This allows patterns of exclusion or risk to be identified, analyzed, and managed through corrective actions and adaptive updates to the Labor Management Plan.

Occupational Health and Safety (OHS)

Occupational health and safety are a keystone of the LMP and a fundamental obligation of CRSEG in delivering the SCWRRF and SCSTP projects. The safety of workers, subcontractors, and surrounding communities is paramount, and the LMP establishes a comprehensive framework to prevent accidents, protect health, and promote a culture of safety. This framework is aligned with Barbados' Safety and Health at Work Act (Cap. 356), which enshrines the right of workers to refuse unsafe work, and with IDB ESPS 2 and ESPS 4, which require employers to provide safe working conditions and protect community health and safety.

It is important to note that while OHS provisions appear across several project documents, the Labor Management Plan (LMP), the Workers' Code of Conduct and the Health and Safety Plan and Management Manual, the intent is not duplication but reinforcement. The LMP provides the overarching framework and workforce obligations, the Code of Conduct sets behavioral standards and sanctions for breaches, while the Health and Safety Plan and Management Manual serve as the detailed technical references covering all procedures, hazard controls, PPE requirements, emergency preparedness, and monitoring systems. To avoid repetition, the LMP makes reference to the HSE Management Manual and Plan as the authoritative sources for operational detail, ensuring consistency and alignment across all documents while maintaining clarity of roles and responsibilities.

8.4.7.5. Gender-Specific and Vulnerability-Specific OHS Risks and Measures

Occupational health and safety risks are not experienced uniformly; they can vary significantly depending on gender, age, disability, and migrant status. For women workers, risks include inadequate privacy in sanitation facilities, exposure to harassment or SEA/SH/GBV, and exclusion from PPE designed for male body types. Migrant workers may face language barriers that limit their understanding of safety protocols, as well as heightened vulnerability to SEA/SH/GBV.

Risk management measures will be tailored to these vulnerabilities. For women, gender-segregated facilities, SEA/SH/GBV awareness training, and provision of appropriately sized PPE will be mandatory. Migrant workers will receive induction materials in accessible languages and pictogram-based safety instructions. Persons with disabilities will be accommodated through accessible infrastructure, task adjustments, sign language interpretation where feasible, and inclusive training. Young workers will be paired with mentors, shielded from high-risk tasks until adequately trained, and supported through targeted induction sessions.

All OHS data will be disaggregated by sex, age, nationality, and disability status, worker category, contractor vs. subcontractor, enabling the project to identify patterns of exclusion or disproportionate risk. Findings will be addressed through corrective actions, adaptive management, and regular reporting to the Barbados Water Authority and the PEU. This ensures that fairness, inclusivity, and equal opportunity are embedded into OHS practices, and that vulnerable groups are fully considered and integrated into the project's safeguards framework.

The Health and Safety Plan and Management Plan will be implemented across all sites, procedures and activities of the workers campsite, the SCWRRF and the SCSTP. These documents set out detailed procedures for hazard identification, including gender-specific and vulnerability-specific hazards, risk assessment and mitigation measures.

Particular attention will be given to time-sensitive situations, such as equipment failures, confined-space hazards, chemical spills, fires, severe weather, medical emergencies, or unsafe work observations, where delayed communication could increase harm. Evacuation routes and muster points will be designed to be safe, well-lit and accessible for women, and PWDs with attention to management of harassment risks. The LMP will therefore require clear escalation protocols, designated bilingual focal points where available, agreed emergency words or signals, and regular multilingual drills so that all workers can quickly alert others, understand instructions, evacuate, seek help, and respond safely without hesitation or confusion.

To operationalize these requirements, CRSEG will include the following language-responsive safety actions in the LMP implementation program:

- Establish clear escalation protocols for safety concerns, incidents, near misses, unsafe work observations, medical emergencies, environmental releases, fires, severe weather alerts, and other time-sensitive events, including who must be contacted, in what order, and by what communication channel.
- Identify and formally designate bilingual focal points for key work areas, shifts, high-risk activities, camp operations, subcontractor teams, and emergency response functions, with names, roles, contact details, and availability communicated during induction, toolbox talks, and posted notices.
- Agree and train all workers on common emergency words, hand signals, stop-work signals, alarms, color codes, and visual alerts that can be understood quickly across language groups, including Chinese nationals, Barbadian nationals, and subcontractor personnel.
- Conduct regular multilingual drills and practical simulations for evacuation, muster procedures, fire response, first aid response, spill response, severe weather events, confined-space emergencies, equipment isolation, and other credible project scenarios.

- Record participation, comprehension checks, corrective actions, and lessons learned from these drills and communication controls as part of LMP monitoring and OHS reporting.
- Safety materials will be designed for workers with low-literacy, using pictograms, demonstrations, and verbal explanations.
- Participation drills will be monitored and disaggregated by sex, nationality, disability status, and contractor/subcontractor to ensure that women and vulnerable groups are fully included.

Workers will have the legal right to refuse unsafe work without fear of reprisal, in accordance with Barbados law. This right will be communicated clearly during induction training and reinforced through daily toolbox talks. Supervisors will be trained to respect and uphold this right, and mechanisms will be established to investigate and resolve safety concerns promptly. By empowering workers to protect themselves, CRSEG fosters a culture of shared responsibility for safety. Workers may also use confidential or anonymous channels through the workers' GRM to report unsafe conditions if they do not feel comfortable raising issues directly with supervisors.

Routine audits, accident reporting, and corrective action tracking will ensure that safety standards are consistently upheld. Audits will include specific checks on gender-sensitive and inclusive OHS measures. The HSE Representative will lead audits and inspections, documenting findings and implementing corrective measures. Audit processes will include confidential feedback from women workers, migrant workers and PWDs to identify hidden risks or barriers. Accident and incident reports will be logged, analyzed, and used to inform continuous improvement. Lessons learned from incidents will be shared with workers and supervisors, ensuring that mistakes are not repeated and that safety practices evolve over time.

Inclusivity will be embedded in OHS practices. Training and safety protocols will be designed to accommodate workers with different levels of literacy, language proficiency, and physical ability. Gender-sensitive and inclusive measures will be implemented to protect all workers, particularly women workers, LGBTIQ+ workers and PWDs including safe, accessible and separate sanitary facilities, reasonable accommodation measures and clear protocols to prevent and respond to harassment, discrimination and SH/SEA/GBV. These measures align with IDB ESPS 9 on Gender Equality and demonstrate CRSEG's commitment to equitable safety practices. Finally, occupational health and safety will be integrated into the broader monitoring and reporting framework of the LMP. Data on accidents, incidents, PPE compliance, training participation, and emergency drills will be collected and analyzed. Disaggregated data will be used to identify disparities and inform adaptive management measures. Grievances related to OHS will be tracked through the Worker's GRM, ensuring that worker concerns are addressed promptly and transparently. By embedding OHS into monitoring systems, CRSEG ensures that safety provisions remain effective, responsive, and aligned with both national and international standards.

8.4.7.6. Labor Influx Risk Management

The labor influx screening confirms that the project presents a High residual GBV/SEA/SH risk requiring enhanced management. The risk is not driven only by workforce size, but by the combination of a large and predominantly male workforce, non-local labor presence, nearby residential and community receptors, worker movement outside the site, language requirements, economic asymmetry, and the severe consequence profile of SEA, SH and GBV incidents. The Community Health Assessment identifies SEA, SH and GBV as a standalone health determinant pathway, CH-08 (Sexual Exploitation and Abuse,

Sexual Harassment and Gender-Based Violence), linked to workforce presence, economic asymmetry, and reporting barriers. The labor influx assessment will be updated periodically with specific attention to impacts on women and girls, female-headed households, PWDs and other vulnerable groups and will be directly linked to the SH/SEA/GBV Prevention and Response Plan and GRM.

The exposure routes are worker movement in surrounding communities; interaction with residents, vendors, local businesses, schools, transport routes, and nearby residential areas; language and communication barriers; possible under-reporting due to fear, stigma, retaliation, or lack of accessible channels; and heightened vulnerability among women and girls, children, older persons, persons with disabilities, and lower-income households.

Because women make up a small minority of the project workforce, the LMP commits to implementing targeted measures to ensure their safety, dignity, and full inclusion. These measures include gender-segregated and well-lit facilities, privacy and security protocols for accommodation and sanitation areas, provision of appropriately sized PPE, and tailored OHS training that addresses gender-specific risks. In addition, confidential grievance channels and survivor-centered SEA/SH referral pathways will be reinforced to protect female workers from harassment or exploitation, while mentoring and professional development opportunities will support their progression in a male-dominated environment.

Beyond the worksite, the plan identifies community risk "hotspots" such as residential areas adjacent to the campsite, school zones along narrow access roads, and informal vending locations where workers and residents interact. These areas are particularly sensitive for women and girls who may also face intersecting vulnerabilities as migrants, persons with disabilities, or members of low-income households. The LMP therefore integrates intersectional safeguards to ensure that gender, poverty, disability, and migration status are considered together, reducing compounded risks and promoting equitable treatment both within the workforce and at the worker-community interface.

The screening ratings and their management implications are summarized in Table 134.

Table** 134**: Labor influx GBV/SEA/SH risk rating summary

Risk Element	Screening Rating	Management Implication
Pre-mitigation likelihood	Possible	Controls must be in place before mobilization and reinforced during peak deployment.
Pre-mitigation consequence	Catastrophic	Survivor-centered prevention and response must be treated as a priority safeguard.
Pre-mitigation significance	Very High	Enhanced management, supervision, and reporting are required.
Post-mitigation likelihood	Unlikely	Likelihood may be reduced only where controls are fully implemented and verified.
Residual significance	High	Residual risk remains a priority for auditing, supervision, grievance monitoring, and corrective action.

Minimum required controls include mandatory Code of Conduct signing before site access; GBV/SEA/SH induction before mobilization and quarterly refreshers; written materials in English and Standard Chinese with spoken interpretation based on confirmed language needs; a worker-community interaction protocol; confidential and anonymous reporting channels separate from the general grievance log for sensitive cases; a verified survivor referral directory; and community awareness sessions designed and delivered in collaboration with relevant service providers including NGOs, local police, medical professionals, and social support agencies to ensure that women, men, boys, girls, persons with disabilities, and other vulnerable groups can safely participate and receive accurate, accessible information.

All subcontractors, supervisors, security personnel, and outsourced service providers who interact with communities will be required to sign the Project Code of Conduct. In addition, they will undergo mandatory training on the Grievance Redress Mechanism (GRM), gender sensitization, and gender risk management to strengthen accountability, reinforce respectful conduct, and reduce risks of discrimination, harassment, or exploitation in community interfaces. The controls also include confidential case management, sanctions for substantiated breaches, and monthly and quarterly monitoring of training, channel functionality, complaint trends, and corrective action close-out.

Immediate escalation to the Project Manager, Community Health Focal Point, and designated confidential case-handling function is required for any allegation of SEA, SH, GBV, or child protection concern; any report of retaliation, intimidation, or pressure; any indication that confidential reporting channels are not functioning or accessible; repeated worker conduct complaints from the same location, vendor area, transport route, or accommodation interface; failure to complete Code of Conduct signing or GBV/SEA/SH induction before site access; or any change in workforce numbers, accommodation, rotation, or transport arrangements that increases worker-community contact.

8.4.7.7. Roles and Responsibilities

Effective implementation of the LMP requires clear definition of roles and responsibilities across all levels of the project and across the integrated workforce model. Accountability must cover Chinese nationals employed directly by CRSEG, Barbadian nationals engaged through direct hire, and local subcontractors providing project services. Each role must therefore support fair recruitment, safe and dignified working and living conditions, occupational health and safety, language-responsive communication, knowledge transfer, grievance access, and compliance with Barbados legislation, the expectations of the BWA, and the requirements of the IDB's ESPS.

The following graphics summarize the accountability structure and show how responsibilities may overlap or merge depending on the nature, urgency, severity, and confidentiality of a labor or working-conditions issue (see Figures 71 and 72).



Figure 71: Roles and responsibility coverage map. This image is AI generated and is intended to show role-specific accountability areas and crossover points where shared coordination is required

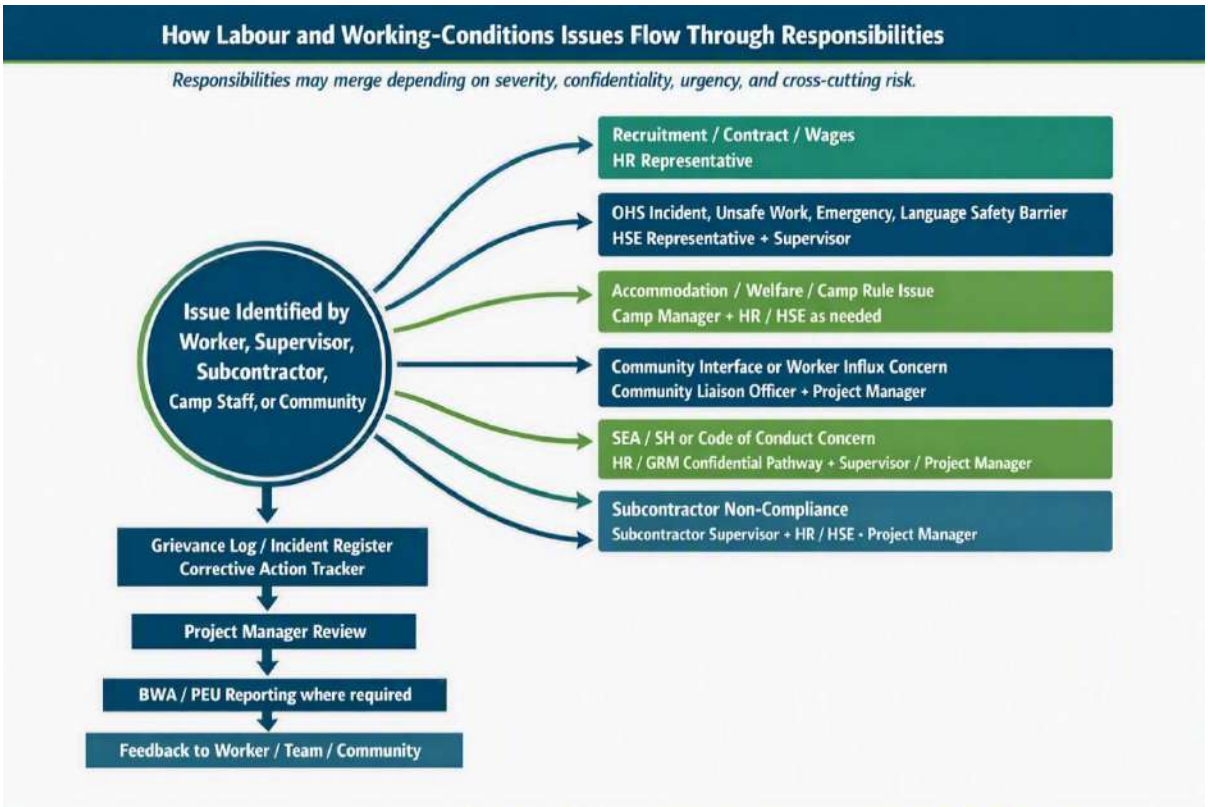


Figure 72: Responsibility flow for labor and working-conditions issues. This image is AI generated and is intended to show how issues may move through different responsible roles and merge into common registers, corrective actions, reporting, and feedback loops

Together, the visuals clarify that accountability under the LMP is both role-specific and coordinated. Each function retains a clear lead responsibility, but crossover issues are managed through defined escalation, joint review, shared registers, and corrective action tracking. For example, recruitment and contract concerns are led by HR, while safety issues are led by HSE; however, matters involving language barriers, subcontractor practices, worker accommodation, SEA/SH, or community interaction may require coordinated action by supervisors, the Camp Manager, the Community Liaison Officer, subcontractors, and the Project Manager. To avoid confusion, the first responsible officer records the issue, identifies required supporting roles, confirms confidentiality requirements, and escalates to the Project Manager or Grievance Redress Committee where the matter is serious, unresolved, cross-cutting, or reportable to the Supervision Firm and the SCWRP PEU / BWA.

Please refer to the Code of Conduct for the role of the Project Manager. The HR Representative is responsible for gender-sensitive recruitment, contracts, induction, training coordination, employment records, and worker grievance procedures. This role includes implementing the recruitment principles roadmap by verifying workforce needs, supporting fair advertisement and local outreach, applying transparent screening and merit-based selection, ensuring contracts are provided in a language understood by each worker, and preventing discrimination, child labor, forced labor, and coercive recruitment practices. The HR Representative will also ensure that Chinese nationals, Barbadian nationals, and subcontractor personnel receive induction on the LMP, Workers' Code of Conduct, OHS obligations, SEA/SH prevention, grievance access, equal opportunity, and intercultural respect.

The HSE Representative is responsible for enforcing occupational health and safety standards for all workers and subcontractors. This role includes overseeing hazard identification, risk assessment, PPE compliance for male and female workers and workers with disabilities, high-risk task controls, audits, incident reporting, corrective action tracking, emergency preparedness, and the legal right of workers to refuse unsafe work. In line with the updated OHS provisions, the HSE Representative will also manage language differences as a safety risk by ensuring that safety-critical instructions, warning signs, emergency alerts, stop-work signals, muster information, and incident reporting procedures are understood by the workforce. This includes establishing data and analysis in a disaggregated form to identify any unequal risk patterns and to adjust measures and controls accordingly, escalation protocols, identifying bilingual focal points, agreeing emergency words and signals, conducting multilingual drills, and recording comprehension checks and lessons learned as part of OHS reporting.

The Community Liaison Officer serves as the bridge between CRSEG and affected communities and supports alignment between the LMP and the Community Health and Safety Plan. This role includes gender-sensitive and inclusive engagement, monitoring community concerns, facilitating dialogue, supporting disclosure of workforce-related information, coordinating community awareness sessions, and escalating relevant issues to the PEU. The Community Liaison Officer will work with HR, HSE, camp management, and be trained to safely receive and refer SH/SEA/GBV complaints in coordination with the Social Personnel and subcontractor supervisors to ensure that worker influx, transport, camp-community interaction, grievance access, SEA/SH prevention, and public health matters are managed consistently and transparently.

Subcontractors are responsible for ensuring that their personnel comply with the LMP, the Workers' Code of Conduct, OHS requirements, recruitment standards, accommodation and welfare rules where applicable, and project grievance mechanism. Contracts with subcontractors will include explicit provisions requiring adherence to labor management, occupational health and safety, behavioral standards, language-responsive safety arrangements, and participation in relevant induction, toolbox talks, emergency drills, and technical capacity-building activities. Subcontractors will be subject to audits, inspections, and corrective actions, and persistent non-compliance may result in suspension of work or termination of contracts.

Supervisors play a critical role in translating the LMP into daily practice. They are responsible for ensuring that workers comply with the Code of Conduct, use PPE correctly, follow safe work procedures, report hazards, and participate in training, drills, toolbox talks, and knowledge-transfer activities. Supervisors are accountable for maintaining a work environment free from discrimination, harassment and SH/SEA/GBV, responding promptly and appropriately to any such reports and ensuring no retaliation occurs against witnesses or complainants. They will monitor interpersonal dynamics among Chinese nationals, Barbadian nationals, and subcontractor personnel, intervene promptly in cases of discrimination, harassment, conflict, or unsafe behavior, and confirm that workers understand safety instructions, emergency signals, escalation pathways, grievance channels, and camp rules. They will also support mentoring arrangements by creating practical space for local workers and subcontractors to observe, practice, ask questions, and progressively take on technical responsibilities.

The Camp Manager, in coordination with HR and HSE, is responsible for implementing worker welfare and accommodation requirements. This includes maintaining safe, clean, well-lit routes, lockable rooms, adequate menstrual hygiene management facilities, and dignified accommodation; ensuring gender-segregated sanitary facilities; supporting reasonable accommodations for persons with disabilities; managing access to medical care, recreational areas, and communication facilities; enforcing camp rules consistent with the Workers' Code of Conduct; and prompt response to any reports of harassment or SH/SEA/GBV within the workers camp, documenting regular inspections and corrective actions. The Camp Manager will also ensure that camp information, safety notices, emergency instructions, grievance channels, and welfare arrangements are communicated in languages and formats understood by residents.

Individual workers are responsible for complying with the Code of Conduct and the provisions of the LMP. This includes respecting colleagues and community members, using PPE correctly, participating in induction, refresher training, multilingual drills, toolbox talks, and technical learning opportunities, and reporting unsafe conditions, any observed discrimination, harassment, SH/SEA/GBV involving colleagues or community members, incidents, grievances, or Code of Conduct violations. Workers are empowered to refuse unsafe work without fear of reprisal and are encouraged to use grievance channels when concerns arise. By holding workers accountable for their own behavior while ensuring that they receive clear information and training, CRSEG fosters a culture of shared responsibility across the integrated workforce.

Finally, monitoring and reporting responsibilities will be distributed across all roles and will reflect the commitments added throughout this LMP. The Project Manager will oversee reporting to the Supervision Firm and the SCWRP PEU, while the HR Representative, HSE Representative, Community Liaison Officer, Social Personnel, Camp Manager, subcontractors, and supervisors will collect and analyze data within their respective domains. Monitoring will include recruitment and onboarding records, workforce

composition, subcontractor compliance, accommodation inspections, OHS incidents, multilingual drills, bilingual focal point arrangements, grievance trends, welfare concerns, training participation, and knowledge-transfer activities. This integrated approach ensures that accountability is shared, that the workforce model is managed consistently, and that continuous improvement through monitoring and lessons learned is achieved across the LMP.

8.4.7.8. Monitoring and Reporting

Monitoring and reporting are integral to the effectiveness of the LMP, providing the evidence base needed to demonstrate compliance, identify gaps, and drive continuous improvement. Effectiveness is defined as the ability of the LMP to ensure safe, fair, and inclusive labor practices that uphold gender equality, prevent SEA/SH/GBV, and promote the meaningful participation of all worker groups. CRSEG recognizes that labor management is not static; it requires ongoing oversight, documentation, and adaptation informed by indicators and feedback from women, youth, migrants, and other vulnerable groups. Monitoring will therefore track gender equality outcomes, inclusion of marginalized workers, and SEA/SH/GBV prevention measures alongside traditional compliance metrics, ensuring that the LMP evolves responsively to workforce realities and community expectations.

Effectiveness and Gender-Responsive Indicators

The effectiveness of the Labor Management Plan (LMP) will be measured by its ability to ensure equitable treatment, safeguard rights, and reduce risks for all workers and affected communities, with particular attention to women, youth, migrants, persons with disabilities, LGBTIQ+ persons, older workers and other vulnerable or marginalized groups. Effectiveness is defined as the consistent achievement of the following outcomes:

- **Gender equality**: Increased representation of women in recruitment, training, and advancement; equitable access to facilities, PPE, and welfare provisions; and reduction of gender-differentiated barriers. Reduced gender gaps in job categories, contract types and remuneration.
- **Inclusion**: Demonstrated participation of vulnerable groups in training, grievance mechanisms, and decision-making processes, with disaggregated monitoring by sex, age, disability, and nationality.
- **SEA/SH/GBV prevention**: Zero tolerance for harassment and exploitation, measured through Code of Conduct compliance, survivor-centered grievance pathways, confidential reporting uptake, and sanctions for breaches. Effectiveness will be assessed not only by reported case numbers, but also by evidence of trust in reporting channels, awareness levels among workers and communities and the timely, survivor-centered handling of cases, recognizing that under-reported is common.

Indicators will include:

- Workforce composition by sex, age, nationality, disability, and job category.
- Number and percentage of women and vulnerable groups participating in induction, training, and welfare programs.
- Frequency and resolution of grievances disaggregated by type, sex, age, and vulnerability status.

- Uptake of SEA/SH/GBV awareness sessions and referrals to survivor-centered support services.
- Community feedback on safety and inclusion in identified “hotspots” such as school zones, vending areas, and residential interfaces.

The LMP will be informed by continuous feedback from women, youth, migrants, and other vulnerable groups through structured consultations, grievance data, and monitoring reports. This feedback will guide **adaptive management**, ensuring that corrective actions are responsive to lived experiences and that safeguards remain relevant as workforce and community conditions evolve. Consultations will be organized in formats that are safe and accessible for women, PWDs, low-literacy groups and migrants. Feedback and recommendations from these groups will be documented and reflected in action plans and subsequent LMP revisions.

The compliance traceability framework is presented in Table 135.

Monthly labor audits will be conducted to review contracts, working hours, welfare facilities, and occupational health and safety compliance. These audits and disaggregated data analysis should review gender and nationality patterns in job categories, pay, training access, contract type, grievances and disciplinary measures as well as patterns by age, disability status, migrant status and contractor/subcontractor and together these should inform targeted actions to correct identified risks and inequities.

This disaggregation ensures that monitoring captures the experiences of diverse groups, including women, youth, persons with disabilities, and migrant workers. By analyzing disaggregated data, CRSEG can identify disparities, prevent exclusion, and ensure that vulnerable groups are equitably included in project benefits. All disaggregated data will be handled in compliance with data protection laws and confidentiality standards to avoid stigmatization or harm. This approach demonstrates compliance with IDB ESPS 9 on Gender Equality and ESPS 10 on Stakeholder Engagement.

Grievances, incidents, and corrective actions will be systematically tracked through the Grievance Redress Mechanism. The grievance log will record complaints, actions taken, and outcomes, with monthly reviews conducted to identify patterns and recurring issues. SEA/SH-related grievances will be tracked separately to ensure confidentiality and survivor-centered handling. Monitoring will include analysis of whether women, migrants, PWDs and other vulnerable groups are using the GRM at similar rates and whether there are signs of under-reporting. Anonymized SH/SEA/GBV-related information will be shared in a way that cannot be traced back to the individuals or specific small groups, especially in small communities or work teams. By integrating grievance data into monitoring systems, data protection measures, trend analysis and commitment to share anonymized summary findings with workers, communities and the PEU while safeguarding identities, CRSEG ensures that worker and community concerns inform continuous improvement.

Incident reporting will be a key component of monitoring. All accidents, near misses, safety violations and grievances will be documented, data will be disaggregated, analyzed, and used to inform corrective actions. Incident analysis will distinguish incidents with a gender or social dimension to ensure appropriate remedies and prevention. Where incidents result in physical or psychological harm, affected workers will be informed about and referred to the appropriate support services. Lessons learned from incidents will be shared with workers and supervisors, ensuring that mistakes are not repeated. Incident data will also be reported to the BWA and the PEU, demonstrating transparency and accountability.

Annual reviews of the LMP will be undertaken with CRSEG, the Barbados Water Authority, and the PEU. These reviews will incorporate stakeholder feedback, including targeted consultations with women workers, migrant workers, PWDs and community representatives to validate findings and propose improvements, audit findings, grievance data, and incident reports. The annual review will assess the effectiveness of labor management measures, identify areas for improvement, and update the LMP, as necessary. By conducting annual reviews, CRSEG ensures that the LMP remains relevant, responsive, and aligned with evolving project risks.

Adaptive management will be applied to refine controls based on monitoring results. This means that policies, procedures, and training will be updated in response to emerging risks, grievances, and stakeholder feedback. Adaptive management ensures that the LMP is not static but evolves to meet the needs of workers and communities. It will prioritize interventions that address documented disparities affecting women, youth, migrants, LGBTIQ+ persons and other vulnerable groups, ensuring that their specific risks are addressed promptly. This approach aligns with IDB ESPS 1 on Assessment and Management of Environmental and Social Risks and Impacts, which requires continuous improvement in risk management.

Stakeholder engagement will be integrated into monitoring and reporting. The Stakeholder Engagement Plan will include monitoring and reporting procedures. Workers and communities will be consulted on the effectiveness of labor management measures, and their feedback will be incorporated into audits and reviews. Engagement will use gender-sensitive and inclusive methods (e.g. separate focus groups for women and youth, accessible venues and formats for PWDs, interpreters for migrants) and will be scheduled at times that do not conflict with care responsibilities or wage-earning work. Engagement sessions will provide opportunities for stakeholders to validate monitoring findings and suggest improvements. Findings from engagement will be documented in action plans, with clear timelines and responsibilities for follow-up and progress will be fed back to stakeholders. By involving stakeholders in monitoring, CRSEG ensures that the LMP is grounded in lived experiences and trusted by those it affects.

Finally, monitoring and reporting responsibilities will be distributed across all roles. The Project Manager will oversee reporting to the Supervision Firm and the SCWRP PEU /Barbados Water Authority, while the HR Representative, HSE Representative, Social Personnel and Community Liaison Officer will collect and analyze data within their respective domains. Subcontractors and supervisors will provide input through audits and inspections, and workers will contribute through grievance submissions. This integrated approach ensures that monitoring is comprehensive, accountability is shared, and continuous improvement is achieved.

Table 135***: Compliance matrix annex***

LMP Section	Relevant Barbados Legislation	Applicable IDB ESPS	Key Compliance Measures	Responsible Party
Introduction	Employment Rights Act (2012); Safety and Health at Work Act (Cap. 356); Health Services Act (Cap. 44)	ESPS 1 (Risk Management); ESPS 2 (Labor); ESPS 4 (Community Health & Safety); ESPS 9 (Gender Equality); ESPS 10 (Stakeholder	Establishes framework for fair labor practices, compliance traceability, and integration with Code of Conduct and GRM.	Project Manager

LMP Section	Relevant Barbados Legislation	Applicable IDB ESPS	Key Compliance Measures	Responsible Party
		Engagement)		
Workforce Profile	Employment Rights Act; Labor Laws of Barbados	ESPS 2; ESPS 9; ESPS 10	Defines workforce composition (Chinese nationals, Barbadian nationals, subcontractors); inclusivity for vulnerable groups; disaggregated data collection	HR Representative
Recruitment & Employment Conditions	Employment Rights Act; Labor Laws	ESPS 2; ESPS 9	Transparent, merit-based recruitment; contracts in native languages; prohibition of child/forced labor; subcontractor oversight	HR Representative
Worker Welfare & Accommodation	Health Services Act; Labor Laws	ESPS 2; ESPS 9	Safe, clean accommodation; gender-segregated facilities; medical care, recreation, communication; inspections documented	Camp Manager / HR Representative
Occupational Health & Safety (OHS)	Safety and Health at Work Act (Cap. 356)	ESPS 2; ESPS 4	Workers' Health & Safety Plan; PPE mandatory; emergency preparedness; right to refuse unsafe work; audits and corrective actions, Code of Conduct	HSE Representative
Community Health & Safety	Health Services Act; Environmental Regulations	ESPS 4; ESPS 10	Traffic & Pedestrian Plan; Noise, Air Quality, Waste, Water Protection Plans; security protocols; community liaison	CRSEG Community Liaison Officer
Grievance Redress Mechanism (GRM)	Employment Rights Act; Labor Laws	ESPS 2; ESPS 10	Accessible channels (email, hotline, anonymous); confidentiality; timelines; SEA/SH-sensitive procedures; grievance log. GRM	HR Representative / Grievance Committee, Social personnel
SEA/SH & GBV Prevention	Employment Rights Act; Health Services Act	ESPS 2; ESPS 4; ESPS 9; ESPS 10	Zero tolerance policy; risk screening; survivor-centered response; community awareness sessions; subcontractor compliance, GRM	HR Representative / Supervisors, Social Personnel
Labor Influx	Employment Rights	ESPS 1; ESPS 2; ESPS 4;	Workforce baseline; peak	Project

LMP Section	Relevant Barbados Legislation	Applicable IDB ESPS	Key Compliance Measures	Responsible Party
Risk Management	Act; Health Services Act; Safety and Health at Work Act	ESPS 9; ESPS 10	deployment monitoring; worker-community interaction protocol; confidential SEA/SH channels; survivor referral directory; language access; subcontractor cascade; escalation triggers	Manager / HR / HSE / CRSEG Community Liaison
Roles & Responsibilities	Employment Rights Act; Labor Laws	ESPS 1; ESPS 2; ESPS 4	Clear accountability structure (Project Manager, HR, HSE, Community Liaison, Supervisors, Workers); subcontractor obligations	Project Manager
Monitoring & Reporting	Employment Rights Act; Health Services Act	ESPS 1; ESPS 2; ESPS 9; ESPS 10	Monthly audits; disaggregated data; grievance/incident tracking; adaptive management; annual review with BWA & PEU	Project Manager / HR / HSE / CRSEG Community Liaison

The Compliance Matrix Annex (Table 134) serves as a traceability tool that links each section of the Labor Management Plan to the relevant national legislation and IDB Environmental and Social Performance Standards. It demonstrates that CRSEG's commitments are not abstract but grounded in enforceable legal and institutional frameworks.

Each row of the matrix identifies:

- The LMP section: The thematic area of labor management (e.g., recruitment, welfare, OHS).
- Relevant Barbados legislation: The statutory obligations that govern labor rights, health and safety, and public health.
- Applicable IDB ESPS: The international standards that elevate compliance to global best practice.
- Key compliance measures: The specific actions CRSEG will take to meet both national and international requirements.
- Responsible party: The individual or role accountable for implementation, monitoring, and reporting.

This matrix provides reviewers with a clear line of sight from commitments in the LMP to the standards they are designed to meet. It also ensures that responsibilities are clearly assigned, preventing gaps in accountability. The matrix will be reviewed periodically to ensure that emerging environmental and social risks and any updated legal/ESPS requirements are incorporated.

For CRSEG, the matrix is a management tool: it serves as an internal audit, it allows supervisors and managers to quickly identify which standards apply to their area of responsibility, what measures must be implemented, and how compliance will be monitored. For the Supervision Firm and SCWRP PEU/BWA, the matrix is an audit tool: it provides evidence that the LMP is aligned with both national law and international standards, and that compliance can be verified through monitoring and reporting.

By integrating this Compliance Matrix Annex into the LMP, CRSEG demonstrates its commitment to transparency, accountability, and continuous improvement. It ensures that labor management measures are not only well-intentioned but also enforceable, traceable, and responsive to both worker and community needs.

Occupational health and safety performance is reported against the following indicators, in line with the Project Execution Unit's requirements under ESPS 2: the number of worker fatalities since the start of works (target zero); the number of lost-time injuries and the lost-time injury frequency rate per million hours worked; the number of grievances relating to labor and working conditions received in the reporting period and the number closed within the timeframes of the Grievance Redress Mechanism; the number of workers, differentiated by age, sex, nationality and qualification, for directly employed, subcontracted and primary supply workers; and the number of occupational health examinations completed on recruitment, periodically and on exit. These indicators are compiled monthly by the HSE Representative and the HR Representative and reported in the monthly progress report to the Project Execution Unit; labor risks in the primary supply chain will be assessed and reported in the first update of this plan.

8.4.7.9. Knowledge Transfer, Mentoring, and Technical Capacity Building

The LMP recognizes that the participation of Chinese nationals, Barbadian nationals, and local subcontractors creates an important opportunity for structured transfer of technical knowledge. This knowledge transfer is not expected to occur only through the hiring of local workers or subcontractors, but through planned workplace arrangements that provide time, space, supervision, and resources for mentoring, practical training, and joint problem-solving during construction and commissioning.

CRSEG will therefore use the LMP to support knowledge transfer by pairing experienced technical personnel, including Chinese national specialists where relevant, with Barbadian workers and subcontractor teams in areas such as water reclamation technology, sewage treatment plant construction, equipment installation, process control, quality assurance, commissioning, and maintenance readiness. These arrangements should be built into work planning, toolbox talks, task briefings, and supervisory routines so that local personnel are able to observe, practice, ask questions, and progressively assume greater responsibility for technical tasks.

This approach will require more than informal on-the-job exposure. The LMP will support dedicated mentoring and training spaces, including scheduled technical briefings, translated or interpreted instruction where needed, practical demonstrations, supervised work rotations, and joint inspections involving CRSEG specialists, local workers, and subcontractor supervisors. Where language or cultural differences may affect learning, supervisors will ensure that instructions are clear, respectful, and accessible, and that workers including female workers and workers with disabilities, are encouraged to raise questions without fear of embarrassment, retaliation, or discrimination.

Local subcontractors will be included in relevant technical learning opportunities so that capacity building extends beyond directly hired employees. Subcontractor contracts, induction requirements, and supervision arrangements should therefore identify where subcontractor personnel are expected to

participate in technical orientation, safety-critical training, quality control briefings, and lessons-learned sessions. This will help ensure that technical standards are consistently understood across the whole workforce and that local firms benefit from exposure to project methods and technologies.

Implementation will be monitored through the LMP's training and reporting system. CRSEG will track participation in technical training, mentoring assignments, refresher sessions, toolbox talks, and subcontractor capacity-building activities, with attention to nationality, role, gender, and employment category where appropriate. Feedback from workers and subcontractors will be systematically reviewed through supervision meetings, audits, and the worker grievance mechanism to identify and address barriers to learning, communication, or equal access to training. Disaggregated training data will be analyzed to detect gaps in participation or progression among women, youth, migrant workers, subcontractor staff, and other vulnerable groups. Where gaps are identified, targeted actions such as adjusted schedules, additional sessions, or tailored training approaches will be implemented to close them.

In this way, the LMP contributes not only to compliant labor management during construction but also to the longer-term development of local technical capacity and the sustainable operation of the completed facilities. By embedding continuous feedback and disaggregated monitoring into training and capacity-building processes, the Plan ensures that all workers, regardless of gender, age, nationality, or disability status, can participate meaningfully and benefit equitably from project opportunities.

8.4.8. Code of Conduct (CoC)

Introduction

This Code of Conduct (CoC) outlines the mandatory standards of behavior and ethics in labor, health, safety, environmental, human rights, anti-corruption and cultural respect required from all employees, subcontractors, and representatives of CRSEG. This CoC applies to all project-related activities, whether on or off the project site (a Chinese translated version of this CoC can be found here).

It defines the rules of behavior for all workers related to risks associated with, but not limited to: prevention and management measures for environmental, labor, and social risks of the project, including health and safety risks, third party contractor actions, labor influx, illicit behavior and crime, sexual and gender-based violence, discrimination, and sexual abuse and exploitation of children and other individuals or vulnerable groups such as Persons with Disabilities (PWDs) and sexual minority groups, namely LGBTIQ+.

This CoC aligns with the IDB's Environmental and Social Safeguards, specifically ESPS 1: Assessment and Management of Environmental and Social Risks and Impacts; ESPS 2: Labor and Working Conditions; ESPS 4: Community Health, Safety and Security; ESPS 9: Gender Equality and ESPS 10: Stakeholder Engagement. It is also supported by key plans such as the Social Management Plan, Gender Monitoring Plan, Grievance Redress Mechanism (GRM), Labor Management Plan (LMP), Workers' Health and Safety Plan, Emergency Response Plan, Incident Management Plan and the Community Health and Safety Plan.

The objective of the Code of Conduct is to maintain a safe, respectful, productive, and inclusive workplace and to promote harmonious relations with the local community and other stakeholders. Compliance with this Code is strictly mandatory and is a condition of employment.

This CoC outlines mandatory standards of behavior, ethics, and safety for all CRSEG employees, subcontractors, and representatives. It enforces a zero-tolerance policy for Sexual Harassment (SH), Sexual Exploitation and Abuse (SEA), and Gender-Based Violence (GBV), applying survivor-centered principles of confidentiality, informed consent, safety, dignity, and non-retaliation for complainants, victims and witnesses.

Recognizing the project's projected workforce profile (252 workers, predominantly male, with 120 non-local workers), the CoC integrates enhanced supervision, mandatory induction, language-appropriate training, and community-interaction protocols to mitigate labor influx risks, SH/SEA/GBV, discrimination and other social harms.

Community health risks, including traffic injury, vector-borne disease, wastewater exposure, and SEA/SH/GBV are treated as critical pathways. This Code aligns with the Community Health Plan to ensure worker conduct protects surrounding communities and minimizes social and gender-related harms.

All workers must complete mandatory health, safety, and environment (HSE) training, specialized safety modules, and induction on SH/SEA/GBV prevention, appropriate use of the grievance and reporting mechanism, and community health safeguards. Compliance with this CoC is a condition of employment and contracting, and a cornerstone of upholding non-discrimination, preventing SH/SEA/GBV, respect for community members and maintaining project integrity and community trust.

Non-compliance with this Code of Conduct will result in proportionate disciplinary measures, up to and including removal from site, termination of employment or contract and where the conduct may constitute a criminal offense, referral to the competent authorities in accordance with applicable law.

Purpose

CRSEG has prepared this CoC to regulate the behavior and actions of all employees, subcontractors, and representatives, and to prevent safety, health, social, and community risks caused by improper conduct.

The CoC integrates safeguards across environmental, labor, social, and gender-related domains, ensuring ethical behavior in labor practices, health and safety, human rights, working conditions, and community relations. It enforces a zero-tolerance policy for SH, SEA, and GBV, applying survivor-centered principles of confidentiality, informed consent, dignity, safety and non-retaliation, with access to referral services and grievance and reporting mechanisms.

Recognizing the risks associated with labor influx including a large, predominantly male and partly non-local workforce, the CoC establishes mandatory induction, language-appropriate training, worker-community interaction protocols, and enhanced supervision to mitigate SEA/SH/GBV risks.

The CoC also integrates community health safeguards, requiring workers to protect surrounding communities from traffic injury, vector-borne disease, wastewater exposure, and SEA/SH/GBV, consistent with the Community Health Plan and overseen by the Community Health Focal Point.

All workers must complete HSE training, specialized safety modules, and induction on SH/SEA/GBV prevention, appropriate use of grievance and reporting mechanisms, and community health safeguards, reinforced through refresher sessions, toolbox talks, and community engagement.

The CoC applies to all stages of the project, design, construction and operation, for both the Workers' Campsite, the *"Upgrading of the existing South Coast Sewage Treatment Plant (SCSTP)" and the "Construction of the New South Coast Water Reclamation and Re-use Facility (SCWRRF)"*. Non-compliance with this Code of Conduct will result in proportionate disciplinary measures, up to and including removal from site, termination of employment or contract and where the conduct may constitute a criminal offense, referral to the competent authorities in accordance with applicable law.

8.4.8.1. Responsibility (Management Oversight)

Project Manager

The Project Manager has ultimate accountability for the overall implementation of the CoC, including its social and gender-related provisions. This responsibility includes ensuring that all subcontractors formally adopt and enforce this document. The Project Manager must ensure that sufficient resources are allocated for welfare facilities, health and safety, training and awareness, and for ongoing communication and enforcement of this document with all relevant stakeholders.

It is also the responsibility of the Project Manager to manage incidents between workers and residents as well as between workers that concern the execution of all project-related activities. The Project Manager will also have oversight to manage the occurrence of any serious incident including SH/SEA/GBV incidents, while also being responsible for reporting and documenting such incidents in line with the GRM and survivor-centered protocols of confidentiality, informed consent, safety, dignity and non-retaliation. Reporting will be made to the Employer/the Project Execution Unit (PEU) and/or to other relevant authorities and stakeholders in accordance with the Grievance Redress Mechanism (Section 8.4.12), the SH/SEA/GBV Prevention and Response Plan (Section 8.4.9) and applicable law.

The Project Manager is also accountable for ensuring labor influx risk controls are implemented, including mandatory Code of Conduct signing, GBV/SEAH induction, and worker-community interaction protocols. They must verify that confidential reporting channels and referral pathways to appropriate services (medical, psychosocial, legal, safety/shelter, protection) are functional before workforce mobilization, and that subcontractors adhere to these requirements. Non-compliance by contractors, subcontractors, or workers must be addressed through corrective actions and proportionate disciplinary measures and where relevant referral to appropriate authorities.

The HR Representative is responsible, with support from the Project Manager, for ensuring that the Code of Conduct is clearly displayed through signage across the project site, including at the main entrance and other high-visibility areas, in languages that are understandable to all workers.

Human Resources (HR) Representative

The HR Representative is responsible for communicating, distributing, and monitoring compliance with the Code of Conduct. The HR Representative ensures every worker, and any other relevant stakeholders, receives a copy in their native language, signs the acknowledgment, and understands the Code's requirements and the available grievance and reporting processes.

In addition to managing grievances, the HR Representative must apply survivor-centered principles, confidentiality, informed consent, dignity, safety and non-retaliation, when handling SEA/SH/GBV cases. Such cases must be recorded only in restricted-access registers, separate from the general grievance log, and survivors are offered referral to medical, psychosocial, legal, or child protection services as

relevant. Further procedural requirements are set out in the Grievance Redress Mechanism (Section 8.4.12) and the SH/SEA/GBV Prevention and Response Plan (Section 8.4.9).

The HR Representative is responsible for ensuring the Code of Conduct is prominently posted at all work sites and common areas, in accessible formats and languages, and updated promptly whenever revisions occur. This responsibility will be supported by the Project Manager and CRSEG, as necessary, to guarantee visibility and compliance across all operations.

The HR Representative ensures grievance channels are accessible in English and Standard Chinese, with interpreters provided where necessary and safe, so that all workers can raise concerns without language barriers. The HR Representative reports anonymized case numbers, types of grievances, and resolution times on at least a quarterly basis to the Project Manager and PEU, ensuring transparency and oversight without compromising confidentiality or survivor safety. Additionally, if necessary, this person will be responsible for organizing a competent team to investigate sensitive cases, abuse of power, humiliation, bullying, gender-related complaints or allegations of harassment, ensuring a safe, unbiased process that is separate from standard management lines.

Further, any serious allegations such as SH/SEA/GBV, child abuse, or severe safety incidents must be immediately escalated to the designated persons, including the Project Manager, HR and/or the HSE Representative, and where necessary, to the relevant authorities. In such cases, the internal investigation process shall be managed in accordance with the Grievance Redress Mechanism (GRM) system and SH/SEA/GBV Prevention and Response Plan, ensuring that actions taken do not expose victims, complainants or witnesses to retaliation and follows the framework featured in Figure 73 below:

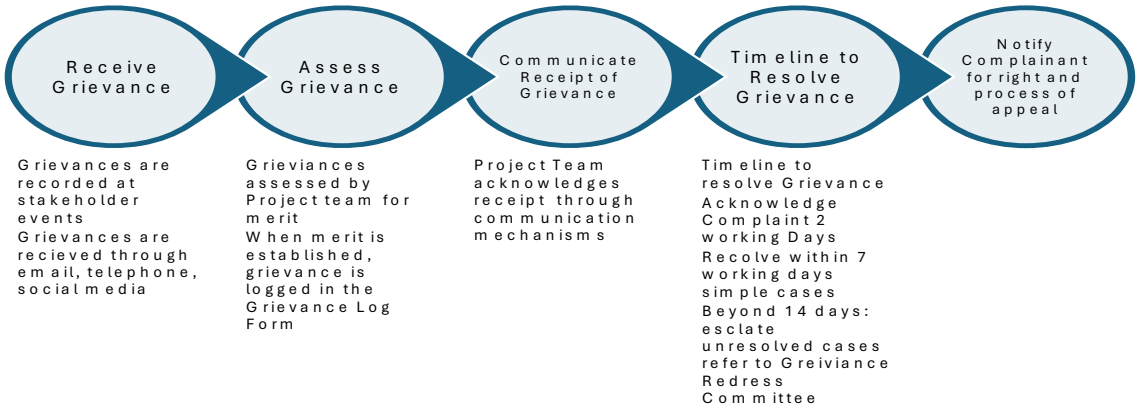


Figure 73: Grievance Mechanism Process

Field Enforcement and Daily Monitoring

Site Supervisors and Foremen

Positioned as the primary line of enforcement, Site Supervisors and Foremen are responsible for monitoring day-to-day interpersonal interactions, ensuring fair task distribution, intervening immediately in cases of bullying and/or any observed or reported inappropriate behavior, and verifying that their crew is operating in full compliance with the signed Code of Conduct. By this token, Site Supervisors and Foremen are responsible for reporting all suspected violations and will be protected from retaliation when they do so in good faith.

In addition to intervening in cases of bullying or misconduct, supervisors are required to escalate SEA/SH/GBV concerns immediately to the HR Representative or the HSE Representative, applying survivor-centered principles of confidentiality, safety, dignity and non-retaliation. They also play a supporting role in community engagement, reinforcing key awareness messages on SH/SEA/GBV, community health and respectful conduct during toolbox talks and daily briefings. By documenting conduct risks and reporting grievance trends, Site Supervisors and Foremen contribute directly to the project's monitoring and accountability framework and to the early identification and mitigation of social and gender-related risks.

Health, Safety, and Environmental (HSE) Representative

The Health, Safety, and Environmental (HSE) Representative plays a pivotal role in ensuring that all project activities are conducted in strict compliance with health, safety, environmental and related social standards. Beyond enforcing the commitments outlined in the CoC, the HSE Representative is tasked with supervising specialized safety training for high-risk operations such as confined space entry, hot work, lifting, electrical works, and working at height. They ensure that workers are properly certified before engaging in these activities and that refresher training is delivered regularly. This responsibility extends to monitoring occupational health risks and ensuring that personal protective equipment (PPE) is used consistently and correctly across all work areas.

In addition to workplace safety, the HSE Representative is responsible for monitoring community health pathways identified in the Community Health Assessment. These include traffic safety risks, vector-borne disease exposure, wastewater hazards, and the potential for SEA/SH/GBV incidents linked to worker presence and movement in surrounding communities. Where urgent risks arise such as hazardous spills, wastewater releases, traffic near misses, or suspected outbreaks, or serious SH/SEA/GBV concerns, the HSE Representative must escalate the matter without delay (within 48 hours) to the Community Health Focal Point, the Project Manager and the PEU. This ensures that corrective action is taken swiftly and transparently, protecting both workers and the wider community. Related procedures are supported by the Community Health Plan and the SH/SEA/GBV Prevention and Response Plan (Section 8.4.9).

As such, the management of HSE matters will be conducted in accordance with the project's HSE supporting documents featured in the *Environmental and Social Impact Assessment (ESIA)* and *Environmental and Social Management Plan (ESMP) for the Workers' Camp, in the ESIA/ESMP for "Upgrading of the existing South Coast Sewage Treatment Plant (SCSTP)" and for the "Construction of the New South Coast Water Reclamation and Re-use Facility (SCWRRF)"*. Those plans include, inter alia, the Health, Safety and Environment (HSE) Management Plan, the Emergency Preparedness and Spill Response Plan, the Incident Management Plan and the Community Health Plan, supported by the Contractor's HSE Management Manual (Rev. 2, August 2026), which is annexed to this ESIA/ESMP.

Specialty Oversight and Community Relations

Community Liaison Officer (CLO)

The position and responsibilities of the CLO and Community Focal Point(s) must first be confirmed and agreed by the BWA. Only once this has been formalized may the contractor define and implement the detailed duties of the CLO within its own roles and responsibilities framework. Where subcontractors require support from BWA-assigned CLOs, CRSEG shall submit a formal request to the PEU. Subject to BWA approval and assignment, the CLO(s) will work closely with the PEU through the Communications Officer and the Social/Gender Specialist, in accordance with the mandate and coordination arrangements communicated by the PEU.

The Community Liaison Officer functions as a dedicated focal person with responsibility for oversight, coordination, and quality assurance of community engagement activities. Unlike the Community Focal Point, who manages day-to-day interactions, the CLO provides a higher-level interface between the project, the BWA, and the PEU. The CLO ensures that grievances and feedback collected by Community Focal Points are properly escalated, tracked, and addressed in accordance with the Grievance Redress Mechanism (GRM).

This role includes monitoring the performance of Community Focal Points, offering guidance and training, and ensuring that engagement activities are consistent with the Stakeholder Engagement Plan (SEP). The CLO liaises closely with the PEU Communications Officer and Social/Gender Specialist to integrate community perspectives into project decision-making and safeguard inclusivity. In cases involving Sexual Exploitation, Abuse, or Harassment (SEA/SH/GBV), the CLO upholds strict confidentiality protocols and ensures that survivors are offered information and referral to appropriate medical, psychosocial, legal, and protection services, following a survivor-centered approach.

By serving as the formal bridge between community engagement structures and project governance, the CLO strengthens accountability, ensures transparency, and supports the project's social license to operate.

Community Focal Point

The Community Focal Point serves as the frontline representative for community engagement, acting as the immediate and accessible contact for residents and stakeholders. This role is responsible for receiving and documenting grievances, ensuring that reporting channels are inclusive and accessible to vulnerable groups such as women, youth, older persons, and persons with disabilities. The Community Focal Point disseminates project information in plain, culturally appropriate language, supports awareness of the grievance mechanism, and coordinates referrals for community health or social concerns when needed. In addition, the Focal Point maintains updated stakeholder records and ensures that community feedback is promptly reported to the CLO and the PEU for escalation and resolution. By serving as the first point of contact, the Community Focal Point helps build trust, ensures transparency, and strengthens the link between the project and the communities it affects.

8.4.8.2. Individual Employee Responsibility

Enforcement of the CoC ultimately relies on the individual compliance of each employee, subcontractor, and other users of this document. Everyone is responsible for their own conduct, for maintaining a respectful and inclusive workplace, for following labor ethics and appropriate behavior, for not

compromising safety, and for committing to the human dignity of all persons involved, regardless of age, gender, nationality, disability or any other status.

Notably, the CoC is intended not only to establish expected standards of behavior but also to protect the rights, dignity, health, safety, and well-being of all workers throughout the project. It affirms every worker's right to raise concerns or report incidents affecting their physical, psychological, or sexual safety without fear of intimidation, discrimination, or retaliation. The CoC further safeguards workers' right to access and use the Project's GRM to seek resolution of workplace concerns in a fair, confidential, and timely manner with specific safeguards for SH/SEA/GBV-related reports. At the same time, all workers are expected to uphold the principles of the CoC by treating others with respect, avoiding harassment and discrimination, complying with project requirements, and acting in a manner that protects both their own rights and the rights of their colleagues and community members. Non-compliance with these responsibilities may result in corrective and disciplinary measures in line with project procedures and applicable laws.

Table 136 provides a summary of the roles and responsibilities outlined in this section.

Table* 136*: Summary of CoC Roles and Responsibilities

Role	Key Responsibilities
Project Manager	Ultimate accountability for CoC implementation; ensures subcontractor adoption; approves official project communication with advice, recommendations and support from the PEU, allocates resources for welfare, training, and safety; manages incidents and reports to PEU and authorities; verifies labor influx controls, Code signing, signage, induction completion, and functional confidential reporting channels.
HR Representative	Communicates and distributes the CoC; ensures there is signage on the CoC available throughout the site, manages confidential grievance channels; applies survivor-centered principles in SEA/SH/GBV cases (confidentiality, consent, dignity, non-retaliation); maintains restricted records separate from general grievances; ensures worker communications are accessible, inclusive and in plain language; ensures language access (English/Chinese); coordinates referrals to medical, psychosocial, legal, and child protection services; reports anonymized case data quarterly.
HSE Representative	Enforces health, safety, and environmental commitments; provides technical verification of health, safety, and environmental information before release; supervises specialized safety training (confined space, hot work, lifting, electrical, working at height, others); monitors occupational and community health pathways (traffic, vector control, wastewater, SEA/SH/GBV); ensures accuracy of safety alerts and compliance notices; escalates urgent risks within 48 hours to Community Health Focal Point and PEU; halts unsafe operations and issues sanctions.
Site Supervisors & Foremen	First line of enforcement; monitor daily worker behavior; intervene in bullying or misconduct; ensure crews comply with the CoC; verify Code signing and GBV/SEAH induction completion before site access; enforce worker-community interaction protocols; escalate SEA/SH/GBV concerns immediately to HR/HSE; reinforce awareness messages during toolbox talks; document conduct risks and report grievance trends.
Community Liaison Officer	Acts as bridge between project and community; facilitates two-way communication; manages community grievances confidentially; conducts awareness sessions on prohibited conduct, grievance channels, and referral services; ensures inclusion of

Role	Key Responsibilities
	vulnerable groups (women, children, PWDs, migrants); coordinates with HR/HSE on SEA/SH/GBV cases; monitors community health concerns (noise, traffic, sanitation, vector control); reports grievance trends quarterly to Project Manager and PEU.
Community Focal Point(s)	Manages interim engagement with communities via PEU; facilitates culturally appropriate communication and grievance awareness sessions.
Individual Employees	Personal responsibility for respectful conduct; complete mandatory HSE and GBV/SEAH training; comply with safety and community health safeguards; report violations without fear of retaliation; uphold dignity and human rights of colleagues and community members.

8.4.8.3. Stakeholder Engagement, Public Relations and Communications

CRSEG, or its subcontractors, shall manage stakeholder engagement and external communications in coordination with the PEU and in accordance with arrangements approved by the BWA. CRSEG or its subcontractors shall designate in writing a suitably qualified Community and Stakeholder Engagement Focal Point Person(s), together with an alternate, to coordinate implementation. Only persons formally authorized by the PEU and/or BWA may issue official public statements, provide media interviews, or communicate official project positions. CRSEG, its subcontractors, and their personnel shall not make commitments on behalf of BWA, the PEU, or IDB without written authorization.

Engagement Requirements

Stakeholder engagement shall be timely, meaningful, two-way, culturally appropriate, inclusive, non-discriminatory, and free from intimidation or retaliation. Information shall be provided sufficiently early and in sufficient detail to allow affected stakeholders to understand relevant project activities and impacts, ask questions, raise concerns, provide feedback, and contribute to decisions that may affect them.

Inclusive and Accessible Communication

Targeted, separate, or supported engagement shall be provided where necessary to facilitate the effective participation of groups that may face barriers to participation, including women, persons with disabilities, older persons, young people through appropriate representatives, migrants, low-income households, and other vulnerable or marginalized groups. Communications shall use plain and understandable language and channels appropriate to the stakeholder group, which may include direct notices, letters, telephone, email, community meetings, notice boards, signage, radio, official digital platforms, and recognized community institutions. Where required, accessible formats shall be provided, including large print, accessible electronic text, audio, interpretation, sign-language support, and appropriate non-digital alternatives.

Confidentiality and Data Protection

Personal information and sensitive stakeholder or grievance information shall be protected in accordance with the Barbados Data Protection Act, 2019 and the confidentiality requirements of the project's Grievance Redress Mechanism. Special provisions shall apply to SEA/SH/GBV cases, ensuring

survivor-centered handling, limited disclosure, and restricted record-keeping in secure files separate from general grievances.

Social Media, Photography and Public Communications

Social Media Conduct

Workers are strictly prohibited from posting confidential, security-sensitive, personal, grievance-related, or unverified project information on social media or other public platforms. Workers shall not engage in online arguments or hostile exchanges with community members, stakeholders, or the public. All online activities must comply with project confidentiality, respect for community relations, and professional standards.

Consent and Authorization

Any project-related photography, filming, interviews, audio recordings, drone footage, or images of community members, children, complainants, victims, or private property shall only be undertaken with prior authorization from the Project Manager or PEU and with the informed consent of the individuals concerned. Consent must be documented and, where applicable, parental or guardian consent must be obtained for minors.

Compliance

Unauthorized disclosure, posting, or recording constitutes a breach of this Code of Conduct and may result in disciplinary action, including termination.

Commitments

This Code of Conduct outlines the rules of behavior for all employees, subcontractors, and representatives of CRSEG, related to risks associated with, but not limited to, prevention and management measures of environmental, labor, social, and gender-based risks of the Project. This includes labor ethics, human rights, health and safety risks, third-party contractor actions, labor influx, illicit behavior and crime, sexual and gender-based violence, discrimination, and sexual abuse, harassment, and exploitation of persons, regardless of age, gender and ability. All commitments are as follows:

Courtesy and Respect: all employees, subcontractors, and representatives of CRSEG must conduct themselves in a manner that is lawful, courteous, businesslike, and respectful of all staff, guests, or visitors. Workers must also respect cultural norms and community sensitivities, particularly when interacting with vulnerable groups such as women, children, persons with disabilities, and migrants.

Language and Behavior*:* all employees, subcontractors, and representatives of CRSEG cannot engage in behavior that is rude, threatening, or offensive. Use of profane or insulting language is prohibited. Harassment of any type, including sexual harassment, is strictly prohibited. Abusive, derogatory, obscene, or improper language, gestures, remarks, whistling, cat calls, or other disrespectful behavior will not be tolerated. Roughhousing, fighting, fisticuffs, physical threats, destruction of property, vandalism, littering, or physical abuse of anyone on the campsite and worksites throughout the project construction and operation is not permitted under any circumstances.

No Weapons, Alcohol, or Drugs: The use, possession, distribution, or sale of any weapon, alcohol, illegal drugs, or controlled dangerous substances by any contractor, contractor's employee, or

employee's representative is prohibited while on duty or on-site during project construction and operation, and/or at the Workers' Campsite. Offenders will be removed and reported to the local Police Department.

Reporting: All employees, subcontractors, and representatives of CRSEG are required to report any matter involving a violation of these rules of conduct to the Project Manager or appropriate Representative. Likewise, any matter involving abuse of power, humiliation, bullying, gender-specific harassment, health or safety, including any altercations, should be reported to the Site Supervisor/Foreman or appropriate Representative. CRSEG is committed to non-retaliation against any employee, subcontractor, visitor, community resident, and/or victims who report violations of this CoC.

Child/ Children: No person under the age of 18 years will be employed by CRSEG. Child Labor is strictly prohibited. CRSEG shall ensure the protection of children (including prohibitions against sexual activity or abuse, or otherwise unacceptable behavior toward children, limiting interactions with children, and ensuring their safety in project areas), as prescribed in Labor Laws Chapter 346, L.R.O 1979, the Labor Laws of Barbados. Any allegation of child abuse or exploitation will be escalated immediately to HR/HSE and PEU and referred to child protection authorities.

Health and Safety Requirements: All employees, subcontractors, and representatives of CRSEG shall ensure compliance with applicable health and safety requirements to protect the local community, the Employer's Personnel, and the Contractor's Personnel. Applicable plans to be followed include the Health, Safety and Environment (HSE) Management Plan, the Emergency Preparedness and Spill Response Plan, the Incident Management Plan and the Community Health Plan, as listed in the ESMP section of this document, further supported by the Safety Education and Training Plan and the Contractor's HSE Management Manual (Rev. 2, August 2026, annexed). Additionally, in accordance with the Safety and Health at Work Act, Cap. 356, workers have the right to refuse to work in unsafe conditions without fear of reprisal. All workers must complete HSE training, specialized safety modules, and refresher sessions.

Non-Discrimination: CRSEG and their Employees shall ensure non-discrimination in interactions with the local community (including vulnerable and disadvantaged groups), by the Contractor's Personnel, and subcontractors (for example based on family status, ethnicity, race, gender, religion, language, marital status, age, disability (physical and mental), sexual orientation, gender identity, political conviction or social, civic, or health status). Additionally, the Contractor commits to providing equal opportunities for all persons throughout the project and reasonable accommodation for all persons dwelling and/or using the facilities of the camp. Equal opportunities must be extended to subcontractor and supplier personnel, with reasonable accommodation for vulnerable groups.

Sexual Harassment: Sexual harassment is strictly prohibited. For example, it is strictly prohibited to use language or behavior toward men, LGBTIQ+ persons, women and/or children that is inappropriate, harassing, abusive, sexually provocative, demeaning, and/or culturally inappropriate. CRSEG enforces a zero-tolerance policy for SH/SEA/GBV. All responses to SH/SEA/GBV concerns must be guided by Survivor-centered principles of confidentiality, consent, dignity, safety, and non-retaliation. Workers are prohibited from engaging in exploitative relationships including those involving unequal power dynamics, or the exchange of money, goods, services, or employment opportunities for sexual or personal favors. Such conduct is strictly forbidden as it undermines safeguarding standards, reinforces harmful social and gender power imbalances, creates risks of abuse, and violates this Code of Conduct.

Any alleged breach will be taken seriously, promptly assessed, and substantiated violations will result in proportionate disciplinary action, up to and including termination of employment/contract and where relevant referral to the appropriate authorities in line with national legislation.

Sexual and/or Gender-Based Violence: All employees, subcontractors, and representatives of CRSEG shall ensure that violence, including sexual and/or gender-based violence, does not permeate the Camp or in any project-related activity. Such behavior is prohibited, and a zero tolerance will be maintained. Such forbidden behavior includes but is not limited to acts that inflict physical, mental, or sexual harm or suffering, threats of such acts, coercion, and deprivation of liberty at the project site, at the workers camp, during transport or in surrounding communities.

Exploitation, including Sexual Exploitation and Abuse: There shall be no exploitation, of any kind, including sexual exploitation and abuse. This includes, for example any exchange or offer of exchange of money, employment, goods, or services for sex, including sexual favors or other forms of humiliating, degrading or, exploitative behavior, or any abuse of power between employees or community members. The purchase or solicitation of sexual services is prohibited, on or off duty, at the camp, at the project sites and in the surrounding communities, including St. Lawrence Gap. And sexual activity with a child (under the age of 18 years) is strictly prohibited, regardless of local age of consent or mistaken belief about age.

Welfare facilities: CRSEG shall ensure that adequate welfare facilities are provided and maintained (for example, ensure workers use only the specified sanitary facilities provided by their employer and not open areas). CRSEG will provide and maintain gender-segregated sanitary facilities that are safe, well-lit, accessible to women, LGBTIQ+ persons, persons with disabilities and that these facilities are clean and sanitary at all times. Regular inspections will be conducted to ensure compliance with health and safety, ensuring dignity, and privacy for all workers, particularly women and other vulnerable groups.

Non-retaliation: CRSEG and all its employees, subcontractors, and representatives shall ensure that no retaliation is taken against workers, community members, and/or other stakeholders who report suspected or actual violations of this Code, or who participate in investigations, provided such reports are made in good faith. Protection extends to workers, community members, complainants, witnesses, and support persons. Any form of intimidation, harassment or retaliation is strictly prohibited and will result in disciplinary action, termination of employment or contract, and where appropriate referral to the relevant authorities.

8.4.8.4. Compliance with Laws and Regulations

As an Operator in Barbados, CRSEG will act and operate within the confines of the national laws and regulations to ensure a duty of care for all employees, the affected communities, and the environment. Therefore, all the commitments outlined in this Code of Conduct mandate CRSEG and all signatories to comply with all applicable Barbadian laws, regulations, and standards pertaining to construction, labor and employment practices, sexual harassment, sexual exploitation and abuse, gender equality and human rights, environmental protection, and occupational health and safety. This includes but is not limited to:

Construction Laws: Understanding and adhering to the building laws and any other relevant legislation governing construction activities in Barbados.

Labor Practices: Ensuring compliance with Labor laws regarding wages, working hours, employment conditions, and worker rights as specified under the relevant Labor Legislation, Employment Rights Act -2012.

Environmental Regulations: Adhering to the laws, policies, and regulations of the Environmental Protection Department (EPD) to minimize the project's impact on the environment and promote sustainable practices.

Health and Safety: Implementing and enforcing safety measures to protect workers, stakeholders, and the public from hazards associated with construction activities in keeping with the Health Services Act, CAP. 44.

Gender Equality: Promoting and enforcing equal treatment of all workers and stakeholders, ensuring workplaces are free from discrimination, harassment, and exploitation, in keeping with the Sexual Harassment (Prevention) Act, national legislation and policies on gender equality, non-discrimination, and the protection of vulnerable groups, as well as international conventions such as the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW) and other institutional safeguards.

Data Protection: Protecting the privacy and personal information of workers' complaints and personal information according to the Data Protection Act (DPA) 2019 of Barbados.

Integrity and Ethical Conduct

Honesty and Transparency: CRSEG, and all its employees, subcontractors, and representatives shall conduct all professional activities with honesty, integrity, and transparency. Provide accurate and truthful information to the Employer, Contractor, Subcontractors, and other Stakeholders at all times, including when reporting project progress or incidents or issues. Employees shall present information objectively without omitting relevant details or providing misleading, false or doctored information.

Conflicts of Interest: All employees, subcontractors, and representatives of CRSEG shall avoid conflicts of interest that may compromise, or appear to compromise their professional judgment or impartiality, for example, awarding subcontracts to relatives, or close associates, holding financial interests in suppliers or competitors, and any such types of actions recognized as unscrupulous transactions. Such parties shall disclose any actual or potential conflicts of interest promptly to the appropriate manager or stakeholders and seek guidance on how to manage or mitigate them.

Anti-corruption: All employees, subcontractors, and representatives of CRSEG shall refrain from offering, soliciting, or accepting bribes, kickbacks, or any other form of improper advantage. Uphold a zero-tolerance policy toward corruption and report any suspected or observed instances of corruption to the relevant authorities. Decline any offers of gifts or favors from subcontractors or suppliers that could influence their decision-making process or create a conflict of interest. Employees are to decline any offers of gifts, hospitality, or favors from subcontractors or suppliers that could influence the decision-making process or create a conflict of interest. As a general rule, all gifts must be given openly, not hidden, and must be properly documented in the project’s expense or gift registers. Hospitality (such as business meals) must have a legitimate, bona fide business purpose and occur in the normal course of standard business practice.

Giving anything of value to government officials, public servants, or employees of state-owned enterprises is strictly prohibited. Offering directly or indirectly any gifts of any value to influence the actions of another party is strictly prohibited. Low-value, infrequent gifts, despite not being intended to influence project decisions, must be recorded. Notwithstanding this, workers are permitted to accept gifts of modest value. These include branded promotional materials for information purposes. All employees and actions of the project are subject to the following laws of Barbados, including the Prevention of Corruption Act, Anti-Corruption and Anti-Terrorism Agency Act, and the Whistleblower Protection Act.

Professionalism

Competence: All employees of China Railway Shanghai Engineering Group Co., Ltd. shall maintain a high level of competence and proficiency in their field of supervision. Stay informed about industry best practices, technological advancements, and relevant regulatory policy changes through continuous learning and professional development activities. When asked, they must attend seminars, workshops, and training sessions on construction management, quality assurance, and project supervision to enhance their skills and knowledge of current happenings in society and industry. The cost for all work-related, recommended training(s), inclusive of associated costs, will be incurred by the CRSEG, unless otherwise advised by relevant stakeholders. Additionally, when various training programs are outlined, the Contractor will share the information on the training structure and competency of the trainer with the PEU prior to the training exercise.

Respect and Collaboration: CRSEG, and all its employees, subcontractors, and representatives are expected to treat all individuals with respect, fairness, and dignity, regardless of their gender, age, nationality, sexual orientation, disability, role or position within the project. Foster a collaborative and inclusive work environment that values diversity, prohibits harassment and discrimination and promotes teamwork. Listen actively to the perspectives and concerns of all project stakeholders, including subcontractors, workers, and community members, particularly women, youth, persons with disabilities, migrants and other vulnerable groups, to facilitate constructive dialogue and problem-solving.

Professional Image: An image of professionalism and demeanor must be maintained in all interactions related to the project. Dress appropriately for the work environment and maintain a courteous and respectful attitude in communications and meetings. Communicate clearly and professionally in written correspondence, emails, and reports to convey information effectively and maintain professional standards.

Compliance

The Contractor's personnel shall:

General Conduct:

- Employees must comply fully with this Code of Conduct and all applicable organizational policies including those on SH/SEA/GBV prevention, non-discrimination, health and safety and environmental protection.
- Duties shall be carried out competently, diligently, and in a professional manner at all times.

- All individuals in the workplace and local community must be treated with dignity and respect, regardless of position, nationality, race, gender, age, religion, language, sexual orientation, political affiliation, disability, or any other protected characteristic. Harassment, bullying, discrimination and any form of SH/SEA/GBV are strictly prohibited.
- Honesty and truthfulness are required in all professional and community dealings, including when reporting incidents, near-misses or grievances.
- Noise levels must be kept to a minimum, particularly during early morning and late evening hours, to avoid disturbing the local community and to respect vulnerable groups such as children, older persons, and persons with disabilities.
- Workers must maintain hygiene and sanitation standards in living quarters and shared facilities. Proper waste disposal and respect for communal spaces are mandatory. Harassment in or around sanitation, washroom, and changing facilities is strictly prohibited. Separate, secure facilities for female workers must be respected at all times.
- Employees must immediately remove themselves from any situation that presents an imminent danger to their life or health and report the hazard to the project Manager or HSE Representative without delay.
- Workers must minimize health and safety risks to surrounding communities, including dust, noise, traffic hazards, and communicable disease transmission. Disregard for community health safeguards is a violation of the Code.
- Employees must comply with all applicable national laws, regulations, and community rules governing their conduct and operations, including to those related to sexual harassment, GBV, child protection and human rights. Where uncertainty arises regarding compliance obligations, employees are required to seek clarification from their supervisor and/or the designated Contractor's Representative.

Personal Security:

- Employees must take reasonable precautions to ensure their personal safety, including maintaining awareness of their surroundings and avoiding isolated or high-risk areas.
- In the event of accidents, threats, or other emergencies, employees are required to follow the established *Emergency Response Plan* without delay.
- All security measures must be observed at all times, including the proper display of identification badges and strict adherence to access restrictions.
- Workers are required to follow emergency procedures, including fire drills, evacuation routes, and crisis response instructions. Obstructing or ignoring emergency protocols will be treated as a serious violation.

Occupational Health and Safety:

- It is the Contractor's responsibility to ensure that workplace machinery, equipment, and systems of work are safe and without risks to health. Employees, in turn, have to follow established contractor's health and safety procedures and instructions for each duty or task to

develop, taking reasonable care of their own health and safety and of others. The use of machinery and equipment must be responsible in accordance with training and instructions provided. Employees must report any unsafe conditions or practices immediately to their supervisor or the HSE Representative to prevent harm.

- Required Personal Protective Equipment (PPE) must be worn at all times in accordance with health and safety regulations.
- Employees must follow the Health, Safety and Environment (HSE) Management Plan, where appropriate measures are described for handling chemicals, physical, biological, or other dangerous substances and agents, as also for specifics works, like work in heights among others specific works.
- Employees must adhere to the zero-alcohol policy during work activities and refrain from the use of narcotics or any substances that impair faculties.
- It is strictly forbidden to carry weapons, consume alcoholic beverages or drugs, smoke or vape, or possess pornographic images or objects within all areas of the job site and the community.
- Employees must follow all applicable emergency operating procedures promptly and without deviation.

Workplace and Community Behavior:

- Employees must refrain from any behavior that could escalate tensions or provoke conflict.
- All women, men, persons with disabilities (PWDs), older persons, youth, low-income persons, migrants, LGBTIQ+ persons and persons belonging to other marginalized groups (inclusive of those belonging to multiple groups) in the workplace must be treated with dignity and respect.
- All women, men, children, PWDs, older persons, youth, low-income persons, migrants, LGBTIQ+ persons and persons belonging to other marginalized groups (inclusive of those belonging multiple groups) in the local community must be treated with dignity and respect.
- Employees must avoid inappropriate language, harassing, abusive, sexually provocative, demeaning, or culturally offensive language toward women, men, children, PWDs, or LGBTIQ+ persons.
- Any form of harassment is strictly prohibited, including unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual or non-sexual nature.
- The Contractor has a responsibility to provide effective supervision, reporting mechanisms, and safeguarding systems to protect children from harm in all project activities and surrounding project areas. Employees, subcontractors, and representatives of CRSEG must follow established safeguarding policies and this CoC, take reasonable care in their interactions with children, and immediately report any suspicion or knowledge of abuse, exploitation, or unacceptable behavior. All personnel are required to refrain from any conduct that could harm or put children at risk, whether on or off duty. Allegations of child abuse or exploitation will be escalated immediately to HR and the HSE Representative and referred to the appropriate child protection authorities in accordance with the Labor Laws of Barbados and the project's Grievance Redress Mechanism.

- Exploitation of any kind is prohibited, including abuse of position, power, or trust for sexual or non-sexual purposes, whether for monetary, social, or political gain.
- Employees must not engage in any form of abuse, including sexual abuse and exploitation, involving physical intrusion, coercion, sexual favors, or humiliation.
- Sexual interactions or relationships between employees, subcontractors, or representatives of CRSEG and members of the local community, including project beneficiaries, are strictly prohibited under this Code of Conduct. Any exchange of money, employment, goods, or services for sex, or any behavior that could be construed as exploitative, coercive, or abusive, is expressly forbidden and will result in disciplinary action, including termination and referral to the appropriate authorities.
- Sexual activity with individuals under the age of 18 is strictly forbidden, including grooming or digital contact. A mistaken belief as to age or child consent is not a defense. Violations will be referred to the Barbadian Police Authorities for enforcement under the full extent of the law.

Reporting of Violations and Incidents:

- Report of violations of this Code in the workplace and in the local community can be done through the following ways:
    a. Contact the Supervisor and/ or HSE Representative regarding health, safety, and security situations.
    b. Contact the HR Representative about any interpersonal conflicts, bullying, targeted unfair treatment, and/or violation of workers' rights.
    c. Contact security personnel for reporting personal security incidents.
    d. Contact the Community Liaison Officer regarding all types of concerns, especially reporting on gender and sex-related incidents.
    e. Use the Grievance Mechanism for reporting of all types of complaints.
- Do not retaliate against any person who reports violations of this Code of Conduct.

Note: The person's identity will be kept confidential unless the country's law mandates reporting of allegations. Anonymous complaints or allegations may also be submitted and will be given all due and appropriate consideration. Any violation of this Code of Conduct by Workers will result in serious consequences, including termination and possible referral to legal authorities.

Training:

- Employees must complete relevant training courses that will be provided related to the environmental and social aspects of the project, including Health, Safety and Personal Security, Sexual Exploitation and Abuse, Sexual Harassment, Gender Based Violence, and use of the Grievance Mechanism. Training will also include introductory sessions on this CoC, conducted in languages understood by the Contractor's personnel and Employer's personnel, and delivered prior to the start of construction. In addition, periodic refresher sessions will be held throughout the life of the project to reinforce awareness of the CoC and the GRM. These requirements are further detailed in the Safety Education and Training Plan, with grievance-related training linked to Section 8.4.12 and

SH/SEA/GBV training linked to Section 8.4.9. Regular training on HSE matters will be done according to a specific HSE training schedule and matrix based on the applicability to the employee's position and role. Additionally, daily Toolbox Talks will be held before work sessions.

Confidentiality:

- Safeguard confidential and proprietary information obtained during the course of your work duties. Use this information solely for authorized purposes related to the project and refrain from disclosing it to unauthorized individuals or third parties. Protect sensitive project data, such as financial records, design specifications, and strategic plans, from unauthorized access or disclosure by implementing secure document management practices.

Accountability:

Code Adherence: Adhere to this Code of Conduct and uphold its principles, standards, and guidelines in all aspects of your work. Demonstrate personal accountability for your actions, decisions, and conduct throughout the project lifecycle. Review and acknowledge your understanding of the Code of Conduct annually or upon contract renewal to reaffirm your commitment to ethical behavior, professionalism, and compliance with legal and regulatory requirements.

Documentation and Audit:

CRSEG will maintain comprehensive documentation and records by following applicable Standard Operating Procedures (SOPs), Work Instructions, and other specific CRSEG Guidelines to demonstrate compliance with contractual obligations, regulatory requirements, and industry standards. Prepare documentation packages containing project plans, specifications, permits, inspection reports, and correspondence with stakeholders for audit purposes to validate compliance with quality, safety, and environmental standards.

Enforcement

Disciplinary Action: Violations of this Code of Conduct may result in disciplinary actions, up to and including termination of contract or employment, depending on the severity and impact of the misconduct.

CRSEG will employ a warning system for misconduct, not limited to failure to comply with health and safety guidelines, insubordination, illegal possession and use of alcohol, drugs, unlawful possession of firearms, and fighting. In keeping with standard employment systems, the Human Resources Officer will develop and implement a sanctions policy that guides the degree of disciplinary measures applied to various indiscretions. This policy will be formally documented within the Labor Management Plan (LMP) and cross-referenced in the GRM to ensure consistency and transparency. Workers will be informed of the policy during induction and refresher sessions on the CoC and GRM, and copies will be made available in languages understood by Contractor and Employer personnel. Sanctions could include, but are not limited to:

- *Verbal Warning:* A documented, informal conversation to notify the employee of the issue and outline clear expectations for improvement.
- *Written Warning:* A formal document placed in the employee's file detailing the infraction, required improvements, and the consequences of continued failure.

- *Performance Improvement Plan (PIP):* A structured, time-bound plan (usually 30 to 90 days) designed to help the employee correct specific performance gaps.
- *Final Written Warning:* The last step before termination, warning that failure to immediately correct behavior will result in job loss.
- *Suspension or Termination:* Temporary removal from duties (with or without pay) for investigation, or the severance of employment.

Further, the decision to impose disciplinary measures will be made in accordance with contractual agreements, legal obligations, and organizational policies. CRSEG will take disciplinary actions against staff in keeping with the Employment Rights Act, 2012, and the Severance Payment Act (Chapter 355 A) of Barbados.

Stop-work Orders may be issued on an as-needed basis where activities, behavior, or site conditions are determined to pose an unacceptable risk to the health and safety of workers or the public, the environment, project assets, or where there is non-compliance with applicable legal, contractual, or project requirements. The authority to issue a work order rests with the Engineer and, where applicable, the Supervising Consultant, Project Employer/PEU, or Funding Agency, in accordance with their respective roles and contractual obligations.

Therefore, procedures, responsibilities, conditions for lifting a *Stop-Work Order*, and any associated enforcement measures will be detailed in relevant project governance, contractual, or management documents and not in this CoC. These documents will be communicated to the appropriate stakeholders as necessary to ensure a clear understanding of the *Stop-Work* process and the requirements for resuming work.

8.4.8.5. Response to Breaches by China Railway Shanghai Engineering Group Co., Ltd.

All employees, subcontractors, and representatives of CRSEG are expected to adhere to the commitments and guidelines outlined in the previous sections. For daily activities, the following safety precautions must be adhered to:

- All employees must wear Personal Protective Equipment (PPE), like hard hats, security vests, shirts with long sleeves, steel toe shoes among others (safety glasses, hearing protection, respiratory protector, gloves, pants with safety tape, contractor identification). PPE is essential for preventing any incident or emergency, mainly if there is a potential risk.
- Erect barricades, signs, cones, delineating devices, other channeling devices, according to manual on uniform traffic control devices (MUTCD) Standards, flashing beacons, and floodlights.

Additionally,

- CRSEG will establish and implement a fall prevention program and *Work-at-Height* protocols to protect workers from such hazards by adhering to local safety regulations and international best practice standards, for example, Chapter 356 Safety at Work Act and OSHA Standards.
- CRSEG will train all employees to recognize the hazards associated with the type of job being undertaken including social and gender-related risks where relevant. Training records would also be maintained and readily available for inspection.

- Training records, including attendance information, will be disaggregated and reported to the Employer/PEU. It will specify the frequency (induction vs. refreshers) and any specialized training for key roles. These documents will be readily available for inspection, as stipulated by the Labor Laws of Barbados.

Acknowledgment

All employees, subcontractors, and representatives of CRSEG are required to read, understand, sign, and adhere to this Code of Conduct. By signing this document, you agree to adhere to this Code of Conduct and understand that any violation of these guidelines may result in disciplinary action, including termination of employment in accordance with the laws of Barbados.

Acknowledgment and Signature I, _____ (print name), acknowledge that I have read and understood the Workers' Code of Conduct and agree to comply with its provisions.

Signature: _____Date: _____

The Contractor's Human Rights Declaration

China Railway Shanghai Engineering Group Co., Ltd declares that it will respect and protect the human rights of every employee, contractor, subcontractor, and community member, within the confines of the laws of Barbados and applicable international standards, by ensuring:

- ***Freedom of Movement***: CRSEG will respect workers' right to freely move within and outside of the project.
- ***Non-Discrimination and Equal Opportunity:*** Prohibition of discrimination based on race, color, ethnicity, religion, gender, age, nationality, language, disability, sexual orientation, or disability, migrant status, or any other status.
- **Fair Working Conditions:** Commitment to fair remuneration, reasonable working hours, rest periods, and leave entitlements and a safe, healthy and dignified work environment.
- **Elimination of Exploitative Labor:** Commitment to a zero-tolerance policy for modern slavery, forced labor, debt bondage, human trafficking, and child labor across all its operations and supply chains.
- **Freedom of Association:** Respecting employees' rights to form or join trade unions of their choice, and engage in collective bargaining.
- **Privacy and Data Protection:** Upholding the privacy of employees, community members, complainants, victims of SH/SEA/GBV, clients, and other stakeholders when handling their personal information.

8.4.8.6. Conduct Toward Neighboring Land and Agricultural Property

The Project site adjoins working agricultural land, and the conduct of the workforce at the boundary with that land is a distinct requirement of this Code.

The requirements below apply to all workers, subcontractor personnel and suppliers across the plant upgrade, the reclamation facility and the campsite.

Workers do not enter farms, agricultural plots or other private property without authorization, and do not use neighboring farms or private property as shortcuts, gathering areas or recreational space. Workers do not take, harvest, remove, consume or damage crops, fruit, livestock, equipment or any other property belonging to farmers, residents, the Government or any third party, and do not remove an item on the assumption that it is abandoned or freely available. Workers do not interfere with farming activities, operations, equipment or produce, and comply with lawful instructions from a landowner, farmer or authorized representative concerning access. Workers do not threaten, intimidate, argue with or retaliate against a farmer, a complainant, a witness or any other community member. Where a worker is unsure whether access is permitted, the worker stops and seeks guidance from the supervisor before proceeding.

Four arrangements give effect to these requirements. The campsite boundary, the approved work areas, the access routes and the adjoining farms and private property are identified on the ground with signage, mapping, fencing or route markers, so that the limit of the approved area is visible to the person working at it. Supervisors know where their crews are working and are accountable for keeping them within the approved areas during working hours, and movement to and from the campsite is managed so that adjoining property is protected. Every worker is briefed before starting work or taking up accommodation, and briefed again whenever requirements change or following a serious community incident. And any suspected or actual incident of trespass, praedial larceny, damage to property, intimidation or conflict with a neighboring landowner is reported immediately through the Grievance Redress Mechanism and to the designated supervisor, with the Contractor notifying the PEU without delay.

A complaint that discloses a problem with worker behavior, supervision, communication or access arrangements is closed through the corrective action procedure, and the record states the issue, the action required, the party responsible, the completion date and how the PEU confirms the matter has been addressed. The Contractor identifies a representative to work with the Unit in maintaining communication with neighboring farmers and other affected parties. Violations of this Code by contractor personnel, subcontractors, suppliers or workers may give rise to liability, and any associated claims, losses or insurance matters rest with the Contractor in accordance with its contractual obligations and insurance arrangements.

All workers, subcontractors, suppliers and other personnel engaged in Project-related activities shall comply with the requirements of this Code of Conduct concerning neighboring farms, agricultural plots and private property. Compliance is mandatory both within the Project site and during movement to and from the Workers' Campsite and other Project work areas. The same requirements are carried in the camp rules under Section 8.4.7, and the duty to issue them in a language the worker reads and to verify compliance is recorded as commitments C-34 and C-35 in the Commitments Register at Annex H.

Any suspected or actual incident involving praedial larceny, unauthorized entry, removal of crops or other property, damage to agricultural land, unauthorized vegetation clearing, intimidation, threats or conflict with a neighboring landowner shall be reported immediately to the designated site supervisor and through the Project GRM. The Contractor shall notify the PEU without delay through the established reporting channels.

The Contractor shall ensure that:

- Complaints are acknowledged promptly, recorded and referred to the appropriate responsible personnel for assessment and investigation.
- The circumstances of the incident are documented, including the location, date, persons involved where known, property affected, evidence available and immediate actions taken.
- Relevant evidence is preserved and affected persons are treated respectfully, without pressure to withdraw a complaint or participate in an informal settlement.
- Where a potential breach of this Code is identified, appropriate interim safeguards and corrective measures are implemented while the matter is investigated.
- Findings are reviewed by Contractor management and the PEU, as appropriate, and corrective actions are documented, assigned to a responsible person and monitored to completion.
- Appropriate disciplinary measures are applied where a breach is established, in accordance with applicable law, employment arrangements and contractual requirements. Where conduct may constitute a criminal offence, referral to the competent authorities shall be made as appropriate.
- Farmers, complainants, witnesses and other affected community members are protected from threats, intimidation, harassment or retaliation.

The Contractor shall maintain records of reported incidents, investigations, corrective actions, disciplinary outcomes where applicable, and measures taken to prevent recurrence. Confidentiality shall be maintained in accordance with the GRM and applicable requirements.

Mandatory induction and refresher training shall explain the prohibition of praedial larceny and unauthorized access, the protection of neighboring property, appropriate conduct during interactions with farmers and community members, and the immediate reporting requirements. These topics shall also be reinforced through toolbox talks following significant incidents or when monitoring identifies recurring concerns.

Compliance with these provisions shall be monitored by Contractor management and the designated social and environmental personnel, with oversight by the PEU. Repeated breaches or inadequate corrective action shall trigger a management review and strengthened supervision.

8.4.9. SH/SEA/GBV Prevention and Response Plan

8.4.9.1. Introduction

This Plan sets out the project's commitment to preventing and responding to SH, SEA, and GBV under the Barbados Climate Resilient South Coast Water Reclamation Project and Reuse Facilities. It applies to all workers, subcontractors, security personnel, community members, and visitors.

The Plan is the central instrument that operationalizes the Code of Conduct, the Labor Management Plan and the Community Health Plan. It translates conduct expectations, worker welfare and accommodation, grievance handling, and community health findings into practical prevention, reporting, referral, and disciplinary procedures. It will be updated if monitoring shows new or recurring patterns or gaps.

Barbados faces high GBV prevalence. Risks are linked to labor influx, traffic changes, security deployment, and economic stressors. Women, girls, men, boys, LGBTIQ+ persons, PWDs, youth, migrants, and older persons are explicitly recognized as potentially differently affected.

8.4.9.2. Objectives

This plan seeks first to prevent risks by anticipating and reducing SH/SEA/GBV linked to worker–community interactions, camp operations, security deployment, and traffic diversions. It also aims to

protect survivors through confidential, survivor-centered referral pathways that ensure safe reporting and timely access to medical, psychosocial, legal, and protection services.

Equally important is the objective to promote accountability, enforcing a zero-tolerance policy across all employees, subcontractors, and security personnel, supported by training, supervision, and sanctions. The plan further commits to aligning with international and national standards, fulfilling obligations under CEDAW, the Beijing Platform for Action, national gender equality priorities, and IDB Performance Standard 9.

Finally, it seeks to strengthen community health by operationalizing commitments in the Code of Conduct, Labor Management Plan, and Community Health Plan, ensuring SEA/SH/GBV are addressed as critical health and social risk pathways.

8.4.9.3. Principles of the SH/SEA/GBV Prevention and Response Plan

The Plan is grounded in a principle of zero tolerance for sexual harassment, sexual exploitation and abuse, and gender-based violence. Mandatory referral applies to child abuse cases under national law, while adult referrals are consent-based. All misconduct is strictly prohibited and will trigger disciplinary action, including termination and referral to authorities, reflecting the Contractor's duty of care to workers, communities, and stakeholders.

It adopts a survivor-centered approach, prioritizing dignity, rights, and choice. Survivors determine if, when, and how to report, with strict guarantees of confidentiality, safety, and access to counseling, medical care, and legal assistance. Processes are designed to minimize re-traumatization and uphold respect and non-discrimination.

The Plan ensures confidential and accessible reporting, with multiple culturally sensitive channels available. Routine grievances follow standard timelines, while SH/SEA/GBV cases are acknowledged immediately, with safety and referral measures provided within 24 hours. Survivor consent guides all resolution actions.

A principle of non-retaliation protects all who report in good faith from intimidation or discrimination. Clear accountability structures assign responsibility to the Project Manager, HR for worker cases, and Social/Community Focal Points for community cases, with at least one female focal point designated for SH/SEA/GBV.

Finally, the Plan is integrated with broader safeguards, aligning with ESIA/ESMP commitments, national legislation, and IDB Environmental and Social Performance Standards.

Table 137 presents the alignment of the SH/SEA/GBV Prevention and Response Plan with project safeguards and supporting documents.

Table** 137**: Alignment of the SH/SEA/GBV Prevention and Response Plan with project safeguards and supporting documents

<table>
<tr><td colspan="3">SH/SEA/GBV Prevention and Response Plan

Central integrating instrument for prevention, reporting, referral, monitoring, sanctions, and survivor-centered response</td></tr>
<tr><td>Project safeguard plans</td><td>Draft supporting documents</td><td>Compliance framework</td></tr>
<tr><td>• ESIA and ESMP
• Workers’ Health and Safety Plan
• Emergency Response Plan
• Incident Management Plan
• Community Health and Safety Plan</td><td>• Draft Code of Conduct
• Draft Labor Management Plan
• Draft Community Health Assessment and Community Health Plan</td><td>• IDB ESPS 1, 2, 3, 4, 5, 6, 8, 9, and 10
• Applicable national labor, human rights, health, safety, environmental and grievance-management requirements</td></tr>
<tr><td colspan="3">Aligned outcomes

Consistent worker conduct expectations • confidential reporting • survivor-centered referral pathways • community health risk management • monitoring indicators • disciplinary action • corrective action and continuous improvement</td></tr>
</table>

Prevention is strengthened through **training and awareness**. All workers undergo mandatory induction training on SH/SEA/GBV, with regular refresher sessions and scenario-based exercises. Training content and exercises will be designed to reflect the diverse realities of different groups including men, women, youth, migrants, persons with disabilities, and other vulnerable populations rather than relying only on generic examples. Awareness materials will be provided in accessible formats, such as plain language, large print, sign language interpretation, and other inclusive methods, to ensure that all workers can fully understand and engage with the content.

Finally, the Plan emphasizes **monitoring and sanctions**. A confidential grievance register is maintained, with monthly reviews and quarterly reporting (noting that for SH/SEA/GBV cases, survivors’ details are kept fully anonymous and confidential) to the Project Execution Unit and Barbados Water Authority. Violations result in clear disciplinary measures, including suspension, termination, and referral to legal authorities, ensuring that accountability is enforced transparently while protecting survivor confidentiality.

8.4.9.4. Phase specific planning

Effective prevention and response to SEA/SH/GBV requires a dynamic approach that evolves with the project lifecycle. Each phase, pre-construction, construction, and early operations, presents distinct social, cultural, and operational contexts that shape risk exposure and mitigation strategies.

Phased planning ensures safeguards remain responsive to changing environments, workforce composition, and community interactions. It enables proactive identification of vulnerabilities, embeds

accountability during high-activity periods, and sustains respectful engagement as operations stabilize. By integrating SEA/SH/GBV considerations into every stage, the project reinforces its commitment to zero tolerance, survivor-centered protection, and inclusive community relations, in alignment with IDB Environmental and Social Safeguards (ESPS 1, 4, and 9) and Barbados' national labor and human rights legislation.

Implementation will be coordinated with the Code of Conduct and Labor Management Plan to ensure worker obligations, supervisor responsibilities, disciplinary pathways, welfare provisions, and grievance procedures are mutually reinforcing. Findings from the Community Health Assessment will guide phase-specific outreach, monitoring priorities, and referral readiness, particularly where labor influx, accommodation, traffic, or site access may elevate risks. Risk analysis will explicitly examine differential impacts on vulnerable groups, including women, men, children, LGBTIQ+ persons, persons with disabilities, migrants, and older persons, using disaggregated data from the GRM and Community Health Assessment to capture variations in exposure, access, and outcomes.

Planning for each phase

This section sets out the planning logic that applies across the project lifecycle. It establishes how SEA/SH/GBV prevention, confidential reporting, referral readiness, worker conduct, grievance management, consultations with different groups including women's groups, youth and disability advocates to verify measures are working on the ground and monitoring will be adjusted as the project moves from preparation to construction and then to early operations and handover.

Phase 1

Phase 1 establishes the enabling conditions for prevention and response before major site activity begins. The emphasis is on finalizing policies, aligning the Code of Conduct, Labor Management Plan and Community Health Plan with project procedures, assigning implementation responsibilities, preparing the GRM, and ensuring that training and referral arrangements are in place before workforce mobilization.

In addition, Phase 1 will ensure that:

- At least one female focal point is designated with responsibility for SH/SEA/GBV cases.
- Safe, confidential, community-level reporting channels are operational, allowing women, men, girls, boys, and vulnerable groups to raise concerns without fear of retaliation.
- Referral arrangements with protection services, medical care, psychosocial support, and legal assistance are established and tested, ensuring readiness before workforce mobilization.

The labor influx risk screening is reported in full in Section 7.6.8 of the Gender and Social Assessment and is summarized here only as it bears on this Plan.

Key GBV/SEAH Risks Identified in the Labor Influx Screening

The screening rates GBV/SEAH as Very High before mitigation and High after (Section 7.6.8), because the consequence of an incident remains severe however well its likelihood is controlled. The rating reflects the combination of labor influx, workforce demographics, community proximity, economic asymmetries, and the potentially severe consequences of SEA/SH/GBV incidents. The residual risk

therefore requires continuous monitoring, reporting, supervision, and enforcement of the Code of Conduct.

Figure 74 illustrates initial labor influx risk screening framework.

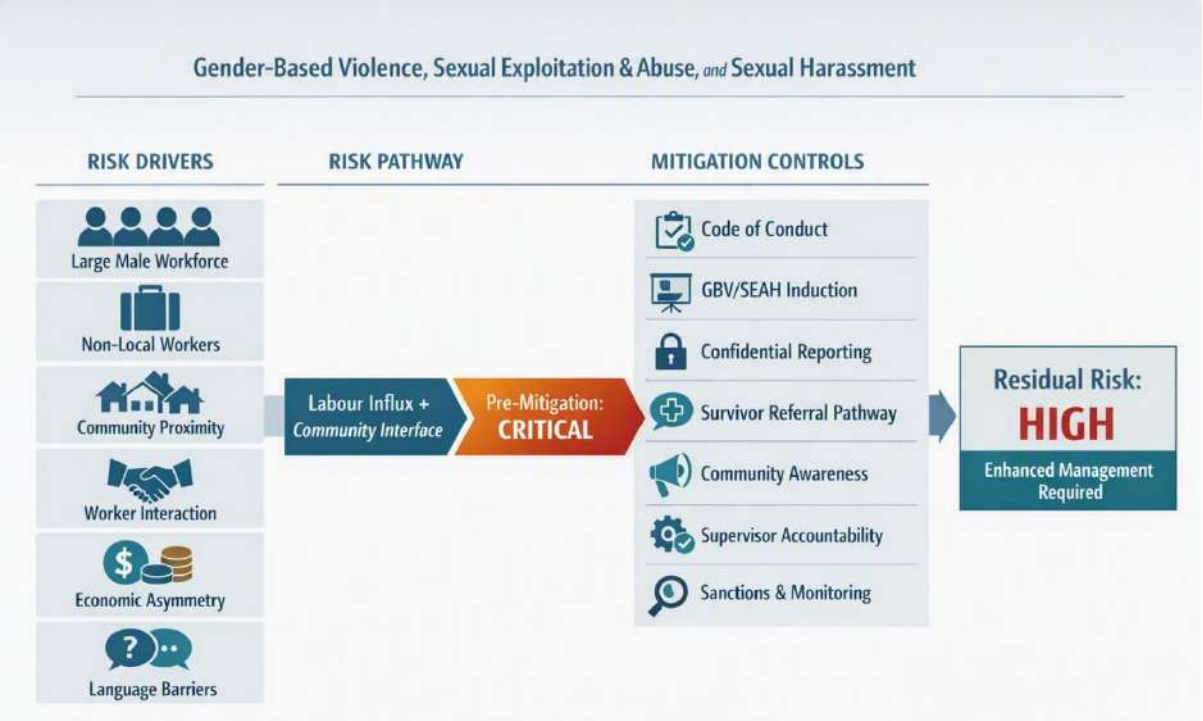


Figure 74**: Initial labor influx risk screening framework**

Pre-Construction Phase

This phase focuses on establishing the foundational policies, frameworks, and preparatory measures before any significant workforce is mobilized.

Policy and Framework Development:

- Develop and enforce a zero-tolerance sexual harassment policy, ensuring workers receive it upon arrival that is delivered alongside the contractor's health and safety policy.
- Establish employment discrimination policies in accordance with Barbadian laws and regulations.

Outline contractor obligations regarding worker management and compliance reporting.

Risk Assessment and Gender Analysis:

- Screen for Labor Influx Risk (see Section 7.6.8) and leverage Labor Management Plan and Community Health Assessment to characterize the likelihood and significance of labor influx, worker accommodation, community health, and SEA/SH/GBV impacts. The contractor, in coordination with the PEU and relevant social and environmental specialists, will be responsible for developing the Labor Influx Risk Screening. The PEU will review and validate the screening to ensure consistency with project safeguards and compliance requirements.

- If inherent gender-based risks are identified, a detailed gender analysis will be mandatory to determine disproportionate impacts by gender and other intersecting vulnerabilities. Particular attention will be given to women, girls, youth, children, persons with disabilities, older persons, and low-income households. Mitigation actions will be designed and implemented for each group to address identified risks, ensuring that project measures are inclusive, equitable, and responsive to the needs of those most exposed to harm or barriers to reporting.

Human Resources and GRM Setup:

- Establish the Human Resource Team and define roles, including the HR Representative responsible for managing SEA/SH/GBV reports. In addition, the Social Personnel will have defined responsibilities for handling sensitive community-level SH/SEA/GBV cases, ensuring survivor-centered approaches and coordination with external protection and support services. At least one female focal point will be included on the team to provide trusted, gender-sensitive access for survivors and complainants.
- Develop and communicate the project's GRM for both workers and communities, including the multi-tiered resolution hierarchy, anonymous reporting, simple language and multiple languages and disability accommodations, and timelines.
- Train GRM personnel on how the mechanism works, basic training on SH/SEA/GBV cases and survivor-centered approach for handling sensitive cases, confidentiality protocols, and who to consult for different issue categories.

Training and Awareness Planning:

- Develop induction and refresher training materials covering the Code of Conduct, SH/SEA/GBV provisions, scenarios of unacceptable behavior, and how to use the GRM (including anonymous and confidential reporting options).
- Plan community engagement which may include having women-only, youth focused and PWDs inclusive sessions, and training on gender inclusion, SEA/SH/GBV, and harassment, including how to report cases.

Accommodation Planning:

- Ensure adequate provisions for female workers, including separate dwelling and bathroom facilities equipped with locks, proper lighting, and safe access routes. Clear and enforced camp rules against harassment will apply in and around the camp and women's facilities, supported by supervision and grievance mechanisms to ensure safety and dignity.

Phase 2

Phase 2 is the period of highest implementation intensity and therefore requires active supervision, frequent communication, and rapid response capacity. During construction, the Plan focuses on enforcing worker conduct standards, strengthening community engagement, maintaining accessible reporting channels, monitoring accommodation and site-community interfaces, and addressing SEA/SH/GBV risks linked to workforce presence and construction activities.

Construction Phase

This phase involves active project work with a potentially large and diverse workforce, requiring continuous implementation, monitoring, and proactive engagement with the surrounding community.

Worker Management and Conduct:

- Enforce the Workers' Code of Conduct diligently, in coordination with the Labor Management Plan, responding to any reports or suspected violations promptly.

Ensure all workers receive and sign the Code of Conduct, explicitly highlighting mandatory behaviors regarding sexual and gender safeguards. Gendered misconduct, including catcalling, sexist jokes, targeted bullying and homophobic slurs, is treated as a Code of Conduct violation.

- Prohibit alcohol misuse, smoking or vaping, illegal substances, gambling, fighting, and other disruptive conduct within the worksites or surrounding community, with clear disciplinary actions.
- Manage accommodation and welfare arrangements to support privacy, safety, and orderly conduct, including clear access controls and supervision.
- Provide specific provisions for female workers' safety and inclusion (sanitation, PPE fit, washroom and changing areas, protection from harassment by co-workers and supervisors.

Ongoing Training and Awareness:

- Provide regular induction and refresher training to all personnel on community health and safety requirements identified in the Community Health Plan, worker conduct requirements set out in the Code of Conduct, GRM and grievance reporting, and security-related expectations.

Conduct regular Sexual and Gender-Based Violence training with all workers. CRSEG confirmed in November 2026 that training on local legislation and gender-based violence is delivered by the HSE Officer, Wu Dequan, in batches set by the number of workers mobilizing each month; each batch is trained within five days of the last worker in that batch starting work, and every worker receives at least one session each year.

- Utilize toolbox talks to reinforce key risks, lessons learned, and expectations for respectful community interactions and engagement.
- Educate foreign workers on local laws regarding SEA/SH/GBV and cultural norms.

Community Engagement and Grievance Management:

- Implement the community GRM effectively, managing grievances related to worker behavior, noise, traffic, and other community-facing impacts.
- Include gender vulnerability in local engagement by discussing the GRM and how community members including vulnerable groups can safely report concerns.
- Promote safe space engagements and equitable participation in consultation and stakeholder engagement processes, regardless of gender, sexual orientation, or gender identity.
- Work with law enforcement to maintain social stability and prosecute offenders in accordance with Barbadian laws.

Monitoring and Supervision:

- Monitor SEA/SH/GBV incidents regularly which includes analysis by age and sex and track patterns.
- Conduct weekly formal inspections of worker accommodation interfaces and implement mitigation measures.
- Review social and gender-related incidents, complaints, and trends monthly, and consult with community representatives (including women, PWDs, and youth).
- Manage alcohol and substance consumption among workers.
- Ensure transient workers are allowed to go home at intervals to spend time with family and friends and encourage them to socialize away from the project area.

Phase 3

Phase 3 focuses on sustaining safeguards as the project transitions from construction to operations and handover. The priority is to embed SEA/SH/GBV prevention and response requirements into operational management systems, confirm that unresolved grievances and referral arrangements are properly transferred, and ensure that remaining workers and new operational staff continue to apply the Code of Conduct, GRM, and community health and safety commitments.

Early Operations/Handover Phase

This phase involves the transition from construction to operational activities, with a potentially smaller, more stable workforce (noting that there can still be risk of SH/SEA/GBV), and focuses on sustained vigilance and institutionalizing the prevention and response mechanisms.

Sustained Compliance and Policy Enforcement:

- Continue to enforce the zero-tolerance SEA/SH/GBV policy and the Workers' Code of Conduct for all operational staff, contractors, subcontractors, security personnel, etc., consistent with the Labor Management Plan and any handover requirements arising from the Community Health Assessment.

Ensure that any new hires during early operations receive full induction and training on the Code of Conduct and SEA/SH/GBV provisions.

GRM Functionality and Accessibility:

- Maintain the visibility, functionality and accessibility of the GRM for both plant workers and the surrounding communities, businesses, citizens, and tourists.
- Regularly communicate the GRM, including contact information, through notice boards and community engagement efforts.
- Address cultural norms and language differentiation during this phase, even if language issues are less likely to apply to plant workers. Awareness of local customs and respect for community members remains crucial.

Community Relations and Monitoring:

- Continue monitoring worker behavior and community interactions, particularly with businesses, citizens and tourists, ensuring respectful engagement.
- Regularly review and analyze community complaints and trends for gendered patterns, especially those related to worker conduct, and take corrective actions as needed.
- Collaborate with local authorities and law enforcement for social stability and to address any incidents.

Handover Documentation and Training:

- Ensure that all relevant SEA/SH prevention and response policies, procedures, and training materials are documented and effectively handed over to the operational management team.
- Provide specific training to the operational staff responsible for managing social risks and grievances, particularly concerning gender equality and SEA/SH/GBV risk management.
- Conduct a final assessment of social and gender-related incidents and trends, ensuring that mitigation measures remain effective and responsive to community need.

Confidential reporting channels

- The Human Resources (HR) Representative is responsible for maintaining "confidential reporting channels for harassment or discrimination".
- Serious allegations such as SH/SEA/GBV and child abuse are to be immediately escalated to designated persons (HR and/or HSE Representative) and relevant authorities.
- The internal investigation process for such cases will be managed according to the Grievance Redress Mechanism (GRM) system and will be aligned with the confidentiality, non-retaliation, and worker-management requirements set out in the Code of Conduct and Labor Management Plan.
- Workers can report violations in the workplace and local community through the Grievance Mechanism for all types of complaints. The person's identity will be kept confidential unless mandated by law, and anonymous complaints will be considered.
- Additional external referral pathways are summarized in Table 111, which lists verified service providers and contact points for health, psychosocial, legal, shelter, and protection support.

Survivor-Centered Referral Arrangements:

- CRSEG commits to "survivor-centered principles for managing SH/SEA/GBV cases," including confidentiality, consent, referral pathways to support services, safety, respect, and non-discrimination.
- The Code also affirms every worker's right to raise concerns or report incidents affecting their physical, psychological, or sexual safety without fear of intimidation, discrimination, or retaliation, and to access and use the Project's GRM for resolution in a fair, confidential, and timely manner.

Sanctions and Disciplinary Framework:

- Violations of the Code of Conduct may result in disciplinary actions, up to and including termination of contract or employment, depending on the severity and impact of the misconduct. The application of sanctions should be consistent with the Labor Management Plan and the worker discipline procedures communicated during onboarding.
- CRSEG will employ a warning system for misconduct, which includes (but is not limited to) illegal possession and use of alcohol, drugs, unlawful possession of firearms, and fighting.
- The HR Officer will develop a policy guiding the degree of sanctions, to be shared during onboarding. Sanctions could include verbal warnings, written warnings, Performance Improvement Plans (PIP), final written warnings, suspension, or termination.
- The decision to impose disciplinary measures will align with contractual agreements, legal obligations, and organizational policies, specifically referencing the Employment Rights Act, 2012, and the Severance Payment Act of Barbados.
- Sexual activity with individuals under the age of 18 is strictly forbidden, and violations will be referred to the Barbadian Police Authorities for enforcement under the full extent of the law.
- Any violation of the Code by Workers will result in serious consequences, including termination and possible referral to legal authorities. For SH/SEA/GBV violations, sanctions will bypass the normal warning system and normally lead to immediate suspension pending investigation. If substantiated, such violations will result in termination and referral to relevant authorities. Sanctions for SH/SEA/GBV cases will be clearly differentiated from lesser misconduct (e.g., lateness, minor safety breaches) to demonstrate the seriousness of these offenses. All sanctions will be applied consistently and without exception, regardless of worker rank, nationality, or contract type, ensuring fairness and accountability across the workforce.

Monitoring and Reporting Indicators:

- The HR Representative is responsible for monitoring compliance with the Code of Conduct, while monitoring indicators should also draw from the Labor Management Plan and the Community Health Plan to track worker conduct, grievance trends, referral readiness, and community health and safety concerns.
- The Project Manager is responsible for managing incidents between workers and residents, oversight of serious incidents, and reporting such incidents to the Employer/Project Execution Unit (PEU) and/or other relevant authorities and stakeholders.
- Training records, including attendance information, will be "disaggregated and reported to the Employer/PEU".
- The Grievance Mechanism process includes steps for receiving, assessing, logging, and resolving grievances, with a timeline for resolution and escalation for unresolved cases.

Training and Awareness Requirements, Including Records of Participation:

- Employees must complete relevant training courses related to the environmental and social aspects of the project, including Sexual Exploitation and Abuse, Sexual Harassment, Gender-Based Violence, use of the Grievance Mechanism, requirements of the Code of Conduct, labor

obligations under the Labor Management Plan, and relevant community health and safety risks identified in the Community Health Assessment.

- Training will include introductory sessions and refresher training on the CoC, conducted in languages understood by personnel, and will occur prior to the start of construction.
- Training records, including attendance information, will be disaggregated and reported to the Employer/PEU, specifying frequency (induction vs. refreshers) or specialized training for key roles, and will be available for inspection.
- All employees are required to read, understand, and sign the Code of Conduct, acknowledging their agreement to adhere to it.

Safeguarding Guidelines for SH/SEA/GBV Training Facilitators, ESM Consultants, HR Representatives and others

This section provides safeguarding guidance for organizations, supervisors, colleagues, and project teams working with SGBV/SEAH training facilitators. It recognizes that facilitators delivering training on SGBV, SEA, SH, and related safeguards may themselves experience harassment, discrimination, intimidation, reputational harm, or retaliation because of the sensitive nature of their work and the power dynamics it challenges. The guidance should be applied as a supplement to the Project's GRM, enhanced GBV/SEAH procedures, Code of Conduct, Labor Management Plan, and associated capacity-building arrangements.

The safeguarding guidance in this section was developed based on safeguarding guidelines prepared for the 3R-CReWS project, which focuses on upgrading the Bridgetown Sewage Treatment Plant (BTSP). It has been adapted for this SH/SEA/GBV Prevention and Response Plan to support safe delivery of SGBV/SEAH training and related capacity-building activities under the Barbados Climate Resilient South Coast Water Reclamation Project and Reuse Facilities.

Purpose and Scope

The purpose of these guidelines is to ensure that internal and external facilitators are protected, supported, and able to deliver SGBV/SEAH training safely and professionally. The guidance applies to project staff, contractors, supervisors, training participants, contract managers, implementing agencies, and partners involved in the design, delivery, supervision, evaluation, or follow-up of SGBV/SEAH training and capacity-building activities.

Core Safeguarding Principles

- Survivor-centered approach: facilitators who experience harassment or abuse must be treated with dignity, respect, confidentiality, autonomy, and informed consent. They may choose whether, when and how to report grievances and can pause or withdraw without losing access to support.
- Do no harm: responses must avoid exposing facilitators to further harm, stigma, intimidation, reputational damage, or unwanted attention.
- Non-retaliation: facilitators must be protected from adverse contractual, employment, reputational, or professional consequences for reporting or disclosing harassment.

- Equity and intersectionality: responses should recognize that facilitators may face different risks due to intersecting identities, including gender, disability, migrant status, minority status, or other factors that may increase vulnerability.

Organizational Responsibilities

- Establish clear anti-harassment and safeguarding procedures that explicitly cover training facilitators, contractors, and consultants.
- Ensure leadership communicates zero tolerance for harassment, discrimination, intimidation, or retaliation in training environments.
- Provide facilitators with accessible information on their rights, reporting options, safeguarding focal points, GRM procedures, referral pathways, and available support services before training begins.
- Maintain safe, confidential, and accessible reporting channels, including options for anonymous reporting or escalation outside the immediate training environment where appropriate.
- Respond promptly and sensitively to concerns, including through psychosocial support, medical referral, legal information, safety planning, and adjustment of assignments where necessary.
- Investigate complaints fairly, impartially, and confidentially, using external expertise where needed to ensure credibility and independence. To avoid conflicts of interest, any investigation or facilitation of complaints will be kept separate from those who commissioned or evaluated the training. This ensures that investigators are not influenced by prior involvement and that findings remain credible and impartial.

Preventive Measures Before and During Training

- Conduct a pre-training risk assessment that considers power dynamics, location, participant profile, institutional context, past incidents, survey feedback, warning signs, and potential red flags.
- Agree escalation arrangements before training, including when to contact the Project Gender, Stakeholder and GRM Specialist, relevant social inclusion and gender specialists, security, or contract management staff.
- Pair facilitators where possible, especially in higher-risk contexts, to reduce isolation and strengthen safety and peer support.
- Set ground rules at the start of every training session (which should be visibly supported by Management), including respectful engagement, zero tolerance for harassment, and redlines for behavior that may result in intervention, sanctions, or removal from the session.
- Intervene promptly when inappropriate conduct occurs, support the facilitator, reinforce boundaries, and document the incident in accordance with confidential reporting procedures.
- Use participant feedback, including anonymous feedback where appropriate, to identify problems early and adapt facilitation and safeguarding arrangements.

Peer, Supervisor, and Contract Management Support

- Colleagues should listen without judgment, affirm facilitators' experiences, avoid blame, and offer practical support such as accompanying the facilitator to report or helping document incidents.
- Supervisors and contract managers should promptly review training reports for warning signs, red flags, inappropriate conduct, or incidents requiring follow-up.
- Contract supervision should provide immediate practical support, document incidents, respect the facilitator's choices, and escalate concerns where further prevention, mitigation, or sanctions may be required.
- Project teams should create safe spaces for facilitators to debrief, share challenges, contribute to safeguarding improvements, and inform the design and evaluation of future training. Any retaliation or poor performance ratings linked to a facilitator's reporting of harassment are strictly prohibited and sanctionable. Facilitators' safeguarding experiences will be included as a standard item in post-training reviews and contract evaluations, ensuring that their input directly informs program improvements and accountability measures.

Special Considerations

- Facilitators from marginalized or minority groups may face heightened risks and should receive specific briefings, debriefings, and organizational support to address discrimination and barriers they may encounter.
- Remote and hybrid trainings must include clear online codes of conduct, procedures for managing online abuse, and confidential options for reporting virtual harassment.
- Training contracts and capacity-building terms of reference should include safeguarding expectations, reporting arrangements, facilitator support provisions, and flexibility for breaks, adjustments, or time off where harassment or stress affects well-being. Facilitators will have the explicit right to stop or pause a session if harassment occurs, without penalty or negative consequences. This safeguard ensures that facilitators can prioritize safety and well-being while maintaining the integrity of the training environment.

Monitoring, Reporting, and Learning

- Monitor safeguarding issues during training implementation, including warning signs, red flags, participant behavior, facilitator safety, and effectiveness of reporting and response arrangements.
- Include safeguarding issues affecting facilitators should be tracked using anonymized or coded data, disaggregated where possible in quarterly and annual GBV/SEAH reporting, while protecting confidentiality and avoiding disclosure of identifying information.
- Evaluate whether the GRM, referral pathways, contract supervision, and accountability frameworks are effective in protecting facilitators and addressing incidents.
- Use lessons learned from incidents, feedback, and debriefings to update training materials, facilitator guidance, contract language, and safeguarding procedures.

8.4.10. Community Health Plan

Objectives

The Plan prevents Project-attributable deterioration in the health status of communities within the Area of Influence. It reduces the likelihood of the three priority residual risks to as low as reasonably practicable and maintains response capability proportionate to their consequence. It establishes measurable health indicators with defined responsibilities, frequencies and corrective action triggers. It ensures that affected communities, including vulnerable groups, can access health information and raise health concerns safely and effectively. It completes the baseline verification actions at Section 5.7 within defined timeframes. It demonstrates compliance with Environmental and Social Performance Standard 4 and related standards, Barbadian law and Project contractual obligations.

Principles

Controls are designed to prevent exposure ahead of treating consequence. Control intensity is calibrated to assessed risk, with priority residual risks receiving priority supervision. Health information and sensitive grievances are handled with confidentiality, consent and non-retaliation, applying survivor-centered principles. The differentiated needs of women, children, older persons, persons with disabilities and lower-income households are addressed explicitly. Monitoring results, grievances and incidents drive revision of controls. Measures are written for direct use by supervisors and subcontractors, with a named responsible role attached to every action.

Governance, Roles and Responsibilities

Delivery of the Plan depends on accountability being assigned to identified roles within the Contractor's organization. This section allocates community health responsibilities across Contractor personnel, the Employer and the regulatory agencies, and Table 138 records that allocation.

Two features warrant note. Accountability for the Plan as a whole rests with the Project Manager, who holds the authority to stop work on health grounds. Day-to-day delivery is divided between the Health, Safety and Environment Representative for monitoring and incident response, the Camp Manager for camp-mediated pathways, and the Community Liaison Officer for the community interface, with a designated Community Health Focal Point coordinating across them and holding the relationship with the Ministry of Health.

Table** 138**: Community health roles and responsibilities

Role	Community health responsibilities
Project Manager	Ultimate accountability for Program implementation and resourcing; reporting of serious health incidents to the Project Execution Unit; authority to stop work on health grounds
Health, Safety and Environment Representative	Day-to-day implementation; delivery of the monitoring program; incident investigation; interface with the Environmental Protection Department and the Ministry of Health; maintenance of the health monitoring record
Community Health Focal Point	Named officer with specific responsibility for community health and safety;[114] coordination of vector control, health outreach, baseline verification and health service liaison

Role	Community health responsibilities
Community Liaison Officer	Community-facing communication; receipt of community concerns; delivery of outreach; coordination where grievances involve community members
Human Resources Representative	Worker health screening records; camp morbidity recording; confidential handling of sexual exploitation and abuse, sexual harassment and gender-based violence cases
Site Supervisors and Foremen	Daily implementation of traffic, particulate, waste and conduct controls; immediate reporting of community-affecting incidents
Camp Manager	Camp sanitation, catering hygiene, vector control within the camp, occupancy density, isolation arrangements
Subcontractors	Bound by the same requirements through contract, reporting through the Contractor
Project Execution Unit and Barbados Water Authority	Oversight, review of reports, verification, approval of corrective action plans
Inter-American Development Bank	Supervision against Environmental and Social Performance Standard requirements
Ministry of Health and Wellness	Vector control coordination; communicable disease notification and outbreak response; health service capacity
Environmental Protection Department	Environmental quality standards and incident notification

The Community Health Focal Point is designated and introduced to the Project Execution Unit before mobilization, with qualifications submitted for confirmation. The Project Execution Unit has recorded that personnel identified with health, safety and environment responsibility are to be introduced to the Unit,[115] and this Program applies that requirement to the Community Health Focal Point.

Plan Components

This section sets out the twelve management components through which the impacts assessed in Part A are controlled. Each component corresponds to a pathway at Section 7.7 and specifies the measures to be applied, the frequency of application, the responsible role, and where relevant the escalation or work stoppage trigger.

[114] Environmental Solutions Ltd., *Barbados Climate Resilient South Coast Water Reclamation Plant (BA-L1063), Updated Environmental and Social Impact Assessment and Environmental and Social Management Plan*, revised 16 April 2024. Community Health and Safety Management at section 9.7; community health concerns recorded in consultation at p. 221; vector-borne disease context at p. 97. (Environmental Solutions Ltd., 2024)

[115] Fajardo, S., *Environmental Report No. 004, Revision 02: Review of CRSEG ESIA/ESMP for Workers' Campsite Version 2B*, South Coast Water Reclamation Project Environmental Management System, reference SCWRP-EMS-ER-002, issued 10 July 2026, approved 22 July 2026. Omission of noise and ecosystem services from the environmental baseline at item 4, p. 1; naming of Graeme Hall Swamp at item 10, p. 2; water sampling methodology at items 19 to 21, pp. 4 to 5; identification and prioritization of ecosystem services at item 23, p. 6; impact rating methodology and risk level interpretation at items 31 to 34, pp. 8 to 9; waste definitions and categories at item 43, p. 12; consultation logistics at item 49, p. 13; field work representativeness at item 50, p. 14. (Fajardo, 2026)

Components are calibrated to assessed risk. The three components addressing priority residual risks, being road safety at Section 8.4.7, sexual exploitation and abuse together with sexual harassment and gender-based violence at Section 8.4.9, and emergency preparedness at Section 8.4.3, carry the most prescriptive measures, the shortest response times and dedicated escalation triggers. Components addressing pathways with Low residual significance are proportionately lighter.

Each component is delivered through, and reported against, the indicators at Section 8.5.

Vector Surveillance and Control

Table 139 presents the vector surveillance and control measures.

Table 139***: Vector surveillance and control measures***

Measure	Frequency	Responsible
Inspection of the site, camp and 50-meter perimeter for standing water, containers, tires, tarpaulins and blocked drainage	Weekly, and within 24 hours following rainfall exceeding the established trigger	Camp Manager
Elimination of identified breeding sites	Within 24 hours of identification	Site Supervisor
Maintenance of covered waste receptacles and removal of accumulated waste	Continuous, with collection per the Waste Management Plan	Camp Manager
Verification that camp wastewater systems are sealed and functioning	Weekly	Camp Manager
Verification that canal and drainage flow is unobstructed by works, stockpiles or sediment, preserving larvivorous fish movement	Weekly	Health, Safety and Environment Representative
Protection of the Ministry of Health fish breeding station through exclusion zone, runoff and sediment control, maintained staff access, and no works affecting its water supply without prior agreement	Continuous, verified monthly	Health, Safety and Environment Representative
Larval and adult vector index survey	Monthly	Qualified vector control provider
Coordination with the Ministry of Health vector control unit, including confirmation of the fogging and canal-clearing schedule and advance notice to workers and community before fogging	Quarterly	Community Health Focal Point
Community larval source reduction outreach addressing household container management	Twice during construction and before each wet season	Community Liaison Officer
Drainage maintenance on and adjacent to the access route	Monthly and following storms	Site Supervisor
Use of insect repellents containing DEET, picaridin, or	Continuous	Camp Manager and

Measure	Frequency	Responsible
lemon eucalyptus oil on exposed skin		workers
Wear long-sleeved shirts and long pants, especially during peak mosquito activity	Continuous	Camp Manager and workers
Installation of insect screens on windows and doors	Before camp occupation, then inspected monthly	Camp Manager, verified by Health, Safety and Environment Representative
Elimination of stagnant water Repellent use, protective clothing and window screening are occupational measures applied to the workforce inside the campsite. They reduce the campsite's function as a vector amplification point adjacent to the community, consistent with the occupational to community pathway described at Section 1.2. Provision of repellent, clothing and screening rests with the Camp Manager; correct use rests with individual workers and is verified through camp inspection.	Weekly	Site Supervisor/Camp Manager

Escalation applies where the vector index exceeds the established baseline in any month, or where three or more mosquito-related community complaints are received in a month. Escalation triggers joint review with the Ministry of Health and an intensified control response within seven days.

Particulate and Air Quality Management at Community Receptors

Table 140 presents the particulate and air quality management measures.

Table** 140**: Particulate and air quality management measures

Measure	Frequency	Responsible
Water suppression of dust, exposed soil, unpaved areas, haul routes and site entrance	As required to prevent visible dust migration, at the established minimum rate in dry conditions	Site Supervisor
Covering of stockpiles, transport containers, and securing of vehicle loads before departure	Every movement	Site Supervisor
Wheel-wash or equivalent at site exit, with sweeping of tracked material	Daily	Site Supervisor
Continuous monitoring of particulate matter at 10 and 2.5 micrometers at the nearest residential receptor and at the school-facing haul route, at the same referenced locations throughout	Continuous, logged	Health, Safety and Environment Representative
Visual boundary dust inspection	Daily	Health, Safety and Environment Representative

Measure	Frequency	Responsible
Advance notification to households with registered sensitive occupants before high-dust activities	Minimum 48 hours	Community Liaison Officer

Visible dust migration beyond the site boundary toward a residential or school receptor requires immediate suspension of the causal activity until suppression is effective.

Monitoring maintains the geographic points logged during the baseline sampling exercise, consistent with the commitment that all geographical points collected during air quality sampling be maintained throughout the construction and operational phases.[116]

Odor, Hydrogen Sulfide and Bioaerosol Control

Table 141 presents the odor, hydrogen sulfide and bioaerosol control measures.

Table* 141*: Odor, hydrogen sulfide and bioaerosol control measures

Measure	Frequency	Responsible
Continuous hydrogen sulfide monitoring with alarm at the camp boundary and the nearest community receptor	Continuous	Health, Safety and Environment Representative
Odor management procedure for bypass operations, sludge handling and tank openings	Every operation	Treatment plant interface supervisor
Scheduling of high-odor operations with reference to wind direction toward receptors	Per operation	Health, Safety and Environment Representative
Advance community notification of planned high odor works	Minimum 48 hours	Community Liaison Officer
Verification that camp intake, dining and recreation areas lie outside the modeled plume envelope	At camp commissioning and on any process change	Health, Safety and Environment Representative
Bioaerosol control through enclosure, spray suppression and restriction of aerosol-generating activity in adverse wind conditions	Continuous	Site Supervisor

Exceedance of the hydrogen sulfide alarm threshold requires immediate cessation of the causal activity, evacuation of affected areas under the Emergency Response Plan, and notification to the Project Execution Unit within four hours.

Noise, Vibration and Light Management

Table 142 presents the noise, vibration and light management measures.

[116] BrinsJen Systems Development Specialists, *Workers' Camp Environmental and Social Impact Assessment and Environmental and Social Management Plan*, Version 2B, prepared for China Railway Shanghai Engineering Group Co., Ltd., 2026. Community Health and Safety Plan at pp. 270 to 274; campsite occupancy and layout at p. 37; nearest residential receptor at p. 5; air quality sampling parameters and locations at p. 121; demographic profile at p. 292; language and labor force data at p. 294; schools identified at pp. 292 and 335. (BrinsJen Systems Development Specialists, 2026)

Table** 142**: Noise, vibration and light management measures

Measure	Frequency	Responsible
Restriction of high-noise activity, loading operations and other disruptive tasks to approved daytime working hours	Continuous	Site Supervisor
Generator and plant attenuation, with siting for maximum separation from dwellings	At mobilization and on relocation	Health, Safety and Environment Representative
Pre-construction condition survey of dwellings within the established distance of vibration-generating works	Once, before works	Independent surveyor
Noise monitoring at the nearest residential boundary, and at the school boundary during teaching hours, measured against the World Health Organization Community Noise Guideline values adopted under the National Noise Policy[117] and the construction noise limits identified in the HSE Management Manual[118]	Monthly and on complaint	Health, Safety and Environment Representative
External lighting directed downward and inward with shielding to minimize glare and spill	Continuous	Camp Manager
Night work notification to affected households	Minimum 72 hours before each occurrence	Community Liaison Officer

Complaints relating to noise, vibration or lighting are logged, investigated within 48 hours and closed with documented action. Investigation includes inquiry into how the disturbance affects the complainant's sense of safety and wellbeing, and mitigation is adapted accordingly.[119]

Water, Sanitation and Wastewater Exposure Control

Table 143 presents the water, sanitation and wastewater exposure control measures.

Table** 143**: Water, sanitation and wastewater exposure control measures

Measure	Frequency	Responsible
Verification of potable water quality at source and at point of use in the camp	Before occupation, then monthly	Health, Safety and Environment

[117] Environmental Protection Department, Government of Barbados, *National Noise Policy*, together with Environmental Protection Department guidance on Noise Pollution Control, recording that Barbados has no dedicated noise legislation, that Cabinet acceded to the Barbados Noise Policy adopting the World Health Organization Community Noise Guidelines as reference standards, and that noise is otherwise addressed through the nuisance provisions of the Health Services Act, the Marine Pollution Control Act and the Road Traffic Regulations. (Environmental Protection Department, Government of Barbados, n.d.)

[118] Construction noise limits specified in the manual include: i) Normal hours (Mon–Fri 07:00–18:00, Sat 07:00–12:00): L(A)eq(8h) = 85 dB(A), max 115 dB(A); ii) Restricted hours (Mon–Fri 18:00–22:00, Sat 12:00–22:00, Sun/holidays 10:00–18:00): L(A)eq(4h) = 65 dB(A), max 80 dB(A); and iii) All other times: L(A)eq(4h) ≤ 50 dB(A), max 55 dB(A)

[119] BrinsJen Systems Development Specialists, *Workers' Camp Environmental and Social Impact Assessment and Environmental and Social Management Plan*, Version 2B, prepared for China Railway Shanghai Engineering Group Co., Ltd., 2026. Community Health and Safety Plan at pp. 270 to 274; campsite occupancy and layout at p. 37; nearest residential receptor at p. 5; air quality sampling parameters and locations at p. 121; demographic profile at p. 292; language and labor force data at p. 294; schools identified at pp. 292 and 335. (BrinsJen Systems Development Specialists, 2026)

Measure	Frequency	Responsible
		Representative
Monitoring at the camp wastewater discharge point	Monthly	Health, Safety and Environment Representative
Groundwater monitoring at established baseline points	Quarterly	Health, Safety and Environment Representative
Inspection and maintenance of the camp wastewater treatment system	Weekly	Camp Manager
Spill prevention inspection of fuel and chemical storage with containment verification	Weekly	Site Supervisor
Verification that night soil is not used in the vegetable garden	Monthly	Camp Manager
Handwashing facilities and hygiene provision maintained at all welfare points	Continuous	Camp Manager
Confirmation of emergency bypass status, sluice gate functionality and the sewage spill protocol with the Barbados Water Authority	Before construction adjacent to the operating plant, then annually	Community Health Focal Point

Any wastewater or chemical release carrying potential for community exposure requires notification to the Project Execution Unit, the Environmental Protection Department and the Ministry of Health within four hours, and direct notification to potentially affected households within twelve hours.

Sample handling follows documented procedure covering container type, preservation, transport temperature and chain of custody, addressing the requirements identified in review of the water sampling methodology.[120]

Road Safety and School Zone Program

This component addresses a priority residual risk.

The Traffic Management Plan establishes requirements for transport and logistics optimization, operational emission control, and site preparation and management. Several of those measures act directly on the community health pathways assessed in this document. They are set out below so that the two instruments remain aligned and so that delivery can be verified against the indicators at Section 8.5.

[120] Fajardo, S., *Environmental Report No. 004, Revision 02: Review of CRSEG ESIA/ESMP for Workers' Campsite Version 2B*, South Coast Water Reclamation Project Environmental Management System, reference SCWRP-EMS-ER-002, issued 10 July 2026, approved 22 July 2026. Omission of noise and ecosystem services from the environmental baseline at item 4, p. 1; naming of Graeme Hall Swamp at item 10, p. 2; water sampling methodology at items 19 to 21, pp. 4 to 5; identification and prioritization of ecosystem services at item 23, p. 6; impact rating methodology and risk level interpretation at items 31 to 34, pp. 8 to 9; waste definitions and categories at item 43, p. 12; consultation logistics at item 49, p. 13; field work representativeness at item 50, p. 14. (Fajardo, 2026)

Measures reducing exposure frequency. Load optimization, which maximizes truck load capacity to reduce the total number of trips and eliminate empty running, reduces the number of heavy vehicle movements on the shared access road and therefore reduces the exposure frequency that drives the road traffic injury rating at CH-06. Route planning that selects the shortest routes and avoids sensitive environmental areas and heavily populated neighborhoods moves movements away from residential receptors and away from the two schools identified at Section 4.3.

Measures reducing emissions at the receptor. Use of modern fuel-efficient vehicles meeting current emission standards, together with cleaner alternatives where available, reduces roadside particulate and nitrogen dioxide concentrations at the residential and school receptors monitored under Section 8.5.2. A strict prohibition on idling for vehicles and machinery waiting to unload removes a concentrated source of exhaust at fixed points where people gather. Maintenance of transport vehicles and site machinery prevents oil leaks and reduces emissions, and connects to the vehicle inspection point raised at CH-06. Vehicles equipped with modern exhaust gas treatment, including selective catalytic reduction, reduce the same pollutants at source.

Measures reducing dust and road contamination. Planning site access roads for all-weather conditions prevents mud tracking onto public roads, which otherwise degrades local air quality, creates a skid hazard for other road users, and washes into the drainage network feeding Graeme Hall Swamp. Water spraying on site access roads during dry conditions prevents dust dispersion toward the receptors assessed at CH-02. Site layout planning that minimizes double handling and reduces idle time for cranes and forklifts lowers both noise and emissions at the boundary.

Measures addressing abnormal loads. Where heavy or oversized moves are required, specialized protocols and appropriate trailers prevent damage to the road surface and to adjacent property. Road sub-base degradation is assessed at CH-06 as a community impact in its own right, since it transfers a maintenance burden to residents and creates a hazard for pedestrians and cyclists using the same route.

Delivery of these measures is verified through the vehicle movement log, the weekly compliance audit at Section 8.5, and indicators KPI-10 to KPI-12. Where a measure in the Traffic Management Plan is revised, the corresponding entry in this Assessment is reviewed at the next issue.

Table 144 presents the road safety and school zone measures.

Table 144***: Road safety and school zone measures***

Measure	Frequency	Responsible
Prohibition of heavy vehicle community transit between 07:00 and 08:00 and between 15:00 and 16:30, except where specifically authorized for an emergency	Continuous	Site Supervisor and Traffic Warden
Speed limit of 15 kilometers per hour on the community access route and 10 kilometers per hour at the camp entrance and internal gate areas	Continuous	Traffic Warden
Trained traffic wardens positioned at critical bends, access points and the main gate	During all vehicle movement periods	Site Supervisor

Measure	Frequency	Responsible
Off-site vehicle staging at a designated holding area, with no queuing on public roads serving the community	Continuous	Logistics coordinator
Driver induction covering route restrictions, school zones, speed limits and community conduct	Before first movement, with refresher every six months	Health, Safety and Environment Representative
Vehicle movement log recording time-stamped route compliance	Every movement	Logistics coordinator
Access road inspection with prompt removal of mud, debris and spillage attributable to project traffic	Daily	Site Supervisor
Engagement with St. Luke's Academy and St Lawrence Primary School on movement schedules and pedestrian safety	Before mobilization, then each term	Community Liaison Officer
Compliance audit of transit windows and speeds	Weekly	Health, Safety and Environment Representative

Any pedestrian near-miss, or any breach of a school-hour transit restriction, triggers immediate suspension of the responsible driver, investigation within 24 hours, and report to the Project Execution Unit.

Communicable Disease Prevention

Table 145 presents the communicable disease prevention measures.

Table 145***: Communicable disease prevention measures***

Measure	Frequency	Responsible
Pre-mobilization health assessment applied consistently with Barbadian law, non-discrimination obligations and the Data Protection Act 2019	Before mobilization	Human Resources Representative
Verification of camp occupancy density and ventilation against the adopted standard	At commissioning, then monthly	Camp Manager
Isolation facility available with defined procedure for suspected communicable disease	Continuous availability	Camp Manager
Recording of camp illness presentations as a leading indicator	Daily recording, monthly reporting	Camp Manager
Worker health education covering respiratory hygiene, sexually transmitted infection prevention and vector protection, delivered in Chinese and English	Induction, with quarterly refresher	Health, Safety and Environment Representative

Measure	Frequency	Responsible
Food handler certification and periodic health check	Before engagement, then every six months	Camp Manager
Outbreak notification to the Ministry of Health	Within 24 hours of suspicion	Community Health Focal Point
Confidential access arrangements for sexual and reproductive health services	Continuous	Human Resources Representative

Three or more epidemiologically linked cases of the same illness within the camp within seven days constitutes a suspected outbreak and triggers notification, isolation and Ministry of Health engagement.

8.4.10.1. Sexual Exploitation and Abuse, Sexual Harassment and Gender-Based Violence: Community Interface

This component addresses a priority residual risk. Full arrangements are established in the Sexual Exploitation and Abuse, Sexual Harassment and Gender-Based Violence Prevention and Response Plan, and this Program delivers the community-facing elements.

Table 146 presents the sexual exploitation and abuse, sexual harassment and gender-based violence community interface measures.

Table* 146*: Sexual exploitation and abuse, sexual harassment and gender-based violence community interface measures

Measure	**Frequency**	**Responsible**
Community awareness sessions covering prohibited worker conduct and available reporting channels	Before mobilization, then every six months	Community Liaison Officer
Confidential and anonymous reporting channels accessible to community members as well as workers, including multilingual hotline, anonymous drop boxes and secure email	Continuous	Human Resources Representative and Community Liaison Officer
Survivor referral directory covering medical, psychosocial, legal, police and child protection services	Established before mobilization, verified quarterly	Community Health Focal Point
Separate confidential case register held apart from the general grievance log, with restricted access	Continuous	Human Resources Representative
Non-retaliation protection communicated to workers and community	Induction and community sessions	Human Resources Representative and Community Liaison Officer
Worker induction and refresher on the Code of Conduct, using scenarios of acceptable and unacceptable behavior with community members and covering use of the grievance	Induction, with quarterly refresher	Health, Safety and Environment Representative

Measure	Frequency	Responsible
mechanism including anonymous and confidential reporting		
Reporting of case numbers and resolution times without identifying detail	Quarterly to the Project Execution Unit	Human Resources Representative

Case handling follows the confidential pathway of the Grievance Redress Mechanism (Section 8.4.12) and the SH/SEA/GBV Prevention and Response Plan (Section 8.4.9).

Food Safety and Zoonoses

This subsection addresses risks associated with food handling, preparation, and consumption, as well as the transmission of diseases from animals to humans. Ensuring safe food practices within worker camps and surrounding communities is critical to preventing outbreaks of foodborne illness and zoonotic infections. The plan emphasizes hygiene standards, monitoring of food supply chains, and awareness of zoonotic risks linked to livestock, pets, and wildlife. By integrating preventive measures and clear reporting pathways, the project safeguards both worker health and community well-being.

Table 147 presents the food safety and zoonoses measures.

Table 147***: Food safety and zoonoses measures***

Measure	Frequency	Responsible
Kitchen and food storage hygiene inspection	Weekly	Camp Manager
Cold chain temperature verification and logging	Daily	Catering supervisor
Sealed food waste storage with daily removal	Daily	Camp Manager
Integrated rodent control with bait station monitoring at the camp perimeter	Monthly	Pest control provider
Produce washing protocol for the vegetable garden, with night soil prohibited	Continuous	Camp Manager
Camp gastrointestinal illness rate monitoring	Daily recording, monthly review	Camp Manager

Emergency Preparedness and Community Interface

This component addresses a priority residual risk and is delivered together with the Camp Emergency Response Plan.

Table 148 presents the emergency preparedness and community interface measures.

Table** 148**: Emergency preparedness and community interface measures

Measure	Frequency	Responsible
Camp Emergency Response Plan defining emergency procedures, roles and responsibilities, communication protocols, evacuation routes, emergency contacts, training requirements and reporting procedures, and addressing fire in accommodation facilities, severe weather including hurricanes and flooding, wastewater or sewage releases, fuel and hazardous material spills, medical emergencies and disease outbreaks, and security incidents	Established before occupation, reviewed annually	Health, Safety and Environment Representative
Determination of elevation above sea level and the highest point, with establishment and mapping of evacuation routes	Before occupation	Health, Safety and Environment Representative
Evacuation drills with recorded participation	Quarterly	Camp Manager
Emergency contacts table completed, verified and displayed	Verified quarterly	Health, Safety and Environment Representative
Mutual notification arrangements with fire service, ambulance service and police	Established before mobilization, confirmed annually	Community Health Focal Point
Community notification protocol for incidents carrying off-site consequence	Within one hour of occurrence	Community Liaison Officer
Prohibition of smoking in dormitory rooms, cooking restrictions and prohibition of garbage burning	Continuous	Camp Manager
Emergency Response Form completed for every incident	Every incident	Health, Safety and Environment Representative

Health Service Coordination

Table 149 presents the health service coordination measures.

Table** 149**: Health service coordination measures

Measure	Frequency	Responsible
On-site first aid and primary care provision sufficient for routine	Continuous	Camp Manager

Measure	Frequency	Responsible
worker health needs		
Private medical arrangements for non-emergency worker care	Continuous	Human Resources Representative
Coordination with the receiving polyclinic and the Queen Elizabeth Hospital	Before mobilization, then quarterly	Community Health Focal Point
Recording of worker presentations to public health facilities	Monthly	Human Resources Representative
Review of whether Project demand is displacing community access	Quarterly	Community Health Focal Point
Emergency medical supplies available and accessible, with escalation to hospital where on-site supplies are inadequate	Continuous	Camp Manager

Where a community member is exposed to hazardous material, immediate medical attention is arranged.[121]

Health Promotion and Community Outreach

Table 150 presents the health promotion and community outreach measures.

Table 150***: Health promotion and community outreach measures***

Measure	Frequency	Responsible
Community health information sessions covering vector control, construction safety, reporting channels and works schedules	Before mobilization, then every six months	Community Liaison Officer
School engagement on road safety	Before mobilization, then each term	Community Liaison Officer
Health information materials in plain English, accessible to older residents and persons with disabilities	Distributed at each session	Community Liaison Officer
Regular communication of ongoing works and possible risks, including vector-borne risks, through radio, signage and direct notification	Monthly	Community Liaison Officer
Publication of works schedules enabling	Monthly	Community Liaison Officer

[121] Environmental Solutions Ltd., *Barbados Climate Resilient South Coast Water Reclamation Plant (BA-L1063), Updated Environmental and Social Impact Assessment and Environmental and Social Management Plan*, revised 16 April 2024. Community Health and Safety Management at section 9.7; community health concerns recorded in consultation at p. 221; vector-borne disease context at p. 97. (Environmental Solutions Ltd., 2024)

Measure	Frequency	Responsible
businesses and households to plan		
Controlled vendor engagement arrangements with transparent communication of access restrictions	Established before mobilization, reviewed quarterly	Community Liaison Officer
Wellbeing inquiry incorporated into engagement and complaint investigation	Continuous	Community Liaison Officer

Communication, Consultation and Grievance Interface

Community access to information and to a functioning complaint channel is a control measure in its own right and is required under Environmental and Social Performance Standard 10. This section establishes how health-related concerns enter the Project Grievance Redress Mechanism, how they are categorized, investigated and closed, and how consultation on health matters is conducted.

Three provisions carry particular weight. Health grievances alleging illness or injury are escalated immediately and investigated as incidents. Sensitive complaints concerning sexual exploitation and abuse, sexual harassment, gender-based violence and child protection follow a separate confidential channel and are excluded from the general log. Channels must be usable by persons who cannot read, cannot travel, or have concerns about identification, with anonymous submission available and operational.

Proactive community health and safety communication is essential and includes advance notification of disruptive/high-risk activities and communication following significant incidents. The Project will maintain an ongoing program of community health and safety communication to ensure that communities receive timely, accurate and accessible information regarding Project activities that may affect health, safety, mobility, access to services, or community wellbeing. Table 151 shows triggers/events, primary stakeholders, communication actions and responsibilities.

Table** 151**: Community Health and Safety Communication Triggers and Responsibilities

Trigger/Event	Primary Stakeholders	Communication Requirement	Responsible Person	Indicative Timeframe	Escalation Requirement
Planned road closure, traffic diversion or major traffic management change	Residents, businesses, schools, healthcare facilities, emergency services	Advance notification describing location, duration, alternative routes and safety precautions	Social Personnel with Contractor Site Representative	Minimum 48–72 hours before implementation, where practicable	Escalate to Project Execution Unit if disruption exceeds planned duration or affects emergency access
Planned high-risk or	Nearby residents,	Advance notification of	Community Health Focal Point and	Prior to commencement	Escalate significant

Trigger/Event	Primary Stakeholders	Communication Requirement	Responsible Person	Indicative Timeframe	Escalation Requirement
disruptive activity	businesses, vulnerable groups	activity, duration, anticipated impacts and mitigation measures	HSE Representative	of activity	concerns through Project Execution Unit
Odor or H_2S event affecting the community	Nearby residents, businesses, schools, healthcare facilities	Immediate notification where there is potential community exposure, including precautionary measures and contact details	HSE Representative	As soon as practicable following confirmation of the event	Immediate notification to Project Execution Unit; emergency response procedures activated where required
Wastewater overflow, uncontrolled discharge or sewage-related incident	Residents, businesses, schools, healthcare facilities, regulatory agencies	Notification of affected areas, health precautions, restrictions and response actions	HSE Representative and Community Health Focal Point	As soon as practicable after incident identification	Immediate escalation to Project Execution Unit and relevant authorities
Community health-related monitoring exceedance	Potentially affected communities and facilities	Communication of exceedance, implications, corrective actions and follow-up monitoring	HSE Representative	Within 24 hours of confirmation where a community health impact may occur	Escalation to Project Execution Unit and management review
Community emergency requiring protective action	All affected stakeholders	Emergency communication including protective instructions and emergency contact information	Incident Controller/Project Manager	Immediate	Managed through emergency response and incident management procedures
Significant incident causing injury, illness, evacuation, loss of service or widespread public	Affected communities, authorities and other stakeholders as appropriate	Initial factual notification followed by updates as information becomes available	Project Manager supported by Community Health Focal Point	Initial communication as soon as practicable; subsequent updates as required	Escalation to Project Execution Unit and regulatory authorities in accordance with reporting

Trigger/Event	Primary Stakeholders	Communication Requirement	Responsible Person	Indicative Timeframe	Escalation Requirement
concern					requirements
Receipt of multiple similar community complaints indicating an emerging health or safety issue	Affected community members	Communication of findings, corrective actions and opportunities for feedback	Social Personnel and Community Health Focal Point	Following preliminary investigation	Escalation to Grievance Redress Committee and Project Execution Unit where systemic issues are identified

Information shall be communicated through channels appropriate to local circumstances, which may include community meetings, notices, flyers, local media, social media platforms, direct stakeholder contact, and communication through community representatives. Materials shall be presented in language and formats accessible to vulnerable and disadvantaged groups. Communication activities will target affected stakeholder groups using methods appropriate to their needs and circumstances. Key stakeholder groups include:

- Residents located adjacent to works areas, haul routes and treatment facilities.
- Businesses and commercial operators that may be affected by access restrictions, traffic changes or service interruptions.
- Schools, childcare facilities and educational institutions located within the area of influence of Project activities.
- Healthcare facilities, pharmacies and emergency service providers.
- Community organizations and local authorities.
- Vulnerable groups, including women, girls, boys, men, youth, older persons, PWDs, migrants, informal workers, and female-headed households.

Communication methods may include public meetings, community briefings, door-to-door notification, information leaflets, posted notices, website and social media updates, local radio announcements, stakeholder liaison meetings, direct telephone contact and electronic messaging services. Selection of methods shall be based on the affected population, urgency of the information and accessibility requirements.

Information communicated to stakeholders shall be clear, accurate and understandable and shall, where relevant, describe:

- The nature and duration of the activity or issue.
- Potential health and safety risks.
- Expected disruptions or restrictions.

- Measures implemented to reduce risks and impacts.
- Actions required by community members, where applicable.
- Contact details for obtaining information or lodging complaints.

The Community Health Focal Point, supported by the Social Personnel and the Health, Safety and Environment Representative, shall be responsible for coordinating community health and safety communications. For incidents, emergencies or monitoring exceedances, communication shall be coordinated with the Project Execution Unit and relevant regulatory authorities as required.

Where a significant community health and safety incident occurs, or where an incident gives rise to substantial public concern, the Project shall provide timely communication to affected communities and relevant stakeholders. Communications should describe the nature of the event, known and potential consequences, immediate protective measures, actions taken by the Project to manage risks, and available channels for obtaining further information. Follow-up communications should be provided as new information becomes available and when corrective or preventive actions have been implemented.

Health-Related Grievances

Community health grievances enter through the Project Grievance Redress Mechanism. The following requirements apply in addition to standard handling.

Health-related grievances are categorized using the categories established in the Grievance Redress Mechanism, Table 152, which already provides the category set, the primary focal point and the escalation pathway for each.[122] This Program adds no separate category scheme. The correspondence between the health pathways assessed at Section 6 and the existing categories is as follows.

Table** 152**: Correspondence between health pathways and Grievance Redress Mechanism categories

Health pathway	Grievance Redress Mechanism category	Primary focal point
CH-01 Vector-borne disease	Occupational Health; Environmental Impacts	HR and HSE; HSE Representative
CH-02 Particulates and respiratory health	Environmental Impacts	HSE Representative
CH-03 Odor, hydrogen sulfide, bioaerosols	Occupational Health; Environmental Impacts	HR and HSE; HSE Representative
CH-04 Noise, vibration, sleep disruption	Worker Influx and Community; Environmental Impacts	Community Liaison Officer; HSE Representative
CH-05 Water, sanitation, gastrointestinal illness	Emergency and Safety; Environmental Impacts	HSE Representative

[122] China Railway Shanghai Engineering Group Co., Ltd., *Grievance Redress Mechanism*, draft incorporating inputs of 7 August 2026. Grievance redress process for general grievances at section 5, Steps I to VI; grievance categories, focal points and escalation pathways at section 5.1, Table 1; specific procedures for workers and for gender-based violence, sexual exploitation and abuse and sexual harassment grievances at section 6; record keeping and monitoring at section 6.5; communication and awareness at section 6.6. (China Railway Shanghai Engineering Group Co., Ltd., 2026)

Health pathway	Grievance Redress Mechanism category	Primary focal point
CH-06 Road traffic injury	Traffic and Mobility	Social Personnel
CH-07 Communicable disease and labor influx	Occupational Health; Worker Influx and Community	HR and HSE; Community Liaison Officer
CH-08 Sexual exploitation and abuse, sexual harassment, gender-based violence	SEA/SH/GBV	HR Representative, survivor-centered team
CH-09 Food safety and zoonoses	Occupational Health; Labor and Welfare	HR and HSE; HR Representative
CH-10 Emergency, disaster and climate events	Emergency and Safety	HSE Representative
CH-11 Health service capacity displacement	Labor and Welfare	HR Representative
CH-12 Wellbeing and livelihood loss	Worker Influx and Community; General Conduct	Community Liaison Officer; Site Supervisors

Sexual exploitation and abuse, sexual harassment and gender-based violence complaints, together with child protection matters, follow the confidential channel and are excluded from the general log.

Timeframes and process follow the Grievance Redress Mechanism without variation.[123]

This Program adds one health-specific provision to that process. Any grievance alleging illness or injury attributable to the Project is escalated immediately to the Health, Safety and Environment Representative and the Community Health Focal Point on receipt, investigated as an incident under Section 8.4.14, and reported to the Project Execution Unit, in place of the standard Tier 1 timeline. Grievances are recorded on the standard Grievance Redress Mechanism form.

Channels are accessible to persons who cannot read, cannot travel, or have concerns about identification, and anonymous submission is available and operational.

Consultation

Public consultation on the Environmental and Social Impact Assessment documentation is held before commencement of works, with health content presented in accessible form. Consultation logistics follow the arrangements established for the Project, covering scheduling, venue reservation, written and oral invitations, materials, attendance records, and preparation of a Public Consultation Report annexed to the Environmental and Social Impact Assessment and Management Plan, with suggestions

[123] China Railway Shanghai Engineering Group Co., Ltd., *Grievance Redress Mechanism*, draft incorporating inputs of 7 August 2026. Grievance redress process for general grievances at section 5, Steps I to VI; grievance categories, focal points and escalation pathways at section 5.1, Table 1; specific procedures for workers and for gender-based violence, sexual exploitation and abuse and sexual harassment grievances at section 6; record keeping and monitoring at section 6.5; communication and awareness at section 6.6. (China Railway Shanghai Engineering Group Co., Ltd., 2026)

incorporated into the final document and publication on the Barbados Water Authority and Inter-American Development Bank websites.[124]

Health findings in this Assessment are validated with affected residents through the consultation scheduled at Section 15, with separate arrangements to hear from women, older persons and persons with disabilities.

Consultation is supplemented by ongoing community engagement during Project implementation. Community health and safety information shall be communicated throughout the works period rather than solely during formal consultation events. Feedback received through routine engagement activities, community meetings, stakeholder discussions, health-related inquiries and grievances shall be reviewed periodically to identify emerging concerns and opportunities for improvement of community health and safety measures.

Records will be maintained of notifications issued, consultation activities undertaken, issues raised by stakeholders, commitments made by the Project, and actions taken in response. Information generated through monitoring, incident investigations and grievance analysis shall be used to adapt communication approaches and consultation priorities over the life of the Project.

Training and Capacity Building

Training is the mechanism through which the commitments in Section 11 reach the individuals whose conduct determines whether they are met. This section sets out the community health training requirement across six audiences, from the workforce as a whole to community members themselves.

The requirement operates within the Contractor's wider Safety Education and Training Plan, which establishes a three-tier pre-job structure applied to all incoming personnel before site access is granted.[125] Project-level training of four hours covers Barbados health, safety and environment regulations, emergency response procedures and evacuation routes, environmental protection requirements, gender-based violence, and prevention of communicable and occupational diseases. Crew-level training of four hours covers hazard identification, safe operating procedures, correct use of personal protective equipment and basic first aid. Position-level training of two hours covers job-specific risks. Each tier requires a post-training assessment, and personnel who do not pass are prohibited from entering the worksite.[126]

Three features of that structure carry community health significance. Gender-based violence and communicable disease prevention are already embedded at project level and reach every person

[124] Fajardo, S., *Environmental Report No. 004, Revision 02: Review of CRSEG ESIA/ESMP for Workers' Campsite Version 2B*, South Coast Water Reclamation Project Environmental Management System, reference SCWRP-EMS-ER-002, issued 10 July 2026, approved 22 July 2026. Omission of noise and ecosystem services from the environmental baseline at item 4, p. 1; naming of Graeme Hall Swamp at item 10, p. 2; water sampling methodology at items 19 to 21, pp. 4 to 5; identification and prioritization of ecosystem services at item 23, p. 6; impact rating methodology and risk level interpretation at items 31 to 34, pp. 8 to 9; waste definitions and categories at item 43, p. 12; consultation logistics at item 49, p. 13; field work representativeness at item 50, p. 14. (Fajardo, 2026)

[125] China Railway Shanghai Engineering Group Co., Ltd., *Safety Education and Training Plan*, 2026. Three-tier pre-job training structure at section I.1, including the Training Plan Table for pre-job three-tier training; specialized training requirements at section I.2; daily toolbox talks and monthly themed sessions at section I.3; site conduct requirements at section II.1.1. (China Railway Shanghai Engineering Group Co., Ltd., 2026)

[126] China Railway Shanghai Engineering Group Co., Ltd., *Safety Education and Training Plan*, 2026. Three-tier pre-job training structure at section I.1, including the Training Plan Table for pre-job three-tier training; specialized training requirements at section I.2; daily toolbox talks and monthly themed sessions at section I.3; site conduct requirements at section II.1.1. (China Railway Shanghai Engineering Group Co., Ltd., 2026)

entering the site, which provides the delivery route for the community-facing content at Section 8.4.10. Assessment is mandatory and failure excludes a worker from site, so community health obligations are enforceable at induction. Training records comprising attendance registers, assessment papers, score summaries and photographic evidence are retained as compliance documentation, and these satisfy the disaggregated reporting required under the contractual metrics.[127]

Daily toolbox talks are maintained without exception and monthly themed sessions are adjusted to reflect works progress, including seasonal topics during the rainy season.[128] These provide the vehicle for reinforcing vector control during wet-season breeding conditions and traffic discipline during periods of intensive haulage.

The community health training requirement is as follows.

Table 153 presents the training program.

Table 153***: Training program***

Audience	Content	Frequency	Records
All workers	Community health obligations; vector control; waste discipline; traffic controls and school zones; Code of Conduct community provisions; use of the grievance mechanism including anonymous reporting	Induction before site access, with quarterly refresher	Attendance register, disaggregated and reported to the Project Execution Unit
Drivers	Route restrictions, school-hour prohibitions, speed limits, pedestrian awareness, community conduct	Before first movement, refresher every six months	Driver competency record
Supervisors and foremen	Recognition and immediate reporting of community-affecting incidents; complaint handling; supervisory accountability for worker conduct	Before appointment, then annually	Competency record
Catering staff	Food hygiene, cold chain, waste handling, illness reporting	Before engagement, then every six months	Certification record
Health, safety and environment and community liaison personnel	Community health monitoring methods; incident investigation; survivor-centered handling	Before appointment, then annually	Training record
Community members	Vector source reduction; construction safety; reporting channels; conduct expectations of	Before mobilization, then every six months	Session record

[127] China Railway Shanghai Engineering Group Co., Ltd., *Safety Education and Training Plan*, 2026. Three-tier pre-job training structure at section I.1, including the Training Plan Table for pre-job three-tier training; specialized training requirements at section I.2; daily toolbox talks and monthly themed sessions at section I.3; site conduct requirements at section II.1.1. (China Railway Shanghai Engineering Group Co., Ltd., 2026)

[128] China Railway Shanghai Engineering Group Co., Ltd., *Safety Education and Training Plan*, 2026. Three-tier pre-job training structure at section I.1, including the Training Plan Table for pre-job three-tier training; specialized training requirements at section I.2; daily toolbox talks and monthly themed sessions at section I.3; site conduct requirements at section II.1.1. (China Railway Shanghai Engineering Group Co., Ltd., 2026)

Audience	Content	Frequency	Records
	workers		

Training is delivered in languages understood by participants. Written material for the workforce is provided in Standard Chinese and English, spoken delivery is provided in the spoken varieties confirmed under verification action BV-12 with interpretation where required, and community sessions are conducted in accessible plain English.[129] Records specify frequency type, distinguishing induction from refresher, and are available for inspection as stipulated by the Labor Laws of Barbados. Training structure and trainer competency are shared with the Project Execution Unit before each training exercise.[130] Daily toolbox talks reinforce key risks, lessons from incidents and complaints, and expectations for respectful engagement with community members.[131]

8.4.10.2. Monitoring, Indicators and Reporting

Monitoring converts the commitments into evidence. This section establishes twenty-one key performance indicators, set out at Table 154, together with the reporting cycle at Table 155.

Indicators are drawn directly from the Program components, and each specifies a measurement method, a target, a responsible role and a frequency, addressing the requirement that monitoring identify who, what, where, when and how. Indicators fall into three groups. Compliance indicators measure whether a specified control was applied, such as elimination of breeding sites within 24 hours or the absence of heavy vehicle movements in restricted school-hour windows. Outcome indicators measure the environmental or health result, such as exceedances at community receptors or camp illness rates. Process indicators measure delivery of the supporting program, including training, drills, grievance closure and completion of baseline verification.

Reporting is structured to feed the contractual environmental, social, health and safety metrics and is disaggregated by gender where the metric permits.

[129] BrinsJen Systems Development Specialists, *The Workers' Code of Conduct of China Railway Shanghai Engineering Group*, Version 2.0, July 2026. Alignment with IDB Performance Standards at section 1; child protection and the Labor Laws Chapter 346 definition at section 4.5; health and safety requirements and the Safety and Health at Work Act at section 4.6; compliance with laws at section 5; data protection at section 5.5; training and language requirements at section 8.6; the Community Liaison Officer role at section 3.3.1. (BrinsJen Systems Development Specialists, 2026)

[130] BrinsJen Systems Development Specialists, *The Workers' Code of Conduct of China Railway Shanghai Engineering Group*, Version 2.0, July 2026. Alignment with IDB Performance Standards at section 1; child protection and the Labor Laws Chapter 346 definition at section 4.5; health and safety requirements and the Safety and Health at Work Act at section 4.6; compliance with laws at section 5; data protection at section 5.5; training and language requirements at section 8.6; the Community Liaison Officer role at section 3.3.1. (BrinsJen Systems Development Specialists, 2026)

[131] BrinsJen Systems Development Specialists, *Workers' Camp Environmental and Social Impact Assessment and Environmental and Social Management Plan*, Version 2B, prepared for China Railway Shanghai Engineering Group Co., Ltd., 2026. Community Health and Safety Plan at pp. 270 to 274; campsite occupancy and layout at p. 37; nearest residential receptor at p. 5; air quality sampling parameters and locations at p. 121; demographic profile at p. 292; language and labor force data at p. 294; schools identified at pp. 292 and 335. (BrinsJen Systems Development Specialists, 2026)

Key Performance Indicators

Table** 154**: Community health key performance indicators

Reference	Indicator	Measurement method	Target	Responsible	Frequency
KPI-01	Vector breeding sites identified and eliminated within 24 hours	Inspection record	100 percent	Camp Manager	Weekly
KPI-02	Vector index relative to established baseline	Larval and adult survey	No increase above baseline	Vector control provider	Monthly
KPI-03	Exceedances of particulate matter guideline values at community receptors	Continuous monitoring log	Zero	Health, Safety and Environment Representative	Monthly
KPI-04	Visible dust migration beyond the site boundary	Daily inspection	Zero events	Health, Safety and Environment Representative	Daily
KPI-05	Hydrogen sulfide alarm exceedances	Continuous monitoring	Zero	Health, Safety and Environment Representative	Monthly
KPI-06	Odor complaints received and closed within seven days	Grievance log	Downward trend, 100 percent closed	Community Liaison Officer	Monthly
KPI-07	Noise exceedances at residential and school boundaries against World Health Organization Community Noise Guideline values	Monitoring record	Zero exceedances	Health, Safety and Environment Representative	Monthly
KPI-08	Effluent and receiving water compliance	Laboratory results	100 percent compliant	Health, Safety and Environment Representative	Monthly
KPI-09	Potable water compliance at camp point of use	Laboratory results	100 percent compliant	Health, Safety and Environment Representative	Monthly

Reference	Indicator	Measurement method	Target	Responsible	Frequency
KPI-10	Heavy vehicle movements within restricted school-hour windows	Movement log audit	Zero	Health, Safety and Environment Representative	Weekly
KPI-11	Speed compliance on the community access route	Audit record	100 percent	Health, Safety and Environment Representative	Weekly
KPI-12	Traffic incidents and pedestrian near-misses involving Project vehicles	Incident register	Zero	Health, Safety and Environment Representative	Immediate and monthly
KPI-13	Camp illness presentations per 100 occupants	Camp health record	Below outbreak threshold	Camp Manager	Monthly
KPI-14	Suspected outbreaks notified to the Ministry of Health within 24 hours	Notification record	100 percent	Community Health Focal Point	Per event
KPI-15	Workers inducted on community health obligations before site access	Training register	100 percent	Health, Safety and Environment Representative	Monthly
KPI-16	Community health grievances closed within target time	Grievance log	90 percent or above	Community Liaison Officer	Monthly
KPI-17	Cases received and resolution times under the confidential channel, without identifying detail	Confidential register	Response within protocol	Human Resources Representative	Quarterly
KPI-18	Emergency drills completed against schedule	Drill record	100 percent	Camp Manager	Quarterly
KPI-19	Emergency contacts table complete and verified	Verification record	100 percent	Health, Safety and Environment Representative	Quarterly
KPI-20	Community health outreach and consultation sessions delivered against	Session records	100 percent	Community Liaison Officer	Per schedule

Reference	Indicator	Measurement method	Target	Responsible	Frequency
	schedule				
KPI-21	Baseline verification actions completed	Verification register at Section 5.7	100 percent by the scheduled date	Community Health Focal Point	Monthly until complete

Reporting

Table** 155**: Reporting schedule

Report	Content	Recipient	Frequency
Daily inspection record	Particulates, waste, standing water, traffic control, road condition	Internal	Daily
Monthly community health report	All indicators; grievance analysis by category; incidents; corrective actions; baseline verification status	Project Execution Unit	Monthly
Quarterly progress report	Community health section integrated with contractual environmental, social, health and safety metrics	Project Execution Unit and Inter-American Development Bank	Quarterly
Incident report	Any incident carrying actual or potential community health consequence	Project Execution Unit within 24 hours, full report within five working days	Per event
Outbreak notification	Suspected communicable disease outbreak	Ministry of Health within 24 hours, Project Execution Unit concurrently	Per event
Annual Program review	Effectiveness assessment, trend analysis, revision recommendations	Project Execution Unit and Inter-American Development Bank	Annually

Reporting is disaggregated by gender where the metric permits, consistent with contractual reporting requirements.[132]

Corrective Action and Adaptive Management

While monitoring under Section 14 produces findings only if those findings alter practice, this section provides practical implications and next steps to establish what happens when a control fails, a complaint is received, or an incident occurs.

Section 14 establishes what is measured, by whom and how often. This section establishes what happens next. The indicators, inspections and grievance records described there generate findings continuously through construction, and those findings carry value only where they trigger a defined response. The arrangements below convert a monitoring result, a complaint or an incident into an investigation, a corrective action with a named owner, and a verified closure, and they identify the circumstances in which work stops while that process runs.

[132] *Standard Bidding Document for Design and Build of Civil Works*, Barbados Climate Resilient South Coast Water Reclamation Project: Section V Bidding Forms, including Form ESHS, Form CCESHS and Form LSER; Section VI Employer's Requirements, Environmental, Social, Health and Safety Requirements, listing the required management plans and the minimum content for the Contractor ESHS Framework and Code of Conduct; Section VIII Particular Conditions of Contract, Part C, ESHS metrics for progress reports, and Part D, Contractor's Code of Conduct. (Standard Bidding Document for Design and Build of Civil Works: Barbados Climate Resilient South Coast Water Reclamation Project, n.d.)

It sets out a six-stage corrective action process from detection through to verified closure, the circumstances in which work is suspended pending investigation, and the conditions under which the Program itself is revised. The work stoppage triggers at Section 8.5.4 correspond to the escalation points identified in the Program components and represent the threshold at which continued operation would present ongoing exposure.

Corrective Action Process

Detection occurs through monitoring, inspection, grievance, incident or external notification. Immediate control suspends the causal activity where continued operation presents ongoing exposure. Investigation is completed within 48 hours for health complaints and within 24 hours for incidents involving injury or potential outbreak, addressing immediate causes, underlying causes, and whether work methods, traffic arrangements, camp management, stakeholder communication or emergency preparedness require change.[133] Corrective and preventive actions are documented with a named owner and completion date. Closure is confirmed by the Health, Safety and Environment Representative, with effectiveness verified at the next monitoring cycle. Reporting follows Section 13.2, with serious matters reported to the Project Execution Unit immediately.

Work Stoppage Triggers

Work is suspended pending investigation where visible dust migrates beyond the boundary toward a residential or school receptor; where hydrogen sulfide exceeds the alarm threshold at a monitored location; where a pedestrian near-miss occurs involving a Project vehicle; where a wastewater or chemical release carrying community exposure potential occurs; where a suspected communicable disease outbreak is identified within the worksites; or where a heavy vehicle transits the community during a restricted school-hour window.

Adaptive Management

The Program is revised where monitoring shows a control to be ineffective, where grievance trends indicate an unaddressed pathway, where an incident reveals a gap, where Project scope or schedule changes materially, or where completion of baseline verification alters the assessed significance of an impact. Revisions are recorded in the document control table and notified to the Project Execution Unit.

8.4.10.3. Protection of Neighboring Farms, Agricultural Livelihoods and Private Property

These measures are aimed at preventing Project-related activities and worker conduct from causing unauthorized access to neighboring agricultural land, praedial larceny, damage to crops or other property, disruption of farming activities, intimidation of landowners, or deterioration in relationships between the Project workforce and affected communities.

These measures apply to the upgrading of the South Coast Sewage Treatment Plant (SCSTP), construction of the South Coast Water Reclamation and Re-use Facility (SCWRRF), the Workers' Campsite and associated access routes and temporary work areas.

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[133] BrinsJen Systems Development Specialists, *Workers' Camp Environmental and Social Impact Assessment and Environmental and Social Management Plan*, Version 2B, prepared for China Railway Shanghai Engineering Group Co., Ltd., 2026. Community Health and Safety Plan at pp. 270 to 274; campsite occupancy and layout at p. 37; nearest residential receptor at p. 5; air quality sampling parameters and locations at p. 121; demographic profile at p. 292; language and labor force data at p. 294; schools identified at pp. 292 and 335. (BrinsJen Systems Development Specialists, 2026)

8.4.10.3.1 Preventive Measures

The Contractor shall implement the following measures throughout construction and other relevant Project activities:

1. **Boundary demarcation and access control.** Clearly identify the approved Project boundary, authorized work areas, vegetation-clearing limits and designated access routes. Use appropriate signage, maps, fencing or route markers to make the boundaries visible to workers and supervisors.
2. **Protection of agricultural property.** Prohibit workers from entering neighboring farms, agricultural plots or private property without authorization. Workers shall not use such property as shortcuts, gathering places or recreational areas.
3. **Control of vegetation clearing and land disturbance.** Ensure that all clearing, excavation and related activities remain within the approved work areas and authorized limits. Before work begins, supervisors shall verify the applicable boundaries and communicate them to the work crews. Any uncertainty about the permitted extent of work shall be referred to the responsible supervisor before the activity proceeds.
4. **Supervision of workforce movement.** Supervisors shall know where their crews are working and ensure that personnel remain within approved areas during working hours. Movement to and from the campsite and other Project locations shall be managed to protect neighboring farms and private property.
5. **Protection of crops, livestock and equipment.** Workers shall not take, harvest, consume, remove or damage crops, fruit, livestock, farming equipment or any other property belonging to farmers, residents, the Government or other third parties. Workers shall not interfere with agricultural operations or assume that an unattended item or crop is available for use.
6. **Community interaction.** Workers shall treat farmers and other community members respectfully. Disputes concerning access, boundaries or property shall be referred to the designated supervisor or Community Liaison Officer. Workers shall not threaten, intimidate or retaliate against complainants or witnesses.

8.4.10.3.2. Incident Reporting and Response

Any suspected or actual incident involving praedial larceny, trespass, crop or property damage, unauthorized vegetation clearing, intimidation or conflict with a neighboring landowner shall be reported immediately to the designated supervisor and through the GRM. The Contractor shall notify the PEU without delay.

The Contractor shall coordinate with the PEU and the designated social personnel to assess the incident, engage affected parties where appropriate, determine and implement corrective measures, and monitor those measures to completion. Where the incident indicates weaknesses in supervision, access arrangements, boundary demarcation, worker awareness or community communication, the relevant procedures shall be reviewed and strengthened.

Complaints shall be handled fairly, confidentially where appropriate and without retaliation. The Contractor shall not discourage complaints or require affected persons to resolve incidents privately with individual workers. Suspected criminal conduct shall be referred to the competent authorities as appropriate.

8.4.10.3.3. Responsibilities and Monitoring

The Project Manager shall ensure that sufficient resources and management oversight are provided to implement these measures. Site supervisors shall be responsible for day-to-day compliance with boundary restrictions, access arrangements and worker-conduct requirements. The Community Liaison

Officer shall facilitate communication with affected farmers and other community members, while the designated social and environmental personnel shall support incident assessment, corrective action and monitoring.

The Contractor shall maintain records of complaints, reported incidents, investigation findings, corrective actions, responsible persons and completion dates. Serious incidents shall be escalated to the PEU without delay. Lessons learned shall inform refresher training, toolbox talks and revisions to the Code of Conduct and relevant management procedures.

Effectiveness shall be assessed through site inspections, review of complaints and incident records, verification of boundary controls, and monitoring of the timely completion of corrective actions. Any recurrence or evidence of ineffective controls shall trigger a review of the measures and strengthened supervision.

8.4.11. Stakeholder Engagement Plan (SEP)

Overview

Social engagement plans are powerful tools that promote civic engagement and facilitate productive stakeholder and community/local advancement. The foundation of social or stakeholder engagement lies in the principle that “those groups capable of influencing or being influenced by an organization’s objectives” should have the chance to provide feedback and contribute to decisions that impact them *(Jeffery, 2009)*.

Based on the principle mentioned above, this Stakeholder Engagement Plan has been prepared by China Railway Shanghai Engineering Group Co., Ltd. with SAEDI Consulting (Barbados) Inc., as part of the Terms of Reference requirements for the Barbados Climate Resilient South Coast Water Reclamation Project. It sets out the engagement process for the design, construction and operation phases of the treatment plant upgrade and the reclamation facility, together with the workers' campsite that serves both. It will be updated by the project team as necessary through the life cycle of the Project. The full Stakeholder Engagement Plan for the project, including stakeholder identification and analysis disaggregated by group, gender-sensitive and inclusive engagement methods, the engagement calendar by project phase, and disclosure and feedback arrangements, is issued as a companion document and is cross-referenced in Table 189.

Purpose of the SEP

The overall purpose of the SEP is to ensure that a consistent, comprehensive, and coordinated approach is taken for social engagement and project disclosure throughout the project. It is further intended to demonstrate the commitment of the project principals - the Barbados Water Authority and China Railway Shanghai Engineering Group Co., Ltd., whereby China Railway Shanghai Engineering Group Co., Ltd., in the capacity of project contractors, is the main implementing party, and the Barbados Water Authority, in the capacity of the Client, will ensure an ‘international good practice’ approach to engagement. The project team is committed to full compliance with all Barbados laws and regulations, as well as aligning to international standards such as the Inter- American Development Bank Environmental and Social Safeguards. The Stakeholder Engagement Plan operates throughout the life of the project and not only during preparation of this assessment. It supports engagement during construction and operation, provides the route by which stakeholders are informed of monitoring results and of progress against the

management commitments in this document, and records stakeholder feedback so that it can be considered in project decisions.

In keeping with good international practice, the SEP aims to ensure that stakeholder engagements are conducted in a timely and relevant manner, providing pertinent and accessible information. In this regard, the SEP seeks to ensure that stakeholders are given sufficient opportunity to express their opinions and concerns and that these concerns receive adequate consideration in project decisions.

The SEP provides the project's approach to stakeholder engagement. It identifies the main categories of stakeholders and how they influence and will be engaged in the SIA process. It also identifies the ways to document engagement undertaken throughout the project's life cycle.

Objective of the SEP

The Project's SEP has four principal objectives for engaging stakeholders during the SIA process. They are as follows:

- **Ensuring Understanding:** This is key to foster an open, inclusive, and transparent process of dialogue/communication and information sharing in a culturally appropriate manner. It will recognize various categories of stakeholders who require specific forms of communication, including women, men, youth, older persons, persons with disabilities, migrant workers and other groups who may be less able to participate, have different information needs and face different barriers to participation. Communication methods, venues and timing will be adapted accordingly, and the arrangements for doing so are set out in the Stakeholder Engagement Plan recorded in Table 189. Information regarding engagements will be disclosed as early and as comprehensively as possible.
- **Involving Stakeholders in the Assessment:** To include and garner stakeholder views in the scoping phase, identification of issues, the assessment of impacts, and management/mitigation measures. Stakeholders will be able to provide their input by detailing local knowledge and information for the social baseline, informing the social impact assessment.
- **Managing Expectations:** It is important to ensure that the Project does not create, nor allow unrealistic expectations to develop among the stakeholders regarding potential project benefits. The engagement process will serve as a mechanism for understanding and managing stakeholder and community expectations by disseminating accurate information in a relatable and understandable manner.
- **Ensuring Compliance:** The process is designed to ensure compliance with local regulatory requirements and good international practices. In addition, it is intended to build good social relationships as a good practice of socially responsible entities.

Scope and Structure of the SEP

The scope is defined as the extent of the area over which any activity operates or is effective, and the range of applications or subjects embraced, which is relevant *(Oxford English Dictionary, 2023)*. Therefore, this SEP, which covers Graeme Hall within the Project area, gives general guidance on how to involve the stakeholders within this defined project area, in all phases of the project.

Legal Framework Guiding the SEP

The SEP has been prepared to ensure compliance with Barbados legislative requirements, as well as international good practices as defined by the Inter-American Development Bank. This section presents the relevant Barbadian legislation and international standards that will guide the project's stakeholder engagements.

National legislative framework

The key National Legislative Framework relevant to the Project, which guides the SEP process, is the Planning and Development (Environmental Impact Assessment) Regulations, 2021.

The Data Protection Act, 2019-29 applies to stakeholder engagement under this Plan. Personal information collected through attendance registers, grievance records, contact databases and consultation feedback is personal data within the meaning of the Act. It is collected for the specified purpose of project engagement, held securely, used only for that purpose, and disclosed to third parties only where the individual has consented or where disclosure is required by law. Records containing personal information relating to sexual harassment, sexual exploitation and abuse or gender-based violence are held on the separate confidential register described in the Grievance Redress Mechanism and are accessible only to designated officers.

International standards

This social engagement plan (SEP) will be informed by Inter-American Development Bank Environmental and Social Performance Standards, specifically ESPS 10 Stakeholder Engagement and Information Disclosure.

This ESPS recognizes the importance of open and transparent engagement between the Borrower and stakeholders, especially project-affected people, as a key element that can improve the environmental and social sustainability of projects, enhance project acceptance, and contribute significantly to the project’s successful development and implementation. This ESPS is consistent with the objective of implementing the rights of access to environmental information, public participation in the environmental decision-making process, and access to justice in environmental matters (Bank I.-A. D.).

Stakeholder identification and analysis

Stakeholder Identification and analysis is an essential component of effective and meaningful stakeholder engagement activities. The objective of this process is to provide a general overview of all stakeholders and their level of engagement with the project. The Stakeholder Engagement Assessment Matrix is a project management technique to document desired engagements and monitor actual engagement levels of stakeholders. It helps identify potential gaps in the involvement of stakeholders (Project-Management.info, 2024). Please see the *Stakeholder Assessment Matrix* and *Stakeholder Influence Matrix* below.

Stakeholder assessment matrix

Table** 156**: Stakeholder Assessment Matrix

Stakeholders	**Stakeholder Impact (Level of impact the project has on the stakeholder)**	**Influence (level of influence the stakeholder has on the project)**	**What is important to Stakeholder**	**How can the Stakeholder Contribute / Influence the project**	**Engagement Strategy**
Government Agencies					
Barbados Water Authority	High	High	Establishing the scope of the project. Ensuring the Project is undertaken following the regulations of Barbados. Ensuring credibility of the information assessed. Ensuring the project keeps its timeline	Terminating the project on behalf of the Government of Barbados	Early and continuous engagement throughout the life cycle of the project, submitting reports in a timely manner, discussions of any changes with the technical teams. bi-weekly, monthly meetings and report
Ministry of Agriculture, Food and Nutritional Security	High	Project Beneficiary	Ensuring the Project serves the Government of Barbados' Needs Aligns with National Agriculture Plans Ensure Key populations (for example Small Farmers are consulted)	C connect the project to the agriculture eco system serve a medium to transmit communications Help in the organization of meetings with key stakeholder groups	Continuous engagement
Ministry of People Empowerment and	Medium	Secondary stakeholder	Wellbeing of key population within	Provide secondary information on Gender needs	P eriodic engagement to appraise the stakeholder about

Stakeholders	Stakeholder Impact (Level of impact the project has on the stakeholder)	Influence (level of influence the stakeholder has on the project)	What is important to Stakeholder	How can the Stakeholder Contribute / Influence the project	Engagement Strategy
Elder Affairs			communities within project Area of Influence	and baseline information to inform social impact and migration of the project	project development for example Consultation and disclosure meetings
Ministry of Youth, Sports and Community Empowerment	Medium	Secondary stakeholder	Wellbeing of key population within communities within project Area of Influence	Provide secondary information on youth needs and baseline information to inform social impact and migration of the project	P periodic engagement to appraise the stakeholder about project development for example Consultation and disclosure meetings
Member of Parliament (Graeme Hall	High	Community Representative	Ensuring the Project serves the Government of Barbados' Needs Aligns with National goals Ensure Key populations (for example community / constituency members)	Fail to support public consultation process, resulting in community members developing apathy toward the project	C continuous engagement by email, in person sessions (with advance notice of sessions provided) and text message
Barbados Power and Light	High	Utility Provider	Ensuring the project is able to keep its timeline protecting its utility	C ordination with contractor to ensure the project can keep	P periodic communication and coordination meetings

Stakeholders	Stakeholder Impact (Level of impact the project has on the stakeholder)	Influence (level of influence the stakeholder has on the project)	What is important to Stakeholder	How can the Stakeholder Contribute / Influence the project	Engagement Strategy
			infrastructure maintaining its corporate image and trust of consumers	its civil works schedule	
Main Project Parties					
Inter-American Development Bank	High	Funders	E ensure the project complies with Local Legislation and Funders ESPF Ensure the project meets it timeline Ensure the project has the appropriate social and environmental safeguards Monitoring the project performance	Terminating the project on behalf of the Government of Barbados as the project financiers	Early and continuous engagement throughout the life cycle of the project, submitting reports in a timely manner, discussions of any changes with the technical teams. bi-weekly, monthly meetings and report
Project Engineer / Contractor	High	Project Implementation and execution	Ensuring the Project complies with the Projects Terms of Reference ensure the project complies with Local Legislation and Funders ESPF	Impede project implementation timeline affect community trust and confidence in the process and project	No action required

Stakeholders	Stakeholder Impact (Level of impact the project has on the stakeholder)	Influence (level of influence the stakeholder has on the project)	What is important to Stakeholder	How can the Stakeholder Contribute / Influence the project	Engagement Strategy
			health and safety o f workers and community	Managing Community expectations	
Project Affected Persons					
Workers	High	Beneficiaries / Project execution	Employment Working conditions advancing the project	Advancing the execution of the project Ensuring that project is executed according to plans and designs	Continuous Engagement, Project plans and work schedule, policies, compliance trainings for
Residents Graeme Hall	High	Project Beneficiaries	Communicating project impacts transparently, together with the mitigation measures applied to reduce adverse effects, and not adverse	Helping to define project impacts, social monitoring of Project	P periodic engagement to provide project scheduling and activities awareness sessions on construction safety, traffic and road safety around the site, vector source reduction at household level, and use of the Grievance Redress Mechanism and engagement for project
Residents	High	Project Beneficiaries	Communicating project impacts	Helping to define project impacts,	P periodic engagement to

Stakeholders	Stakeholder Impact (Level of impact the project has on the stakeholder)	Influence (level of influence the stakeholder has on the project)	What is important to Stakeholder	How can the Stakeholder Contribute / Influence the project	Engagement Strategy
Rendezvous Gardens			transparently, together with the mitigation measures applied to reduce adverse effects, and not adverse	social monitoring of Project	provide project scheduling and activities
Residents Amity Lodge	High	Project Beneficiaries	Communicating project impacts transparently, together with the mitigation measures applied to reduce adverse effects, and not adverse	Helping to define project impacts, social monitoring of Project	Awareness sessions on construction safety, traffic and road safety around the site, vector source reduction at household level, and use of the Grievance Redress Mechanism and engagement for project
Farmers Graeme Hall	High	Project Beneficiaries	Communicating project impacts transparently, together with the mitigation measures applied to reduce adverse effects, and not adverse	Helping to define project impacts, social monitoring of Project	P periodic engagement to provide project scheduling and activities
GBV support service providers	High	High	Managing and mitigating GBV/SEAH risks and impacts	Supporting management of GBV/SEAH risks and impacts	Periodic engagement
Barbados Agricultural	High	Farmer's representativ	Ensuring inclusion of farmers in engagement activities	Participation in engagement activities to	Engagement for project

Stakeholders	Stakeholder Impact (Level of impact the project has on the stakeholder)	Influence (level of influence the stakeholder has on the project)	What is important to Stakeholder	How can the Stakeholder Contribute / Influence the project	Engagement Strategy
Society		e body	Communicating project impacts transparently, together with the mitigation measures applied to reduce adverse effects	provide perspectives, concerns and needs from the agricultural community	
Barbados Council for the Disabled (BCD)	Medium	PWDs representative body	Ensuring inclusion of PWDs community in engagement activities Communicating project impacts transparently, together with the mitigation measures applied to reduce adverse effects	Participation in engagement activities to provide perspectives and concerns from the PWD community	Engagement for project
Barbados National Organization of the Disabled (BARNOD)	Medium	PWDs representative body	Ensuring inclusion of PWDs community in engagement activities Communicating project impacts transparently, together with the mitigation measures applied to reduce adverse effects	Participation in engagement activities to provide perspectives and concerns from the PWD community	Engagement for project
National Organization of Women (NOW)	Medium	Women's Organization	Ensuring inclusion of women in engagement activities Communicating project impacts transparently, together with the mitigation measures applied to reduce adverse effects	Participation in engagement activities to provide perspectives and concerns	Engagement for project

Stakeholders	Stakeholder Impact (Level of impact the project has on the stakeholder)	Influence (level of influence the stakeholder has on the project)	What is important to Stakeholder	How can the Stakeholder Contribute / Influence the project	Engagement Strategy
Barbados Professional Women's Club	Medium	Women's Organization	Ensuring inclusion of women in engagement activities Communicating project impacts transparently, together with the mitigation measures applied to reduce adverse effects	Participation in engagement activities to provide perspectives and concerns	Engagement for project
Equals Barbados	Medium	LGBTQI+ Organization	Ensuring inclusion of the LGBTQI+ community in engagement activities Communicating project impacts transparently, together with the mitigation measures applied to reduce adverse effects	Participation in engagement activities to provide perspectives and concerns	Engagement for project
Barbados Youth Development Council	Medium	Youth Organization	Ensuring inclusion of youth in engagement activities Ensuring project impacts are not adverse	Participation in engagement activities to provide perspectives and concerns	Engagement for project
Caribbean Youth Environment Network (CYEN)	Medium	Youth Organization	Ensuring inclusion of youth in engagement activities Ensuring project impacts are not adverse	Participation in engagement activities to provide perspectives and concerns	Engagement for project

The stakeholder relationship map is shown at Figure 75.

For the purposes of this SEP, stakeholder identification comprises primary and secondary as well as internal and external stakeholders. Primary affected groups include residents and households within the direct area of influence, farmers, nearby businesses, local road users and workers at the treatment facilities and camp. Secondary groups include civil-society and community organizations and persons indirectly affected by changes in water supply, traffic or services. Internal groups include CRSEG, its subcontractors, on-site personnel and the BWA/PEU project team; external groups include neighbours, affected businesses, farmer associations, regulatory agencies, service providers and vulnerable or underrepresented community members. Table 156 provides the power–interest assessment.

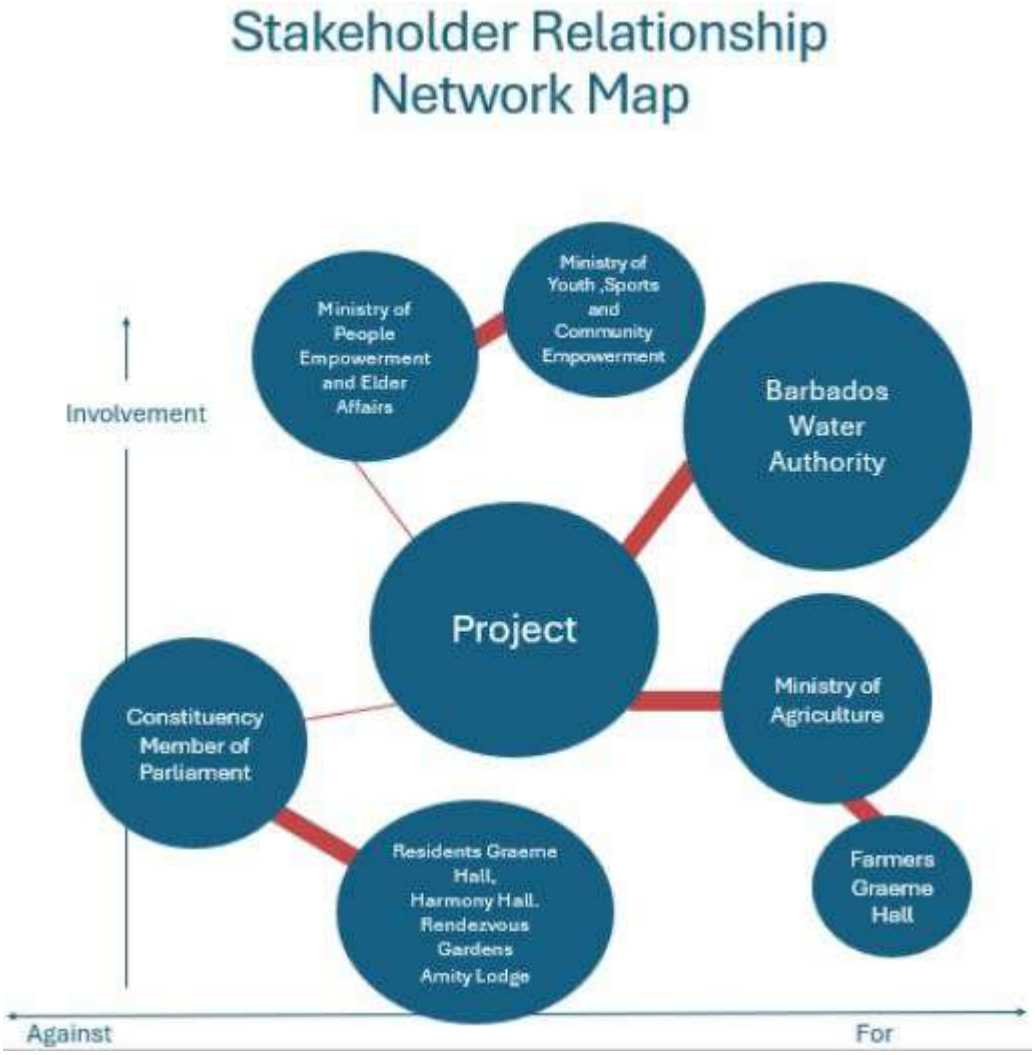


Figure 75: Stakeholder Relationship Map

- Bubble size indicates degrees of influence
- Line thickness indicates the strength of the relationship

Stakeholder engagement methodology and consultations

Stakeholder identification and corrective-action protocol: At each engagement review, the Social Personnel and Community Liaison Officer should compare the register and attendance records with the project's direct and indirect impact areas and with stakeholder groups identified in the Gender and Social Assessment. Where older residents, persons with disabilities, women, female-headed households, low-income households, migrant/non-local workers or other exposed groups have not been

reached, the gap is recorded with its cause, a responsible officer, a specific alternative approach (accessible location, translated materials, individual interview, targeted meeting or alternative time), a completion date and verification through subsequent participation records. Engagement results and unresolved concerns are reported to the PEU and tracked through the SEP and grievance mechanism. These measures constitute the planned corrective procedure and are not evidence that all groups have already participated.

Stakeholder consultations are a key mechanism used by bureaucratic and legislative decision-makers to actively engage citizens and interest groups in the design, formulation, and evaluation of public policies and legislation. Consultations allow policymakers to gather expertise and policy-relevant information about the feasibility of policy options, to hear stakeholders' preferences regarding policy outcomes, and to evaluate the implementation and socio-economic impact of policy measures. Consultations are a key source of policy input and feedback. They constitute a trademark of better regulation measures and a key component of legitimate, accountable, and responsive democratic government.

To ensure the participation and inclusion of interested stakeholders the project's stakeholder consultation will involve the identification of key stakeholders, and thereafter the conduct of stakeholder consultation meetings. Social surveys are standardized procedures to gather information from large populations. However, at this stage, the researcher has not been able to meet with any designated women's, youth, older persons or PWD groups. This can be incorporated in another round of consultation.

The data collection instrument used during the scoping phase of the project is an interview guide. The nature and use of interview guides is described under Methodology earlier in this Social Assessment and is not repeated here. The interview guide is a structured document, often a list of questions, topics, or prompts used by interviewers to ensure consistency, reduce bias, and cover key information from the research populations. It serves as a flexible script for conversations, allowing for both standardization and open-ended exploration[134].

This method was chosen since the views of community members are not homogeneous, how individuals react to stimuli in a given space is not the same. Some residents may have strong views on a topic while others may not, depending on the level of information available, influence, potential for impact etc. The interview guide allows research participants (community members) to freely express their individual thoughts and concerns, which are not homogeneous, allowing the researcher to listen to the views expressed.

The target population for the Project comprises residents from four communities, two government agencies and farmers, who are within the project's **Direct Area of Influence and Indirect Area of Influence** and likely to be impacted by the Project's planned activities. The target population is drawn from the socio-economic catchment of 1 km defined in the Project Area of Influence section.

Simultaneously, qualitative data will be collected through a process of secondary research, through in-person interviews with key stakeholder groups and information disclosure meetings with key stakeholders such as the government and advocacy groups. Participants who attend advertised scoping,

[134] https://sk.sagepub.com/ency/edvol/research/chpt/interview-guide (SAGE Research Methods, n.d.)

consultation, and information disclosure meetings will provide input on possible impacts and expectations of the project.

Inclusion criteria

- Persons residing within the socio-economic catchment, being 1 km from the site boundary, as defined in the Project Area of Influence section.
- Persons at home when the team visit.
- Attend scheduled virtual/ in-person information consultation and disclosure meetings.
- Persons who consent to participate in the survey (scoping exercises)

Exclusion criteria

- Persons younger than 18 years of age.
- Persons not residing in the Project's Area of Influence

The data collection period that informed the preparation of this document ran from April 15th to April 18th, 2026, and is expected to continue as the project progresses. Data on Consultation will be updated as needed. A list of preliminary questions and concerns posed by the community members during the scoping activity can be seen in the Appendix. The consultation records referred to are provided at Appendix 2, Engagement Population Demographics, and Appendix 3, List of Community Questions and Concerns Expressed During Field Exercise 15 to 18 April 2026. All tables, figures and appendices are introduced in the text at the point of first reference and are numbered consecutively.

Public Consultation Prior to the Start of Works

A public consultation will be held before works commence and will sensitize stakeholders including authorities and community members, including representatives of vulnerable groups, on important project details such as the process, project scope, potential impacts, and stakeholder engagement activities to be conducted. This consultation will be held at a conveniently accessible venue and streamed via a virtual platform to ensure that all stakeholders have a fair opportunity to be engaged and to participate in discussions. Activities at this consultation will include presentations and a session at the end to obtain stakeholder feedback.

Recommendations for Future Consultation

Meeting invitations and consultation methodology. Community residents are invited to town hall-style meetings, which can be accessed via in- person and virtual means, through virtual communication platforms such as email, social media, radio, and WhatsApp circulation. Venues, dates and times must be clearly communicated in invitations. Consultation methodologies for women should consider separate consultations for women where needed, and consultations should be scheduled at times that accommodate women's time poverty due to care burdens. Collaboration with the Bureau of Gender Affairs and local NGOs/CSOs are useful for facilitating outreach with women, women's organizations, and other vulnerable groups. Further consultation logistics planning includes preparation of consultation materials (including agendas and attendance lists) and refreshments for attendees at in-person meetings. Those responsible for video and photographic materials must be hired and consent for such obtained at the beginning of the engagement. Views collected from stakeholders during

engagements must be documented to inform the preparation of a Public Consultation Report attached to the ESIA/ESMP document.

There will be information disclosure ahead of visits. The Project prints and distributes information with updated correspondence to share with community residents, discussing the phase the project is in and what members of the community can expect, so that they can be meaningfully engaged ahead of planned visits and consultations. There will also be an appraisal of local social and cultural protocols. Appropriate information will be shared for the consultations ahead of time about social and cultural nuances within the local environment, allowing future consultants to be prepared for the eventualities and to maximize impact and planning. Post-consultation processing will also take place. Stakeholder views documented from consultations must be processed and included in the Public Consultation Report attached to the ESIA/ESMP document, with suggestions incorporated into the final ESIA/ESMP document and final publication on the BWA and IDB websites.

The Stakeholder Assessment Matrix at Table 156 sets out the engagement strategy and frequency for each stakeholder group and should be read with these recommendations.

Consultation approach

A two-step approach to social engagement will be implemented, designed both to inform stakeholders and to curate their concerns and expectations. The implementation approach will include the following:

- Engagement to inform key stakeholders and authorities to disclose important project details pertaining to the process, project scope, potential impacts, curate their concerns and expectations, and stakeholder engagement.
- Engagement with project-affected stakeholders to disclose project scope, impacts, grievance mechanisms, curate their concerns and expectations, and discuss any potential for resettlement.

Data analysis

During the consultation phase of the project, the data collected will be analyzed using thematic analysis. The qualitative data will be analyzed thematically using an inductive approach. The data will be presented textually.

Consultation During the Design Phase of the Project

The first scoping activities of the project were conducted from 15 to 18 April 2026. The activity was a house- to- house, one- on- one meeting with residents in the impacted communities. The activity aimed to:

- Appraise stakeholders about the project phase,
- Scope concerns of stakeholders relating to the project,
- Allow stakeholders to ask questions
- Managing stakeholders' expectations of the project and
- Provide information on the projects' next steps

Consultant's general overview of scoping activity

Many community residents were not prepared to have the discussion about the project, since it had been a long time since they had information about the project discussed in the public sphere, or had received an update on the project. However, residents who did participate in the engagement openly shared their concerns about the project generally and about the development of the Workers' Camp in particular. Some residents had many questions about water scarcity, water prices, jobs, sanitary practices of workers, dust, and odor emanating from the facility.

Sampling technique

Convenience sampling was used, that is, residents who were available and agreed to speak with the researcher were interviewed during the activity. In this context, a sample is a group that is drawn from an entire population. The reason a sample is drawn is that the project cannot reasonably reach all of the people affected by the project.

Limitations of the Scoping Activity

Availability of residents during the activity: Visits were scheduled for 4:30 pm to accommodate working residents. This proved a challenge. Many residents were still not at home at the time. As darkness fell, residents receded to their homes, making it difficult to engage. Some were also scared when approached in the darkness of the night.

Lack of Information in the public sphere about the project: The lack of information in the public sphere meant that the interviewer was required to share extensive information, which minimized the time to engage with a planned quota of 10 households per day per area.

Lack of knowledge about local Protocols of arranging meetings with government officials: The lack of critical information on scheduling formal meetings with government agencies resulted in a lost opportunity to conduct in-person meetings with government officials while physically in the country during the scoping mission ***The applicable protocol has since been established. Meetings with government agencies are arranged through the Project Execution Unit, which makes the approach on behalf of the project and confirms the attendance and level of representation. That route is recorded in the Stakeholder Engagement Plan so that the difficulty encountered during the April 2026 exercise does not recur.***

Recommendations

- **Meeting invitations / Consultation methodologies:**

Community residents are invited to town hall-style meetings, which can be accessed via in person attendance, noting that the Barbados Water Authority have advised that the September 2026 town hall is to be held in person only.

- **Information disclosure ahead of visits to prepare residents:**

Advance disclosure and consultation evidence: The SEP requires advance notices and accessible information before consultations and community visits, with the date, distribution channel, recipient groups, languages and accessibility arrangements retained in the disclosure register. Where BWA or IDB website publication is used, the register should record the actual publication date, URL or dated screenshot and document version. The annexed Town Hall records document consultation proceedings but do not, by themselves, establish that every advance-notice or website-disclosure

requirement was met. The notices issued between June and September 2026 are listed in the disclosure record in Annex I.

The Project prints and distributes information update correspondence to share with community residents, discussing the phase the project is in and what members of the community can expect, so that they can be meaningfully engaged ahead of planned visits and consultations.

- **Appraisal of local social and cultural nuances/ protocols:**

Appropriate information will be shared with the consultations ahead of time about social and cultural nuances within the local environment, allowing future consultants to be prepared for the eventualities and to maximize impact and planning

- **Additional Notes:** Please see also the *Stakeholder Engagement Matrix* for additional details of the communication strategy, which includes meeting frequency and the like, intended to be utilized during the execution of the project.

Consultation chronology and limitation: the household scoping exercise took place on 15–18 April 2026, the recorded first Town Hall was held on 23 September 2026, and the virtual Town Hall was held on 8 October 2026. The Town Hall record reports that mobilization activities, including site clearing and preparatory access works, had already begun by the first Town Hall. Accordingly, the available records do not demonstrate that all consultation preceded every site activity. They distinguish early scoping and mobilization from the main construction program; no contrary finding about compliance with pre-works consultation timing is asserted without dated notices and work-start records.

8.4.12. Grievance Redress Mechanism

This Grievance Redress Mechanism (GRM) document outlines the procedures and principles for receiving, addressing, and resolving grievances and concerns raised by both project workers and community members affected by the Barbados Climate Resilient South Coast Water Reclamation and Reuse Facilities Project. The GRM is developed in accordance with the principles of IDB ESPF 10 and CRSEG's commitment to social responsibility and sustainable project execution.

The primary purpose of this GRM is to provide a centralized, fair, transparent, and efficient channel for all parties to submit feedback and raise concerns related to project operations. It aims to ensure fair, effective, and lasting outcomes, mitigate risks, build trust, and facilitate the systematic identification of emerging issues for corrective and pre-emptive engagement. However, it does not replace social or justice systems in Barbados nor impedes access of stakeholders to administrative and judicial remedies.

Scope Of The GRM

This GRM is designed to cover:

- **Project Workers:** Applies to all categories of workers, including men, women, migrant workers, youth, and other vulnerable groups, CRSEG employees, workers engaged by third parties (subcontractors), and primary supply workers assigned to the project. It addresses labor and workplace issues such as conditions of employment, discrimination, harassment, SEA/SH/GBV, occupational health and safety, fair

contracts, wages, working hours, rest periods, discrimination, Sexual Harassment (SH), Sexual Exploitation and Abuse (SEA), and Gender-Based Violence (GBV).

- **Community Members:** Individuals or groups within communities affected by project activities. Grievances may relate to project's environmental impacts (such as dust, noise, lighting, waste management, others) and to social impacts (such as traffic, worker behavior including harassment or inappropriate behavior by project workers, safety incidents, security concerns, or any other community-facing impact).

The scope of the community and worker grievance pathways explicitly includes occupational health and safety, environmental, social and gender-related impacts.

Dual Pathways of the GRM

The GRM operates through two coordinated but distinct pathways, each tailored to the nature of the grievance and the group affected:

1. **Worker GRM (Labor and Workplace Issues):**
    - Applies to all categories of project workers, including men, women, migrant workers, youth, and vulnerable groups.
    - Addresses concerns related but not limited to employment conditions, wages, discrimination, harassment, SEA/SH/GBV, occupational health and safety, and other workplace rights.
    - Managed by designated workplace focal points (e.g., Project Manager, HR Representative), with confidentiality safeguards in place for sensitive cases.
2. **Community GRM (Project Impacts in Communities):**
    - Applies to individuals and groups in communities affected by project activities.
    - Covers grievances related to environmental, social, and gendered impacts, including pollution, harassment or inappropriate behavior by project workers, disproportionate impacts on older persons, PWDs, women, and other vulnerable groups.

Community grievances may concern noise, dust, odor, vibration, wastewater or stormwater discharge, water quality, waste and hazardous materials, traffic and road safety, lighting and access restrictions, public health and vector risks, livelihoods, harassment or inappropriate worker conduct, discrimination, and disproportionate effects on older persons, persons with disabilities, women, female-headed households, children and other vulnerable groups. Sensitive allegations follow the restricted-access, survivor-centred pathway described below.

Coordination and Confidentiality:

- While both pathways are coordinated under the overall GRM framework, they have different focal points, procedures, and confidentiality requirements.
- Special provisions apply to cases of SEA/SH/GBV. Victims will be offered information on and referral to the appropriate medical, legal, psychosocial, and protection services required.

- Use of external social services is voluntary and survivor-centered, ensuring confidentiality, informed consent, and respect for dignity.

Key Principles

The GRM will operate under the following core principles:

- **Accessibility:** The GRM will be widely communicated and accessible to all project workers and community members, including women, persons with disabilities (PWDs), youth, migrant workers and other potentially vulnerable groups. It will be explained in simple, non-technical language and promoted through multiple channels such as posters, flyers, community meetings, radio, digital platforms, and workplace briefings. Complaints may be submitted through hotlines, email, grievance boxes, in-person reporting, or mobile outreach, with options for anonymous and confidential reporting. These channels will be designed to be safe, ensuring accessibility for women, men, PWDs and low-literacy groups. To respect dignity and confidentiality, complainants may request to interact with a male or female focal point for sensitive cases, including SEA/SH/GBV. All reporting channels will be designed to be inclusive, culturally appropriate, and responsive to the needs of diverse groups.
- **Transparency:** The process for submitting, assessing, and resolving grievances will be clear and communicated to all stakeholders.
- **Fairness and Impartiality:** All grievances will be assessed objectively and resolved in a fair and equitable manner, considering relevant legislation, best practices, and project procedures.
- **Confidentiality and Anonymity:** Grievances will be treated with utmost respect, and anonymity will be enforced where warranted. Confidentiality of complainants and witnesses will be protected to the fullest extent possible. Complaints will follow a survivor centered approach, ensuring that the victim's informed consent is sought before any information is shared. Disclosure will be strictly limited to essential personnel on a need-to-know basis, and all records will be kept in secure, restricted files that are separate from general grievance documentation. Confidentiality, dignity, and safety will be prioritized at every stage, with procedures designed to protect the identity of victims and prevent retraumatization.
- **Non-Retaliation:** No retaliatory measures will be taken against residents or workers who report incidents or raise concerns. Complainants, witnesses and those assisting them will be protected from any retaliation or discrimination that may result from using the GRM.
- **Gender-Responsiveness:** This principle ensures that grievance handling and stakeholder engagement processes are sensitive to the differentiated needs of women, men, girls, boys, and gender-diverse persons. It is gender-responsive because victims and complainants may prefer to meet with a male or female focal point, and this choice will be respected. Interviews and grievance discussions will be conducted in private, safe spaces that protect confidentiality and dignity, and scheduled at times compatible with caregiving responsibilities and work schedules to avoid exclusion. GRM information and meetings will actively promote the participation of women and girls through targeted outreach, accessible formats, and the presence of female focal points where appropriate. These measures ensure that barriers to participation are reduced, that vulnerable groups are not disadvantaged, and that the process is inclusive, equitable, and survivor-centered.

- **Timeliness:** Grievances will be acknowledged and resolved within defined timeframes.
- **Accountability:** Clear roles and responsibilities are assigned for managing grievances, and the GRM's effectiveness will be regularly monitored and audited. Lessons learned and trends observed and identified (from the analysis of disaggregated GRM data) will be integrated into periodic reviews and updates of the ESMP.

Roles And Responsibilities

- **Social/ GBV/ SH/ SEA Personnel (Focal Point Person):** A designated Social Specialist/ GBV/ SEA/ SH Focal Point shall be appointed to manage grievances and sensitive cases, including Gender-Based Violence (GBV), Sexual Exploitation and Abuse (SEA), and Sexual Harassment (SH), in line with survivor-centered principles and relevant guidance frameworks. This individual will be responsible for recording, assessing (for general grievances), communicating responses, and maintaining the electronic grievance log. For sensitive GBV/SEA/SH cases, a separate, secure grievance register shall be maintained, distinct from the general log, with access strictly limited to authorized personnel on a need-to-know basis.

Recognizing that Human Resources representative may not always be the safest or most trusted route for victims, the role shall be filled by a suitably qualified professional such as a social worker, psychologist, occupational health and safety doctor, or HR staff member who has received specific training in survivor-centered approaches, confidentiality protocols, and trauma-informed care. Survivors and complainants shall have the option to meet with either a male or female focal point, and at least one female staff member will be designated to handle such cases where feasible, to ensure comfort and dignity. The Social Specialist/ GBV/ SEA/ SH Focal Point shall also serve as a primary contact for external stakeholders, ensuring transparent communication and trust-building. At every stage, confidentiality, informed consent, dignity, and protection of identity will be prioritized, with procedures designed to safeguard survivors, prevent re-traumatization, and uphold professional standards of care.

- **Grievance Redress Committee (GRC):** Comprised of representatives from the Project Executing Unit (PEU), Contractor (CRSEG), and Supervising Consultant. This committee is tripartite, must be gender-inclusive, and is responsible for reviewing and resolving grievances escalated from Tier 1.
- **Project Management / Senior Management:** Responsible for the overall oversight of the GRM, including periodic auditing and review of its accuracy and relevance. Senior Management shall also ensure that corrective actions are taken where recurring or systemic issues are identified, and that lessons learned are integrated into project operations. To build trust and transparency, anonymized summaries of grievance trends and responses will be prepared and shared periodically with the PEU. These summaries will highlight common issues, actions taken, and outcomes, while protecting the confidentiality of complainants.
- **Team Leads (Environmental, Social, Engineering, etc.):** Provide detailed knowledge and input on specific issue categories when grievances are escalated. In addition, they are responsible for ensuring that any mitigation measures arising from grievances are designed with attention to differentiated impacts on women, men, youth, older persons, persons with disabilities (PWDs), and low-income groups. This requires applying a gender-responsive and inclusive lens to

technical solutions, so that corrective actions do not inadvertently disadvantage vulnerable populations and instead promote equitable outcomes across stakeholder groups.

Grievance Redress Process (General Grievances)

The grievance management process will follow the subsequent steps:

Step I: Receive Grievance

- **Channels:** Grievances can be submitted through:
- Recording at stakeholder engagement events.
- Mailbox
- Designated project email
- Designated project telephone number
- Social media platforms
- In-person complaints to designated male or female focal point persons.
- Notice boards with contact information will be posted at the project site entrance.
- All input received will be recorded by the Social Personnel.

Anonymous Submissions

Grievances may also be submitted anonymously through any of the available channels, including mailboxes, email, telephone, or written notes. Anonymous submissions will be treated with the same seriousness as identified complaints, recorded in the Grievance Log, and addressed in accordance with the GRM. While anonymity may limit follow-up communication, every effort will be made to investigate and resolve the issue while protecting confidentiality.

Step II: Communicate Receipt of Grievance & Record

- The Project Team will acknowledge receipt of the grievance within **2 working days**. For emergencies or urgent/important cases, the grievance should be communicated during the first 24 hours and solution provided in 2 working days.
- All grievances, including those from community consultations, will be logged in an electronic **Grievance Log** by the Social Personnel. All grievances are registered upon receipt. The log will categorize grievances as environmental, social or gender (e.g., age, type of stakeholder, vulnerability, dust pollution, sanitation, etc.).
- Complainants will be informed that their grievance has been recorded through the same channel used for submission, unless anonymity was requested. For written or electronic submissions (email, mailbox, telephone, social media), an acknowledgment message will be sent within two working days. For in-person submissions, the complainant will receive a verbal confirmation and, where feasible, a written or digital receipt. Notice boards at project sites will also display information on how grievances are acknowledged and tracked.

Step III: Assess Grievance for Merit

- The Social Personnel will assess the merit of the grievance through investigation. The assessment shall determine how the complaint is categorized (e.g., environmental, social, gender, or other relevant categories) and how it will be handled. For cases involving SH, SEA), or GBV, a survivor-centered approach will be applied, ensuring confidentiality, informed consent, and protection of identity at every stage. Any photo, interview, or recording undertaken as part of the investigation shall only be conducted with the explicit permission and authorization of the complainant or victim, and in safe, private settings that respect dignity and minimize risk of re-traumatization.
- Every grievance remains on the Grievance Log from the date of receipt. The outcome of the merit assessment, including any decision not to investigate and the reason for it, is recorded against the entry, so that complaints screened out are still counted in grievance statistics. SH/SEA/GBV and other sensitive cases are recorded in a separate confidential register with restricted access.

Step IV: Resolve Grievance (Tiered Approach)

- **Tier 1 Resolution (Social Consultant):** The Social Personnel (Social Consultant) will endeavor to resolve the grievance.
- **Timeline:** Simple cases are targeted for resolution within **7 working days**. For cases involving SH, SEA, or GBV, immediate measures will be taken to ensure the safety, dignity, and access to services for survivors. This includes:
    - Providing safe referral to medical, psychosocial, legal, or protection services within 24 hours.
    - Ensuring interviews or discussions are conducted in private, secure spaces with the survivor's consent.
    - Offering the choice of a male or female focal point to handle the case.
    - Implementing corrective actions that restore or improve access and safety for women, children, PWDs, and other vulnerable groups.
    - All responses will follow a survivor-centered approach, prioritizing confidentiality, informed consent, and protection of identity.
- If not resolved within 7 days, the grievance is moved to Tier 2.
- **Tier 2 Resolution (Grievance Redress Committee):** The Grievance Redress Committee (PEU, Contractor, Supervising Consultant) will review and seek to resolve the grievance.
- **Timeline:** The committee will aim to resolve the grievance within **14 days**.
- If not resolved within 14 days, the grievance can be escalated to Tier 3.
- **Tier 3 Resolution (Legal System):** If the grievance remains unresolved after Tier 2, legal action can be taken to resolve the issue, as the court is the final authority within Barbadian legislation.

Step V: Communicate Responses

- The Project's Social Personnel will communicate the resolution or the status of the grievance to the stakeholder who raised the concern. Communication will follow a Process Flow guiding escalation based on severity. All communication with complainants shall use simple, plain language and channels appropriate to their needs, including written notices, phone calls, or in-person discussions. Explanations of decisions and next steps will be provided in a manner that ensures the complainant especially if from a vulnerable group such as women, children, older persons, or PWDs fully understands the outcome and available options.
- Complainants will also be informed of their right to appeal if they are dissatisfied with the resolution, and guidance will be provided on how to access the appeal process.

Step VI: Grievance Appeal

- If stakeholders are dissatisfied with the final decision, they may escalate their grievance to the Grievance Redress Committee (Tier 2). Appeals should be submitted within 10 working days of receiving the decision, and the GRC will provide a response within 20 working days. The GRC will determine whether the decision should be reconsidered, taking into account legislation, best practices, and precedence.
- Complainants may also seek support from external social services, protection agencies, or trusted community institutions during the appeal process. In cases involving SH, SEA, or GBV, victims retain the right to escalate their grievance directly to national protection and justice systems at any time, independent of the project's internal process.
- Further escalation could be raised to the Barbados Water Authority (BWA) or the Inter-American Development Bank (IDB) through its grievance protocol form.

Grievance Categories and Escalation Pathways

Section 5.1 uses **Table 157** as the primary screening tool for all grievance categories, including community health and other health-related grievances. The table identifies under Section 5.1. It distinguishes the likely issue type, examples of main community health and worker-community and worker health concerns, the primary focal point, and the escalation pathway to be followed. Its categories, identifies where health-related issues may arise within those categories. The table should be used together with **Figure 76** to determine the appropriate the responsible initial focal point, whether the matter follows the standard Tier **1**, which illustrates how grievances move from receipt and acknowledgment through screening, routing, escalation, closure and monitoring. to Tier 3 pathway, and whether the clarifies when a grievance also requires must be treated as an urgent health, safety, environmental, confidential or authority notification actions.

Table 157 presents grievance categories, health-related Issues, focal points and escalation pathways.

Table** 157**: Grievance Categories, Health-Related Issues, Focal Points and Escalation Pathways

Category	**Examples of Issues, Including Community Health and Health-Related Grievances**	**Primary Focal Point**	**Escalation Pathway**
Emergency & Safety	Fire, flooding, hazardous spills, chemical or fuel release, unsafe conditions, medical emergency,	HSE Representative / Community	Immediate control action; escalate to HSE Representative and Community Health Focal

Category	Examples of Issues, Including Community Health and Health-Related Grievances	Primary Focal Point	Escalation Pathway
	alleged illness or injury, suspected outbreak, wastewater exposure, hydrogen sulfide alarm exceedance, or other urgent community or worker health and safety risk with explicit consideration of the needs of women, children, older persons, PWDs. Where such emergencies intersect with harassment or GBV concerns, these shall be routed to the confidential SEA/SH/GBV pathway for appropriate handling.	Health Focal Point	Point; assess health risk within 48 hours; report to PEU and competent authorities where required; Tier 2: GRC → Tier 3: Legal/Authorities.
Occupational Health	Heat stress, PPE concerns, unsafe work conditions, sanitation, potable water, worker accommodation, food hygiene, vector-borne disease risk, exposure to wastewater, dust, chemicals, biological hazards, or occupational illness or injury with explicit recognition of heightened risks for women, pregnant workers, migrants, and youth who may face differential vulnerabilities.	HR Representative / HSE Representative	Tier 1: HR/HSE → Project Manager → Tier 2: GRC → Tier 3: BWA/IDB, Labour Department, health authority or other competent authority where applicable. Urgent health risks require immediate inspection and corrective action. Escalation pathways allow for anonymous reporting.
Worker Influx & Community	Noise, cultural conflicts, harassment (including gendered safety and harassment risks for women, girls and other vulnerable groups), local hiring concerns, nuisance behavior, littering, crowding, perceived safety risks, worker-community interactions affecting wellbeing, community stress, or increased risks associated with worker presence.	Community Liaison Officer / HR Representative	Tier 1: CLO/HR → Project Manager → Tier 2: GRC → Tier 3: PEU. Health or safety implications are referred to HSE and the Community Health Focal Point.
SEA/SH/GBV	Sexual harassment, sexual exploitation and abuse, gender-based violence, child protection concerns, coercion, intimidation, retaliation, or sensitive misconduct affecting workers, community members, visitors or service users.	HR Representative / Survivor-Centered Response Team[135]	Confidential pathway only; do not record identifying details in the general grievance log. Use restricted-access records and survivor-centered referral to medical, psychosocial, legal, police or child protection services where requested or required.
Security Personnel	Misconduct, abuse, excessive force, intimidation, discrimination, harassment especially toward to	HR Representative / Project Manager	Tier 1: HR/Project Manager → Tier 2: GRC → Tier 3: Authorities. Sensitive cases follow the confidential

[135] The Survivor-Centered Response Team will be composed of the other members of the management team who may need to get involved depending on the severity and nature of the case as well relevant national authorities. Additionally, victims may choose a female/male focal point, prioritize urgent safety/medical support, and keep records highly confidential.

Category	Examples of Issues, Including Community Health and Health-Related Grievances	Primary Focal Point	Escalation Pathway
	women, youth and migrants, access control concerns, retaliation, or health and safety concerns arising from security interactions.		pathway; urgent safety risks require immediate response. SH/SEA/GBV complaints will be routed to the specific pathways.
Traffic & Mobility[136]	Road disruptions, unsafe transport, speeding, pedestrian near-miss, school-hour movement breach, emergency access blockage, road damage, mud or debris on roads, haulage scheduling, or poor communication of traffic changes.	Social Personnel / Community Liaison Officer / HSE Representative	Tier 1: Social/CLO/HSE → Community Health Focal Point where health or safety risk is alleged → Tier 2: GRC → Tier 3: PEU. Immediate escalation for pedestrian near-miss, injury, school-hour breach or serious safety risk.
Cultural Heritage[137]	Chance finds during excavation, damage to heritage sites, disturbance of culturally important locations, access concerns, community safety concerns, or health and safety issues around heritage areas.	Project Manager / HSE Representative	Tier 1: PM/HSE → Tier 2: GRC → Tier 3: Authorities. Stop-work or chance-find procedures apply where relevant.
Labor & Welfare	Wages, working hours, contracts, benefits, rest periods, housing, welfare facilities, sanitation, drinking water, food, discrimination, fatigue, heat stress, mental wellbeing, gender related issues including discrimination, and bullying of LGBTQI+ and migrant workers,[138] and health-related welfare complaints.	HR Representative / HSE Representative	Tier 1: HR/HSE → Tier 2: GRC → Tier 3: Labor Ministry, BWA/IDB or competent authority. Health and welfare risks require prompt inspection and corrective action.
Environmental Impacts[139]	Dust, particulate matter, noise, vibration, light, waste, odor, sewage odor, bioaerosols, biodiversity (species and ecosystems) concerns, standing water, mosquitoes, rodents, drainage, water quality concerns, wastewater discharge, spills, community exposure concerns and any other environmental impact or pollution matter to air, soil or water.	HSE Representative / Community Environmental and Health Focal Point	Tier 1: HSE → Community Health Focal Point → Tier 2: GRC → Tier 3: EPD, Ministry of Health or other competent authority where required. Health-related complaints are assessed within 48 hours and simple cases targeted for closure within 7 working days.

[136] Traffic measures for safe access by women, children, older persons and PWDs, especially near schools and health clinics and treat repeated "feeling unsafe" reports as serious and urgent.

[137] Women, elders, faith and cultural leaders will be engaged when heritage issues arise and how restrictions may affect customs/rituals, livelihoods and safety for different groups.

[138] These grievances will be recorded and monitored for patterns by sex and worker type.

[139] Dust, odor and noise may disproportionately affect children, pregnant women, older persons and people at home during the day. Complaints from these groups as well those from schools, health clinics and other sensitive receptors will be prioritized.

Category	Examples of Issues, Including Community Health and Health-Related Grievances	Primary Focal Point	Escalation Pathway
General Conduct	Code of Conduct violations, bullying, disrespectful behavior (which includes sexist, homophobic and gender-based insults and exclusion are violations as well), littering, nuisance behavior, intimidation, retaliation, or conduct that affects community wellbeing, perceived safety, or access to project-related information and remedies.	Site Supervisors / HR Representative / Community Liaison Officer	Tier 1: Supervisor/HR/CLO → Tier 2: GRC. Health or safety implications are referred to HSE and the Community Health Focal Point; sensitive cases follow the confidential pathway.

Immediate escalation is required where Table 157 identifies an immediate escalation trigger, including alleged illness or injury, hazardous exposure, wastewater or chemical release, suspected disease outbreak, pedestrian near-miss, school-hour traffic breach, or serious safety risk, or any other actual or potential community health and safety consequence. Priority attention shall be given to women, children, older persons, and PWDs as at-risk groups. Harassment and gender-based safety concerns are treated as serious safety risks and routed through the confidential SEA/SH/GBV referral pathway.

All escalated incidents must be communicated through accessible formats and channels (including non-digital and low-literacy options) to ensure timely awareness and response. Each escalated matter shall be recorded in the Grievance Redress Mechanism (GRM) and analyzed, disaggregated by sex and age where possible, to strengthen prevention and mitigation measures. Escalations are reported to the HSE Representative and Community Health Focal Point, and to the PEU in accordance with incident reporting requirements, with cross-reference to related figures and sections for consistency and clarity.

Figure 76 illustrates grievance Category Screening and Escalation Pathway.

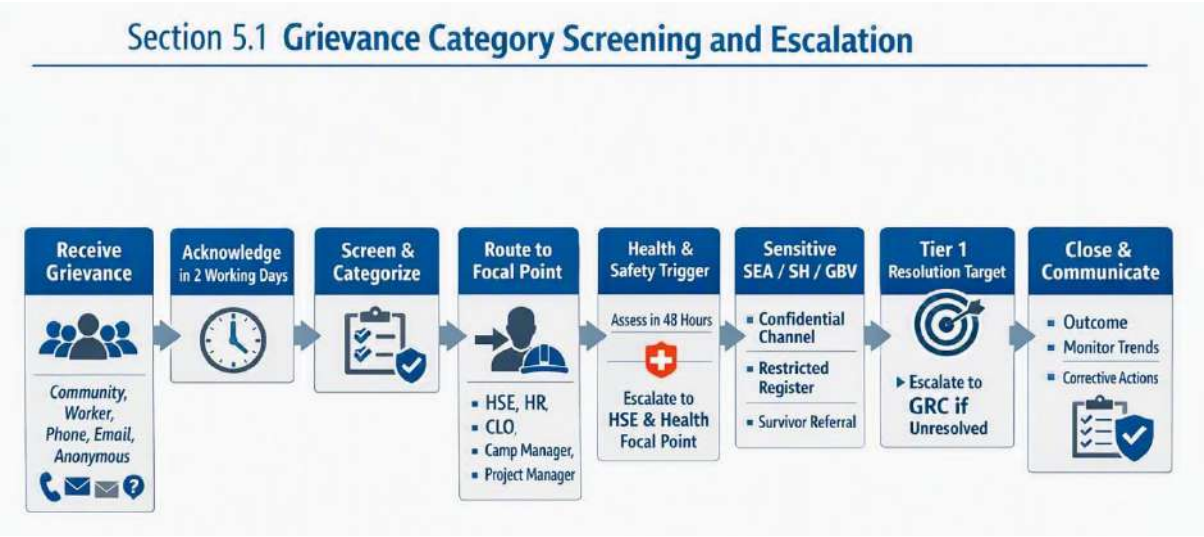


Figure 76**: Grievance Category Screening and Escalation Pathway**

All health-related grievances are acknowledged within 2 working days. Where a grievance alleges a health risk, exposure, illness, injury, vector concern, spill, traffic safety risk or other potential community

health consequence, the matter is, assessed within 24 hours where a health risk is alleged, and routed to the responsible technical lead for immediate control, investigation, control measures, and corrective action, communication.

Figure 77 illustrates health-Related Grievance Screening and Escalation Pathway.

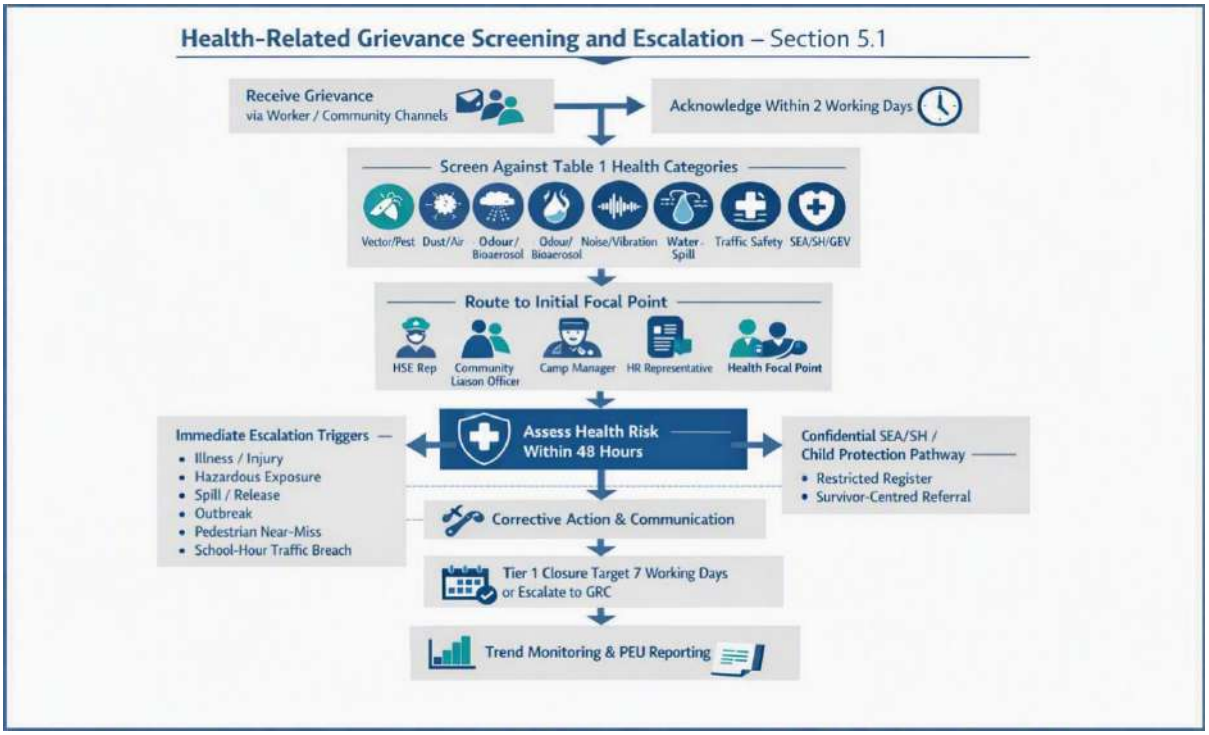


Figure 77**: Health-Related Grievance Screening and Escalation Pathway**

Any grievance involving alleged illness or injury, hazardous exposure, wastewater or chemical release, suspected disease outbreak, pedestrian near-miss, school-hour traffic breach, or other potential community health consequence is escalated immediately to the HSE Representative and the Community Health Focal Point and reported to the PEU in accordance with the complainant, and trend monitoring reporting requirements.

Figure 78 illustrates combined Health-related grievance screening and escalation pathway, including health-related triggers.

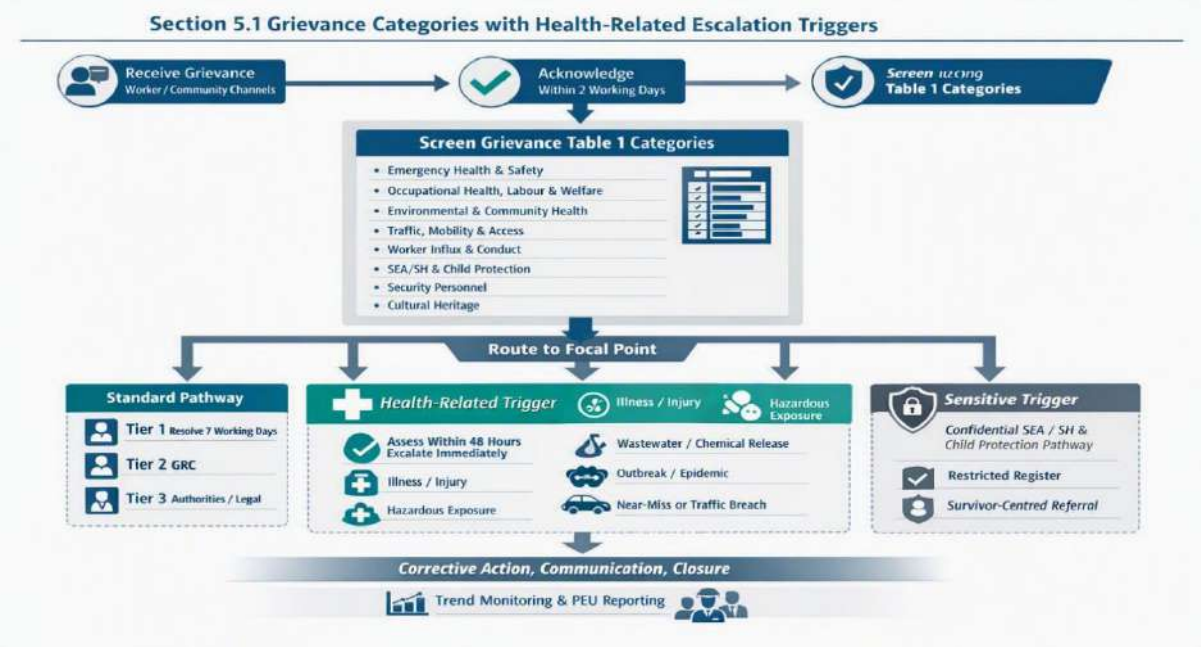


Figure 78**: Combined Health-related grievance screening and escalation pathway, including health-related triggers identified**

SEA/SH/GBV, child protection and other sensitive cases continue to follow the confidential pathway and worker-conduct grievances are not entered into the general grievance log. They are received through confidential channels, recorded only in a restricted-access register using the minimum information necessary, and managed using a survivor-centered approach based on safety, consent, confidentiality, non-discrimination and non-retaliation.

Environmental grievances and impacts to be screened include, as relevant to the three project components: untreated or inadequately treated effluent and bypass release; surface-water, groundwater and wetland contamination; sediment-laden runoff and drainage blockage; wastewater, sludge and chemical spills; dust and air emissions; odor, hydrogen sulfide and bioaerosols; noise, vibration and lighting; hazardous and domestic waste; wildlife, habitat and ecosystem-services disturbance; traffic-related pollution; vector breeding; and cumulative effects at sensitive community receptors.

Each complaint should be linked to the relevant impact pathway, monitoring records, responsible officer, response time, corrective action and closure evidence. This consolidated list is drawn from the assessment's existing impact pathways; it does not purport to reproduce any separate reviewer attachment not supplied.

Specific Procedures For Workers And GBV, SEA, and SH Grievances

CRSEG maintains a **zero-tolerance policy** for Sexual Exploitation and Abuse (SEA), Sexual Harassment (SH), and Gender-Based Violence (GBV). Employees and community members who experience or witness SEA/SH/GBV are strongly encouraged to report these cases immediately through the confidential grievance channels. Reporting is not mandatory for victims, but all staff have a duty to act responsibly to protect others and uphold the Code of Conduct. For worker-related cases, the HR Representative will lead the response and case management. For community-related cases, the Social Personnel or designated focal points will take the lead, ensuring survivors have access to trusted

personnel with appropriate expertise. All reports will be handled using a survivor-centered approach, prioritizing confidentiality, informed consent, dignity, and protection of identity.

Integrating Gender-Based Violence (GBV) and Sexual Exploitation, Abuse, and Harassment (SEAH) inputs into a Grievance Redress Mechanism (GRM) requires a **survivor-centered approach** focused on **safety, confidentiality, and non-discrimination**. Inputs must ensure the GRM can safely receive, record, and refer sensitive complaints without triggering re-traumatization or risk of retaliation.

Reporting Pathways

- **Confidential channels:** Workers must have multiple safe options to report grievances including an HR hotline, anonymous drop boxes in the camp, secure email, or in-person reporting. Each channel must be accessible in workers' native languages and explained during induction.
- **Immediate escalation:** SEAH/GBV, child abuse, or severe safety incidents bypass routine handling and are escalated directly to HR/HSE and, if necessary, external authorities. Escalation to external authorities (e.g., police, protection services, justice systems) will be undertaken only with the informed consent of the survivor or complainant, except where mandatory reporting is required by law (such as child abuse). Survivors will be supported with clear information on their options and offered safe referral to medical, psychosocial, and legal services. All actions will follow a survivor-centered approach, prioritizing confidentiality, dignity, and protection of identity.
- **Community liaison coordination:** If a grievance involves community members (e.g., harassment, noise, or cultural conflict), HR coordinates with the Community Liaison Officer to ensure joint resolution.

Grievance Handling Protocols

- **Acknowledgment:** Every grievance is acknowledged within **two working days**, with confirmation of receipt and next steps. All allegations of SH, SEA, or GBV will be treated as credible upon receipt and follow a separate survivor-centered process distinct from routine grievances. These cases will be acknowledged immediately, with initial safety and referral measures provided within 24 hours. Feedback to complainants will be delivered in simple, clear formats whether in writing, by phone, or in person, to ensure understanding of the decision, next steps, and available support.
- **Assessment:** HR screens grievances for merit, categorizes them (SH/ SEA/GBV, safety, discrimination, welfare), and logs them in the grievance register.
- **Investigation:**
    - Routine cases → HR/HSE team investigates.
    - SEAH/GBV cases → handled by an independent, gender-sensitive team separate from normal management lines.
- **Resolution timeline:**
    - Simple cases resolved within **7 working days**.
    - Complex cases escalated after **14 days** to the Grievance Committee.

- **Feedback and appeal:** Complainants receive written feedback and can appeal unresolved cases to the Project Manager or PEU.

SEAH/GBV-Specific Protocols

- **Survivor-centered approach:** Investigations prioritize confidentiality, consent, safety, respect, and non-discrimination. Survivors decide whether investigations proceed and retain control over the pace and scope of the process. No investigation or information-sharing will occur without the survivor's informed consent, and they may pause, limit, or withdraw participation at any stage. Investigations will be conducted in a survivor-centered manner, prioritizing dignity, confidentiality, and protection of identity, with procedures designed to minimize risk of re-traumatization. **Support services:** Survivors are offered counseling, medical care, and legal aid referrals through approved service providers.
- **Protective measures:** Immediate steps include temporary removal or suspension of the alleged perpetrator pending investigation, to safeguard the victim and community. If necessary, or if specifically requested by the victim, arrangements will be made for the victim's relocation to a safer place or to a location where they feel secure, immediately after the incident.
- **Non-retaliation:** Explicit protection for complainants and witnesses against intimidation, dismissal, or discrimination.
- **Confidential documentation:** SEAH/GBV cases are logged separately with restricted access to authorized personnel only.

Workers' Camp-Specific Protocols

- **Camp grievance box:** Secure boxes placed in common areas, checked weekly by HR/HSE.
- **Camp meetings:** Monthly sessions to discuss recurring issues, preventive actions, and welfare improvements. Where feasible, separate or safe-space discussions will be organized for women and other vulnerable workers (including youth, older persons, and PWDs) to ensure that concerns related to harassment, safety, or welfare can surface without pressure or fear of retaliation. Outcomes from these sessions will be integrated into the broader monthly review to strengthen preventive measures and improve workplace wellbeing.
- **Welfare and sanitation:** Complaints about facilities (e.g., hygiene, food, accommodation) logged and resolved within **7 days**.
- **Safety and emergency:** Unsafe conditions trigger immediate inspection under the Emergency Response Plan.
- **Cultural sensitivity:** Workers trained to respect local customs and community norms to prevent social friction.

Record-Keeping and Monitoring

- **Grievance register:** All cases logged with date, category, and resolution status. SEAH/GBV cases recorded separately for confidentiality.
    - **Anonymized logging:** Use restricted-access, password-protected registers or coding systems instead of recording a survivor's name or identifying details.

    - **Strict data limits:** Restrict the recorded details to minimal facts (date, whether the actor is project-related, and if a referral was made)

- **Periodic review:** Monthly analysis of trends and corrective actions by HR/HSE and Project Manager.
- **Reporting:** Summary reports submitted quarterly to the PEU and Barbados Water Authority.
- **Data protection:** All personal data handled per the Barbados Data Protection Act (2019).
    - **Secure physical storage:** Keep any physical notes or intake sheets in locked cabinets accessible only by designated SH/SEA/GBV focal points

Communication and Awareness

- **Orientation sessions:** All workers trained on GRM use, SH/SEA/GBV awareness, and confidentiality principles during induction. Considerations will be made for women-only orientation sessions led by women facilitators where needed, while sessions with PWDs will consider the use of sign language interpretation, large print and/or alt-text materials and text-to-speech applications where relevant.
- **Posters and signage:** Multilingual posters displayed at the camp and work sites showing reporting channels and timelines.
- **Community outreach:** Liaison Officer conducts quarterly sessions with residents explaining how to access the GRM. This is done with the support of or in conjunction with the contractor personnel tasked with social responsibility of the company.

Feedback loops: Regular updates shared with workers and community members on resolved cases and systemic improvements. Noting public feedback on SH/SEA/GBV cases should be anonymized and aggregated (e.g. 'number of cases', 'types of issues', 'general actions taken') without any details that could identify victims or alleged perpetrators.

8.4.13. Health, Safety and Environment (HSE) Management Plan

The contractor's HSE Management Manual (China Railway Shanghai Engineering Group Co., Ltd., Barbados Project Management Department, REV2, 27 August 2026) is reproduced in full as Annex J. It supplements the HSE Management Plan and should be read together with the project-specific risk assessment, emergency preparedness, monitoring and incident-reporting provisions.

8.4.13.1. Purpose of Preparation

To standardize Health, Safety and Environment (HSE) management throughout the entire construction and operation of the new wastewater treatment plant in Barbados; to fully implement HSE control responsibilities for the project; to effectively identify, mitigate and manage risks across all stages of the project, including civil engineering works, equipment installation, pipework laying, tank and structure construction, and temporary electrical works; and to prevent accidents such as personal injury or fatality, damage to equipment, fire or explosion, water pollution and occupational health hazards; to strictly comply with local environmental protection, occupational safety and labor regulations in Barbados, as well as international engineering HSE standards; to safeguard the health and safety of all project personnel; to protect the surrounding ecological environment, marine areas and living environment; to achieve the HSE management objectives of zero fatalities, zero serious injuries, zero

environmental pollution and zero occupational diseases; and to ensure the efficient, compliant and smooth delivery of the project, this Management Plan has been drawn up.

Basis for Preparation

- Local laws and regulations of Barbados: Health Services (Nuisances) Regulations (1969), Health Services (Refuse Collection and Disposal) Regulations (1975), Road Traffic Act, National Oil Spill Contingency Plan, Occupational Health and Safety Act 2005.
- Contract for the Barbados Climate Resilience South Coast Water Reclamation and Re-use Facilities.
- China Railway Shanghai Engineering Group construction site safety management procedures, emergency management system regulations, and relevant environmental management systems and standards.

8.4.13.2. Scope of Application

This plan applies to the entire life cycle of this construction project, covering all phases from preliminary project preparation, the SCWRRF and SCSTP upgrade and refurbishment, workers' camps, on-site construction, testing and commissioning, completion and acceptance, operation, through to the withdrawal of personnel. This plan applies to the full lifecycle of this construction project, covering the pre-construction preparation, on-site construction, testing and commissioning, completion acceptance, operation and maintenance support, and personnel withdrawal stages. The scope of management covers Chinese management personnel, seconded construction workers, locally hired employees, subcontractor teams, equipment operation and maintenance personnel, site visitors, and all third-party personnel entering the construction area; it covers all construction work processes, mechanical equipment, temporary facilities, office and living areas, material storage areas, and commuting transportation.

Management Principles

Adhere to the core principles of safety first, prevention-oriented, comprehensive governance, local compliance, full staff accountability, and full-process management. Implement the accountability system of "whoever manages production must manage safety, whoever manages operation must manage safety." Establish a three-tier safety management system comprising the project management office, construction teams, and subcontractors. Give due consideration to local environmental risks in Barbados, strengthen proactive risk identification, dynamic in-process management, and rapid emergency response, and achieve standardized, localized, routine, and refined safety management.

Management Objectives

- Health Objectives: No group occupational diseases, no construction-related occupational health injuries, no infectious disease transmission; 100% coverage of full-staff health examinations; 100% rectification rate for occupational health hazards.
- Safety Objectives: Eliminate fatalities and serious injuries; eliminate fire, explosion, collapse, electrocution, and confined space suffocation/poisoning accidents; control the minor injury rate to the lowest industry standard; 100% hazard closure and rectification rate.
- Environmental Objectives: Ensure the compliant disposal of construction wastewater, dust, noise and solid waste; prevent any incidents of water, soil or air pollution; protect surrounding wetlands

and coastal marine areas; conservation of ecological processes and ecosystem services; and achieve a 100 percent compliance rate with environmental regulations.

- Social and Gender Objectives: Ensure zero tolerance of SH/SEA/GBV and discrimination, equitable access for women and men to safe working and living conditions, implementation of gender responsive measures.
- Management Objectives: Full coverage of HSE training, full implementation of management systems, comprehensive inspections, fully controllable emergency response; successful passage of all HSE audits and inspections by the Employer and local regulatory authorities.

8.4.13.3. Project HSE Organizational Structure and Job Responsibilities

Organizational Structure

In accordance with the Barbados Safety and Health at Work Act (CAP 356), workplaces with 75 or more employees are required to establish a Safety and Health Committee. The number of workers on the sewage treatment plant construction project exceeds 75 at peak times; therefore, a committee must be established in accordance with the law. Furthermore, in line with common industry practice, the Safety Committee is typically chaired by the Project Manager and comprises the heads of each department and the representatives of subcontractors, supported by HSE management personnel (members of the Health, Safety and Environment Department and HSE specialists) to implement the HSE accountability framework.

The Project HSE and Work Safety Management Committee, chaired by the Project Manager, is responsible for coordinating health and safety management for all project personnel; a dedicated HSE management department is established, staffed with a sufficient number of full-time safety management personnel, and safety officers are deployed in accordance with the scale of construction. A four-tier management network is established, comprising the Project Manager as the overall supervisor, HSE specialists providing oversight, the Health, Safety and Environment Department responsible for implementation, subcontractors providing support, and the participation of all personnel, covering all construction areas and operational phases of the project. Subcontractors must appoint a safety officer and be integrated into the project's unified safety management system.

Figure 79 shows the organizational structure of the Project HSE and Work Safety Management Committee.

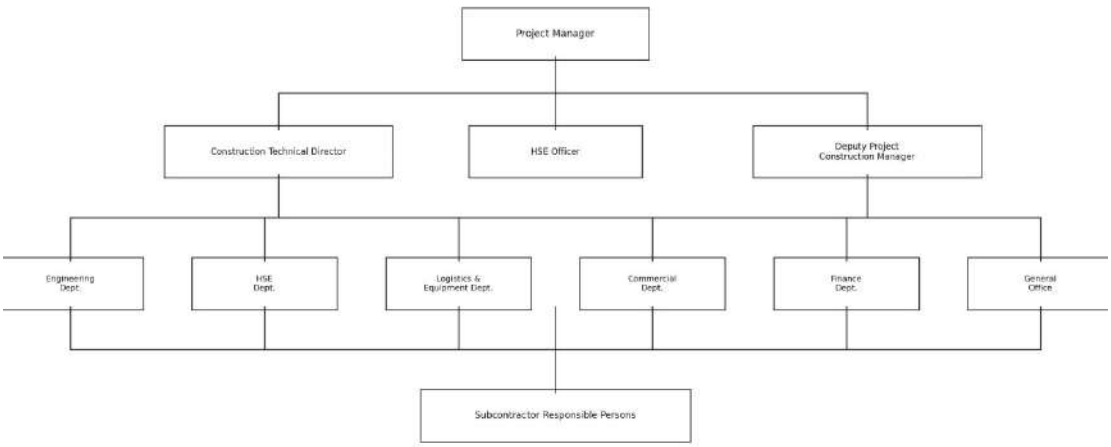


Figure 79: Organizational structure of the Project HSE and Work Safety Management Committee

Core Job Responsibilities

Project Manager (First Person Responsible for HSE)

Bears full responsibility for the overall management of project health and safety. Reviews and approves the HSE Management Plan, specialized safety plans, and emergency response plans. Coordinates compliance with local requirements and resolves major safety risks, resource allocation, and government-enterprise interface issues for overseas projects. Organizes safety special meetings, hazard rectification, and emergency drills, and bears overall responsibility for production safety and occupational health of the project.

HSE Officer

Responsible for the day-to-day implementation of project HSE management. Leads risk identification, assessment, and control. Supervises on-site PPE wearing, operational compliance, equipment safety, and environmental management. Conducts daily HSE inspections and hazard investigations. Leads preliminary accident investigations and follows up on rectification measures. Reports HSE work progress to the Project Manager and the company. This role is to be filled by one person, appointed by the main contractor from a local safety and environmental consultancy team.

HSE Department

Responsible for the on-the-ground implementation of this plan. Conducts daily safety inspections, risk identification, and hazard investigation and rectification. Organizes full-staff safety training, technical briefings, and pre-shift safety activities. Manages construction site protective facilities, labor protection equipment, and mechanical equipment safety. Establishes HSE management records, reports safety data, hazards, and accident situations. Supervises subcontractors and local employees in safe operations and implements local safety regulation rectification requirements. Enforcement of the zero-tolerance policy on SH/SEA/GBV and discrimination and oversight of social and gender aspects of the project. The department's staffing comprises members of the main contractor's project Health, Safety and Environment Department and safety officers from subcontractors, with a minimum of two permanent staff members. Key positions include the Head of the Health, Safety and Environment Department, social and gender personnel and the subcontractor safety officers.

Subcontractor Managers

Implement daily pre-shift safety briefings and work risk notifications, and manage the on-site behavior of their work teams. Investigate immediate safety hazards in their work areas and stop instances of illegal command, illegal operations, and violations of labor discipline. Organize work team members to properly wear labor protection equipment and bear primary responsibility for safety accidents and health issues in their subcontracted areas. Cooperate with the project management office to complete rectification and emergency response work. Strictly construct in accordance with specialized plans and immediately report on-site sudden safety issues and abnormal health conditions.

All Operating Personnel

Strictly comply with project safety and health management systems and local operating standards. Participate in safety education training and emergency drills. Properly wear labor protection equipment and eliminate the "three violations" (illegal command, illegal operation, violation of labor discipline).

Proactively identify job-related risks, promptly report hazards and abnormalities, and consciously comply with occupational health protection requirements.

8.4.13.4. Communication Channels between All Parties

(1) Internal Communication Channels

Table 158 presents the HSE communication channels.

Table* 158*: HSE Communication Channels

Channel Type	Specific Method	Frequency	Target Audience
Monthly Safety Briefing	Joint meeting of all specialist departments to coordinate safe construction arrangements and discuss risks associated with overlapping operations	Once a month	Project Manager, heads of all departments, and project supervisors from each subcontractor
Pre-shift Briefing	A brief safety briefing held 5–10 minutes before the start of work each day, conducted by the foreman and inspected and recorded by the safety officer	Daily, before work commences	All team members
HSE Specialized Regular Meetings	Internal weekly HSE team meeting to summarize inspection findings and track the progress of hazard rectification	Once a week	All HSE department staff
On-site safety inspections	HSE staff conduct daily on-site inspections; any potential hazards identified are immediately reported to the person responsible for rectification	At least two comprehensive inspections per day	HSE staff/team leaders

(2) External Communication Channels

The Department of Emergency Management (DEM) of Barbados operates a real-time disaster warning system on its website; construction safety information may be disseminated via this platform as appropriate.

Table 159 presents the external communication channel.

Table** 159**: External Communication Channel

(3) Emergency Communication Channels

Communication Recipients	Key communication channels	Communication Content
Client (BWA)	Formal report emails, monthly HSE reports, immediate telephone notification of incidents (followed by a written report within 24 hours)	HSE performance, incident reports, corrective action plans, implementation status of the C-ESMP
Inter-American Development Bank (IDB)	Formal correspondence, quarterly compliance reports, ESIA/ESMP implementation reports	Compliance with environmental and social protection policies, notification of significant incidents, status of grievance handling
Ministry of Labour, Barbados	Submission of written reports as required by law (notification 7 days prior to commencement of works; immediate reporting of incidents involving absences exceeding 3 days)	Notification of commencement of works, accident reports (including fatal and serious injury accidents, which must be reported by telephone within one hour), compliance information
Ministry of the Environment, Barbados	Submission of environmental compliance reports and water quality monitoring reports in accordance with approval conditions	Wastewater discharge monitoring, hazardous waste disposal records, implementation of wetland protection measures
Ministry of Emergency Management, Barbados	Coordination of hurricane/heavy rain warnings, liaison on emergency response	Receipt of disaster warnings, emergency coordination, and cooperation with personnel evacuation
Community/Public	Complaints helpline, complaint registration points, regular visits by community liaison officers (in accordance with the ESIA public consultation commitments and IDB information disclosure requirements)	Notification of construction impacts, handling of complaints and feedback on their resolution, information on public inquiries

The project team must establish a 24-hour emergency communications network, covering the Project Manager, HSE Manager, Security Manager, camp medical center, the client's emergency contact, the A&E department of the nearest hospital, and the Barbados Fire Service/Police Service. All contact lists must be displayed in prominent locations within office areas, construction sites and camps, and updated promptly as personnel changes occur.

HSE Management System Development

In combination with Chinese work safety standards, Barbados laws and regulations, and Employer's HSE requirements, a standardized management system adapted to local construction scenarios shall be established to ensure that management has rules to follow, evidence to check, and full-process traceability. The core systems are as follows:

1. **Work safety responsibility system and performance management system, defining HSE accountability standards and reward and penalty mechanisms for all positions.**

This system aims to break down the project's HSE objectives to every individual role through a 'responsibility cascade mechanism'. The core of this system is to define the specific HSE performance standards for project management personnel. The assessment component requires the establishment

of a ‘monthly HSE performance appraisal system’, linking assessment results directly to remuneration and commendations. This creates a closed-loop accountability system where ‘the burden of safety is shared by all, and everyone has targets to meet’, while complying with the general requirements of Barbados’ Work Safety and Health Act regarding the employer’s duty to ensure a safe and healthy workplace.

2. **Construction site risk identification, tiered management and control, and hazard investigation and rectification management system.**

This system requires the implementation of a “dual prevention mechanism”, combining risk identification with hazard investigation. Firstly, a “dynamic risk register” should be established, with systematic hazard identification (HAZID) carried out during the project planning and construction phases, and a job safety analysis (JSA) prepared for each high-risk operation. Secondly, the “risk matrix method” must be adopted to classify the identified risks and implement differentiated control measures. Hidden hazard inspections should be carried out through a three-tier inspection system comprising ‘daily, weekly and monthly inspections. A register must be maintained for all identified hazards, which are to be managed according to a closed-loop process of ‘identification – registration – rectification – acceptance – closure’. The results of risk classification should directly guide the focus and frequency of hidden hazard inspections.

3. Permit management systems for special operations including work at heights, hot work, temporary electrical operations, lifting operations, and confined space operations.

This system serves as the core safeguard against major casualty accidents. A “work permit system” must be implemented for work at height, hot work, temporary electrical work, lifting operations and work in confined spaces. Procedurally, the application should be submitted by the person in charge of the operation; following an on-site inspection by the safety officer to confirm that safety measures are in place, the permit shall be issued by the project manager or their authorized representative. The permit must clearly specify the scope of work, timeframe, risk points, safety protection measures and emergency arrangements. Particular attention must be paid to the principle that ‘no work may be carried out without a permit’; any unauthorized work shall be regarded as a serious breach. Permit management requirements must align with the regulatory priorities of the Barbados Ministry of Labour regarding high-risk construction projects.

4. Mechanical equipment, temporary electrical work, and construction tools safety management system.

These regulations are designed to ensure that all construction equipment remains in a safe condition at all times. Key requirements include: equipment must pass acceptance inspection prior to entry onto site, and operators must have completed approved training before being permitted to operate it. Temporary electrical systems must comply with the principle of ‘three-level power distribution and two-level earth leakage protection’, and must be fitted with earthing protection. The HSE Manager shall carry out daily inspections of equipment to ensure there are no fluid leaks and that safety devices are in working order. Barbadian legislation explicitly requires employers to ensure the safety of equipment and to prevent harm to employees and the public.

5. Occupational health protection, health examination management, and occupational disease prevention and control management system.

This system focuses on full-cycle occupational health surveillance. Firstly, a system of pre-employment, periodic (annual) and post-employment medical examinations must be established. Secondly, occupational health hazards within the project, such as dust, noise, high temperatures, and toxic or harmful gases, must be identified, and engineering control measures, such as ventilation and noise reduction, must be implemented. Furthermore, employees exposed to such hazards must be provided with, and the use of, approved personal protective equipment must be supervised. At the same time, consideration must be given to the risk of local mosquito-borne diseases (such as dengue fever and Zika virus).

CRSEG confirmation (November 2026): Newly recruited staff undergo an occupational health examination, employees receive annual occupational health check-ups, and an exit examination is undertaken on leaving employment. Individual health records are established and workers with medical contraindications are reassigned from hazardous duties. The applicable Barbados statutory examination, certification, confidentiality and record-keeping requirements remain binding; this statement does not by itself establish that every individual examination has been independently verified.

6. On-site civilized construction and environmental hygiene management system.

This system must coordinate construction activities with the community and the environment. Within the construction area, ‘rigid hoardings’ and ‘safety warning signs’ must be installed, and pollution control measures, such as water sprinkling to suppress dust and noise reduction, must be implemented to minimize the impact on surrounding communities. Site environmental management should also include the centralized treatment of construction and domestic wastewater, as well as measures to prevent leaks of oils and chemicals. Furthermore, a ‘community complaints and feedback mechanism’ should be established to promptly address neighborhood disputes arising from construction noise, dust and mosquito breeding, thereby demonstrating a commitment to community health and safety.

7. Safety access and education and training management system for cross-border personnel, local employees, and subcontractors.

This system serves as a ‘gatekeeper’ mechanism to ensure that all site personnel possess basic safety literacy. Firstly, all personnel (including cross-border staff, local staff and subcontractors) must complete ‘three-level safety training’, the content of which must cover project-specific risks (such as high temperatures, insect control and hurricane response). Secondly, personnel engaged in high-risk operations must undergo specialized skills training and assessment. The system should clearly stipulate the principle of ‘no training, no work’ and establish ‘training records. Ensure that all personnel are capable of identifying workplace hazards.

8. Emergency management, accident reporting, and response management system.

This system must establish a comprehensive mechanism covering the entire process from on-site response to official reporting. On the one hand, specific emergency response plans should be drawn up for incidents such as fires, collapses, chemical leaks, heatstroke and natural disasters such as hurricanes, and regular drills should be organized. On the other hand, the accident reporting procedures, as well as the methods and reporting requirements for accident investigations, must be clearly defined to ensure corrective actions are implemented and prevent similar incidents from recurring.

9. Camp living and public health and safety management system.

The camp living and public health and safety management system is the set of camp rules, accommodation and hygiene standards, inspections and records through which the Camp Manager and the HSE Representative manage living conditions and public health at the camp, drawing on Section 10.4 (Living Environment and Hygiene Management) of the Contractor's HSE Management Manual and on the Health Services (Accommodation and Barracks) Regulations, 1970. It covers room allocation and occupancy, separate and lockable accommodation and sanitary facilities for women, drinking water quality, food procurement, storage and canteen hygiene, waste and wastewater management, vector control, fire safety, medical care and first aid, and the camp rules on visitors, curfew and alcohol, with weekly inspections by the HSE Representative and records kept for audit. These regulations form the foundation for safeguarding workers' physical and mental well-being and ensuring community harmony. Campsite planning must be approved by the relevant authorities in Barbados to ensure the provision of adequate and safe drinking water, hygienic bathing facilities, and effective waste and sewage treatment. With regard to public health and safety, strict standards for food procurement, processing and storage must be established to prevent foodborne illnesses; standing water must be cleared and insecticides sprayed regularly to control the spread of mosquito-borne diseases such as dengue fever.

10. HSE record-keeping, inspection and assessment management system.

This system forms the basis for ensuring the traceability and verifiability of the HSE management system. It requires the establishment of a comprehensive HSE record-keeping system for the project, covering all key documents such as training records, inspection reports, meeting minutes, incident reports, equipment maintenance logs and licenses. Record-keeping management must clearly define the classification, coding, version control, filing and retention periods for documents. Furthermore, this system must document the results of regular internal inspections and external audits, which serve as the basis for management reviews and performance assessments, thereby driving the continuous improvement and enhanced effectiveness of the HSE management system.

8.4.13.5. Construction Site Safety Risk Identification and Control

CRSEG response on high-risk activities (November 2026): Lifting and hoisting hazards are addressed by Section 7.3, Lifting and Hoisting, and submersion emergencies by Section 12.2.1, Emergency Response to Drowning, and Section 12.2.12, Emergency Response to Flooding, in the August 2026 HSE Management Manual (REV2) reproduced at Annex J. Site-specific work permits, risk assessment and rescue arrangements shall apply to both activities.

Scope of Risk Identification

Given the special nature of overseas construction in Barbados, a comprehensive identification shall be carried out of occupational health risks, construction safety risks, and environmental protection risks, covering the entire construction process. Focus shall be placed on unique risks including high-risk operations, overseas extreme weather, local infectious diseases, public security hazards, and cross-border operational compliance.

Control of Key High-Risk Operations

The principle of prior approval before special operations shall be strictly enforced, work permit systems implemented, and operational risks dynamically updated.

- Work at Heights: Compliant protective scaffolding, protective railings, and safety nets shall be erected. Workers shall wear safety harnesses throughout, and exclusion zones shall be established

below. Overhead throwing of materials, unauthorized operations, and non-compliant climbing shall be prohibited. Work at heights shall be prohibited in winds of Beaufort Force 6 or above, heavy rain, and dense fog.

- Hot Work: Flammable and explosive materials in the work area shall be cleared, sufficient fire-fighting equipment and fire monitors provided, hot work permits obtained, fire-catching measures implemented for hot work at height, and post-work inspection carried out to confirm no fire hazards.
- Temporary Electrical Operations: Three-level distribution and two-level protection shall be strictly enforced, cables laid in a compliant manner, private connections strictly prohibited, distribution boxes locked and weatherproofed, and dedicated electricians responsible for wiring, maintenance, and inspections, eliminating unauthorized live operations.
- Lifting and Hoisting Operations: Lifting equipment shall be regularly tested and calibrated, rigging and slings verified as compliant and intact, lifting exclusion zones established, and dedicated signalers and monitors appointed. Overloading, oblique pulling, and forced dragging shall be prohibited. Lifting operations shall be suspended in adverse weather. A lifting plan shall be prepared for each hoist of large pipes, equipment, reinforcement or concrete hoppers, with one appointed person in charge, trained signalers and riggers and standardized signals (HSE Management Manual, Annex J, Section 7.3).
- Confined Space Operations: Ventilate first, then test, then operate. Continuous gas monitoring and dedicated supervision throughout. Emergency rescue equipment shall be provided. Strict management of operational time limits and blind rescue attempts shall be prohibited.
- Flooding Risks: Construct adequate drainage systems as required to mitigate flood risks in the construction area; schedule major earthworks during the dry season to avoid soil erosion during periods of heavy rainfall; suspend excavation work during rainfall and implement measures to prevent landslides; and regularly clear drainage ditches to ensure they remain unobstructed. In terms of emergency coordination, weather forecasts must be monitored in real time; following a heavy rain warning, excavation of foundation pits and utility trenches must be suspended immediately, and preparations for activating pumping equipment and evacuating personnel must be initiated.
- Submergence Risk: Work in excavations, pits, tanks and channels near the Graeme Hall Swamp, the wetland conveyance or areas of high groundwater shall be assessed for the risk of sudden water inflow and submersion before it starts, and carried out under a work permit. Controls include dewatering and continuous water-level monitoring, shoring with safe access and egress, no lone working, a standby person at the edge, and life jackets, lifebuoys and rescue ropes at the work face. Work stops on a heavy rain warning or any rise in water level, and the drowning emergency procedure of the HSE Management Manual (Annex J, Sections 12.2.1 and 12.2.12) applies.

Comprehensive Environmental Risk Management by Country

- Climate Risks: For local extreme weather including high temperatures, heavy rain and the like, specialized management plans shall be developed. Outdoor high-risk operations shall be suspended during extreme weather, and equipment protection, heatstroke protection for personnel, and camp wind and rain protection measures implemented.

- Public Health Risks: Local infectious and endemic disease risks shall be surveyed in advance. Camp disinfection and pest control, drinking water safety, and food hygiene management shall be enforced. Epidemic prevention supplies shall be stockpiled, consumption of unsafe food prohibited, and personnel exhibiting symptoms such as fever and fatigue immediately isolated and referred for medical treatment.
- Local Security Risks: Liaison with local security departments and partner organizations shall be maintained. Closed management of construction sites and living areas shall be implemented, with security personnel on guard. Unauthorized entry of unrelated personnel and external vehicles shall be prohibited. Personnel external movement reporting procedures shall be standardized to avoid security disputes and foreign-related safety risks.

Mechanism for Identifying and Rectifying Hidden Hazards

The project's hazard identification and rectification mechanism operates through three core components: a five-tier inspection system, tiered control measures, and closed-loop management.

The five-tier inspection mechanism covers the entire project lifecycle at varying frequencies and levels. Each work team conducts a daily pre-shift self-inspection of safety safeguards at the work area, the wearing of PPE and the condition of tools; HSE managers carry out daily comprehensive patrols of high-risk work sites, correcting any breaches immediately upon discovery; the project department organizes weekly specialized inspections, focusing on one high-risk theme each week (such as work at height, temporary electrical installations, lifting operations, etc.);the project manager leads a comprehensive monthly inspection of the entire site, covering compliance with regulations and the completeness of records across construction, living and office areas; and before public holidays and the start of the hurricane season, a thorough, grid-style inspection is carried out, focusing on drainage systems, the reinforcement of temporary facilities and the stockpiling of emergency supplies.

Hidden hazards are categorized into two levels of severity: major hazards (which may result in death, serious injury or significant environmental pollution) require immediate suspension of work for rectification; general hazards must be rectified within three days.

The closed-loop rectification mechanism is implemented in five steps: 'Identification → Registration → Rectification → Re-inspection → Closure'. Upon discovery of a hazard during an inspection, photographs are taken for record-keeping and the details are entered into the register, clearly specifying the person responsible for rectification, the measures to be taken and the deadline. Once rectification is complete, the HSE supervisor must carry out a re-inspection and acceptance within 24 hours; the item may only be closed and archived upon passing the inspection. Major hazards must be assessed on-site by the project manager, who must draw up a specialized plan and supervise the rectification process throughout; a work resumption order is issued only upon successful acceptance. As Barbados is situated in a hurricane corridor, during heavy rain warnings, drainage systems must be cleared in advance, slope supports reinforced and the stability of excavation pits checked. Before resuming work after rainfall, a comprehensive inspection of the electrical systems and site safety must be carried out before operations can resume.

8.4.13.6. Occupational Health Management

Personnel Health Access Management

All Chinese seconded personnel shall complete comprehensive medical examinations before departure to identify conditions such as cardiopulmonary diseases, infectious diseases, and chronic diseases that are unsuitable for overseas construction. Only those who pass their medical examination may commence work. Local employees shall undergo health screening before employment to prevent persons with occupational contraindications from undertaking relevant work. A comprehensive health file for all staff shall be established, with dynamic updating of medical records, health status, and treatment records.

a. Standards for Classification of Medical Examinations

All personnel must complete a pre-employment occupational health and safety examination before entering the camp, construction or operational areas. The examination shall screen for conditions unsuitable for tropical construction work, such as cardiovascular and respiratory diseases, infectious diseases, chronic conditions and heat stress tolerance. Local employees must undergo a health screening at a locally recognized institution prior to commencing employment; they may only undertake the relevant work after confirmation that they have no occupational contraindications.

b. Compliance with Statutory Requirements for Medical Examinations

All medical examination costs shall be borne by the employer and must not be passed on to employees in any form. Medical examination records shall be retained by the employer, who must establish health files for all staff and dynamically update medical examination records, health status and medical treatment information.

c. Regular Medical Examinations and Special Protection

Employees must undergo an occupational health review at least once a year. Furthermore, the provisions of Article 73 of CAP 356 must be strictly adhered to; the employment of women and young people in lead manufacturing and related processes is strictly prohibited. For roles involving occupational health hazards such as dust, noise, high temperatures and confined spaces, the intervals between medical examinations must be appropriately shortened in accordance with the level of exposure. All medical examination findings must be communicated to the employee in writing, and those with occupational contraindications must be reassigned to suitable roles without delay.

d. Occupational Health and Safety Protection during Construction and Operations

For occupational hazard factors including dust, noise, high temperatures, toxic and harmful gases, and strong light radiation, specialized protective measures shall be implemented. Ventilation, dust removal, and noise reduction equipment shall be installed in work areas. Sufficient labor protection equipment including safety helmets, non-slip safety footwear, protective masks, dust respirators, noise-reducing earplugs, protective gloves, and protective clothing shall be provided for workers. Full compliance in wearing and regular replacement shall be supervised, and unprotected operations strictly prohibited.

e. Head Protection

Safety helmets must comply with the ANSI Z89.1 standard and must be worn at all times when working in areas where there is a risk of being struck by falling objects, collisions or electric shock. The service life of a safety helmet is generally 24–36 months, subject to adjustment based on the degree of wear and tear during use; helmets must be replaced immediately in the event of a severe impact or the appearance of cracks.

f. Foot Protection

Non-slip safety footwear must comply with the ASTM F2413 standard and be equipped with impact-resistant, puncture-resistant and slip-resistant features; it is mandatory for all on-site personnel. Footwear must be replaced immediately if the soles are severely worn, the toe cap is deformed or the anti-slip tread is worn smooth; the typical service life is 12–24 months.

g. Respiratory Protection

Dust masks and respirators shall be selected according to dust concentration; respiratory protective equipment must be provided to staff where an assessment confirms the presence of a hazard. Work involving silica dust, cement dust, welding fumes and similar hazards requires the wearing of N95 or higher-grade dust masks; in confined spaces or areas containing toxic or harmful gases, gas masks fitted with filter cartridges must be worn. Disposable masks must be replaced every 4 hours or immediately if they become damp; filter cartridges must be replaced regularly in accordance with the operating environment and the manufacturer's instructions.

h. Hearing Protection

Noise-reducing earplugs or earmuffs must be used in areas where noise levels exceed the permissible limits; the project's ESMP explicitly requires that operators of high-noise equipment be provided with noise-reducing earmuffs. Earplugs are consumables and must be replaced as soon as they become soiled or lose their elasticity; earmuffs are generally replaced every 6–12 months but must be replaced immediately if the padding is damaged.

i. Hand Protection

Protective gloves must be selected according to the nature of the work (cut-resistant, acid and alkali-resistant, insulated, etc.), and must be worn when handling chemicals. Gloves must be replaced immediately if they are torn, severely worn or have come into contact with corrosive substances.

j. Personal Protective Equipment

Protective clothing (including high-visibility vests) must be worn in all work areas to ensure personnel are visible. It must be replaced if it is damaged, severely soiled or if the reflective strips are no longer effective.

k. Eye and Face Protection

Safety goggles or face shields must be worn when carrying out work involving dust, intense light radiation (such as welding arcs) or chemical splashes. Lenses must be replaced immediately if they become scratched to the extent that they impair vision, or if the face shield becomes deformed.

All PPE must be fully provided and paid for by the contractor, who must establish a record of issue and collection, as well as a system for regular inspection and replacement, and ensure that all personnel wear it correctly; working without protective equipment is strictly prohibited.

Daily Health Management

- **Construction camps shall be managed to standardized requirements to ensure dormitory ventilation, lighting, and sanitary cleanliness. Regular disinfection and pest control shall be carried out to eliminate mosquito breeding and pathogen transmission.**

Regarding standardization requirements for camp facilities, the camp shall be constructed in accordance with the plan approved by the Government of Barbados, providing workers with temporary sanitary facilities that meet the required standards, while maintaining good hygiene and carrying out necessary repairs.

With regard to standardized regular disinfection and pest control: the site environment shall be sprayed with insecticide once a month; drainage channels shall be kept clear and free of standing water to prevent the breeding of mosquitoes; during peak mosquito seasons (April–June and September–November each year), mosquito control and disinfection shall be carried out at least once a month; Cockroach control agents shall be applied monthly in canteens and dormitories, while rodenticides (such as bromadiolone and bromadiolone) shall be deployed in accordance with the 'three-saturation' principle; rodent carcasses shall be collected and disposed of centrally 5–7 days after application; all chemicals used must be public health pesticides authorized for use in Barbados.

With regard to standardized daily maintenance, domestic waste must be sorted and collected in leak-proof containers and removed regularly; kitchen waste water must be treated in grease traps before being discharged into the camp's sewage system. All living areas must be kept free of pests such as rats, lice, bedbugs, cockroaches and flies, both indoors and outdoors.

- **2. Food safety in the canteen shall be strictly managed, with food procured in compliance with regulations, stored by category, raw and cooked foods processed separately, utensils regularly disinfected, and group incidents of food poisoning and gastrointestinal illness prevented.**

All food ingredients are sourced locally, with perishable items such as red meat, white meat and fish purchased from supermarkets such as Chapside Market or Cost U Less. During procurement, insulated boxes are used to ensure low-temperature transport; upon arrival at the project site, the goods are immediately stored in designated sections of the refrigerators for chilled or frozen storage, thereby fully ensuring a closed-loop cold chain for fresh produce and meeting food safety management requirements.

- **Construction shifts shall be arranged reasonably, with strict control of fatigue and overtime work. Staggered construction schedules and heatstroke prevention and cooling measures shall be implemented during hot weather, with heatstroke medicines and drinking water provided.**

(1) Regarding shift arrangements, the project draws on international experience from similar construction projects in tropical regions and implements a 'work early and late, rest in the middle' staggered working pattern, concentrating core construction tasks during the early morning and evening when temperatures are relatively moderate. The period from 12:00 to 15:00 is designated as a high-temperature work suspension period, during which workers are required to extend their lunch break and delay the resumption of afternoon work.

(2) Regarding shift duration and working hour standards, the project complies with the provisions of Barbados' Employment Rights Act, with a daily working day of 8 hours. Outdoor work must be suspended when temperatures reach 38°C or above to prevent excessive working hours and fatigue.

(3) With regard to dynamic adjustments based on weather conditions, the project department monitors high-temperature warnings issued by the Barbados Meteorological Service on a daily basis. When temperatures exceed 35°C, work in direct sunlight is strictly controlled; when temperatures exceed 38°C, outdoor work is suspended, and heatstroke prevention medication and drinking water are provided.

- **Regular occupational health awareness education shall be conducted to disseminate knowledge of occupational disease prevention, infectious disease prevention, and emergency first aid, enhancing all-staff self-protection capacity.**

(1) Content of the training program

The educational content must cover three main areas: prevention and control of occupational diseases (identification of hazards and protective measures relating to dust, noise, high temperatures, toxic and harmful gases, and intense light radiation); prevention of infectious diseases (control of mosquito-borne diseases such as dengue fever and Zika, food and water safety, and malaria prevention and control); and emergency first aid knowledge (cardiopulmonary resuscitation, handling of trauma patients, and first aid for heatstroke).

(2) Trainers and Venue

Instructors must be qualified professionals: the sections on occupational disease prevention and control and infectious diseases shall be delivered by the project HSE manager or a certified occupational health and safety specialist engaged for this purpose; first-aid skills shall be taught through practical guidance by the project department's doctor. Venue: Theoretical training shall take place in the project department's conference room; practical training shall be conducted in an open, safe area on the construction site; on-site briefings for work teams shall be held directly at the work area.

(3) Format and Grouping Method

A three-tiered, tiered training approach shall be adopted, with groups organized by job category:

Table 160 presents the three-tiered training approach.

Table 160***: Three-tiered training approach***

Level	Target Audience	Format	Grouping Method
Lectures for all staff	All site personnel (including cross-border staff, local staff and subcontractors)	Classroom instruction + video-based learning + case studies	Classes organized by camp or work area, with no more than 50 participants per class
Specialized Intensive Courses	Personnel engaged in high-risk operations such as work at height, confined spaces and hot work; personnel exposed to high noise levels and dust	Practical exercises + on-site demonstrations + written assessment	Grouped by trade or type of work, with 10–15 people per group
On-site briefing for work teams	All team members	5–10-minute pre-shift briefing	Organized by work team, to be conducted daily by the team leader or safety officer

(4) Frequency schedule

Specific frequency: Complete induction safety training for all staff (including three-tier safety education) prior to commencing work; conduct at least one specialized training session per quarter (rotating through the three major areas by topic); conduct one annual refresher course on first-aid skills and a joint inspection; hold a 5-minute on-site briefing before each shift.

(5) Records and Assessment

Attendance records, training materials, assessment results and video footage must be retained for all training sessions; training records shall be incorporated into the HSE ledger management system. Personnel in high-risk roles must pass both written and practical assessments before being permitted to take up their posts; those who fail the assessment must undergo retraining. Assessment results shall be recorded in individual training files and reviewed periodically.

Health Monitoring and Medical Support

Construction camps shall stock sufficient first-aid medicines, epidemic prevention supplies and emergency medical equipment, and shall establish a temporary on-site medical room staffed by medical personnel; A partnership has been established with the local accredited Queen Elizabeth Hospital (contact number: +1 (246) 536-4500) to create a green channel for emergency medical care; in the event of an emergency, the project department will arrange transport to the hospital using its own vehicles; regular health re-examinations shall be organized for all staff, with a focus on monitoring those engaged in high-risk work over the long term; should any occupational health abnormalities be detected, the individual shall be immediately reassigned, treated and subject to follow-up monitoring.

Overall Emergency Response Flowchart

The response process is carried out in five steps: 'Detection → Assessment → Response → Evacuation → Reporting':

Table 161 presents the emergency response flowchart.

Table 161***: Emergency Response Flowchart***

Step	On-site Personnel	On-site Manager/HSE Manager	Camp Medical Center	External organizations
1. Detection and Alert	Identify the injured person → Assess the injury → Call for help immediately → Report to the HSE Manager	Receive the report → Assess whether to activate the emergency response plan	Stand by and prepare first-aid supplies	—
2. First Aid at the Scene	If qualified in first aid, assist with rescue efforts	Arrive at the scene to take charge; organize the evacuation of onlookers	Dispatch medical staff with a first-aid kit to the scene; perform CPR, stop bleeding and apply dressings	—
3. Injury Assessment and	Assist with first aid	Confirm the severity of injuries	Assess vital signs and determine	—

Step	On-site Personnel	On-site Manager/HSE Manager	Camp Medical Center	External organizations
Triage		(minor/serious/critical)	whether hospital admission is required	
4. Transport Arrangements	Assist with transport	Contact the designated hospital; arrange a vehicle or ambulance	Accompany the patient in the vehicle and provide continuous monitoring enroute	Admission of the patient to the hospital's A&E department
5. Information Sharing	—	Notify family members/emergency contacts; report to the client and the Ministry of Labour	Explain the nature of the injury and the course of treatment to the attending doctor upon handover	Admit the injured person; provide feedback on the diagnosis
6. Follow-up	—	Monitor the progress of treatment; arrange for staff to cover the injured person's duties	Follow up on the injured person's recovery	Issue medical certificates detailing the nature of injuries

Note: Injury classification criteria. Minor injuries (can be treated with first aid at the scene; no hospitalization required), serious injuries (require hospital treatment but are not life-threatening), critical injuries (life-threatening; require emergency resuscitation). Upon discovering an injured person, personnel at the scene should provide assistance while ensuring their own safety and avoiding secondary injuries.

Matrix of Responsibilities

Table 162 presents the matrix of responsibilities.

Table 162***: Matrix of Responsibilities***

Role	Emergency Response Responsibilities	Day-to-day preparation responsibilities
Project Manager	Declare the activation of the emergency response plan; coordinate internal and external resources; report major incidents to the client and the client's representative	Approve the emergency management budget; sign off on emergency drill plans
HSE Manager	On-site command; liaising with the fire service, police and hospitals; confirming the identity and condition of injured persons	Organize emergency drills; manage medical supplies stockpiles; update the emergency contact list
Camp Medical Staff	Administer first aid on site; assess and triage injuries; accompany patients during transport	Manage first-aid medicines and equipment; carry out regular re-examinations; conduct health monitoring
Team Leader	Organize the evacuation and headcount of	Attend emergency response training;

Role	Emergency Response Responsibilities	Day-to-day preparation responsibilities
	their team; report incidents immediately	communicate emergency evacuation routes and assembly points to the team
Security Staff	Maintain order at the scene; direct traffic; guide ambulances at the camp entrance	Assist in setting up signage for evacuation routes; ensure emergency access routes remain clear

8.4.13.7. Management of Evacuation Routes and Assembly Points

(1) Evacuation route signage: The camp must display a bilingual (Chinese and English) site plan in a prominent location, with escape routes marked by red arrows; these routes must be kept clear.

(2) Designation of Assembly Points: One safety assembly point shall be established at the campsite, equipped with a headcount register, a public address system and a first-aid kit.

(3) Evacuation Instructions: A 'Stop Work Alarm' must be broadcast via the public address system; all personnel must cease work, switch off equipment and proceed to the assembly point via the nearest route for a headcount.

(4) Evacuation map: the evacuation routes and emergency assembly points are shown in the map in Section 8.4.13.13, which is displayed at the camp and explained to every worker at induction.

8.4.13.8. Procedure for Tracking Injured Persons

Table 163 presents the procedure for tracking injured persons.

Table** 163**: Procedure for tracking injured persons

Phase	Responsible Party	Specific Actions
On-site Response	Camp medical staff/HSE Manager	Record the injured person's name, employee number, job title, time of injury, location of injury, preliminary assessment and on-site treatment measures
Transfer and handover	Escort personnel	Submit the 'Injury Handover Form' to the attending doctor; record time of admission and preliminary diagnosis
During hospitalization	HSE Manager (or their designated representative)	Liaise with the hospital daily to monitor the patient's condition; inform the project manager of any changes in the patient's condition; arrange language assistance (e.g. Chinese expatriate staff);
Discharge and Rehabilitation	HSE Manager + General Affairs Office	Obtain discharge certificates and rehabilitation recommendations; arrange for sick leave or redeployment; record the employee's health status during rehabilitation
Return-to-work assessment	Camp Medical Staff	Conduct pre-return-to-work health checks; confirm suitability for the original role; if unsuitable, propose a job reassignment

8.4.13.8.1. Post-Hospitalization Procedures

Admission arrangements: The camp must enter into a medical cooperation agreement in advance with a nearby accredited hospital. As the project's area of influence is adjacent to the south coast, the nearest large public hospital is Queen Elizabeth Hospital, which has a total of 554 beds and provides comprehensive services including A&E, surgery and intensive care; it may serve as the preferred referral hospital. The emergency center also provides on-site first aid and transport services.

Costs: All medical expenses for personnel injured while on duty shall be borne by the employer (covered by work injury insurance or the project budget), in accordance with the basic requirements of the Barbados Safety and Health at Work Act.

Accompaniment: When an injured person is taken to hospital, they must be accompanied by a person familiar with the circumstances of the accident, who will provide the attending doctor with background information on the injury and assist with completing medical documentation.

Notification: The employer must be notified within one hour of admission, and family members or emergency contacts must be informed promptly.

Emergency Supplies: In accordance with the project's ESIA/ESMP requirements, the construction site must be equipped with adequate first-aid supplies, including equipment required for resuscitating unconscious casualties and stretchers, with the management of emergency supplies supervised by a qualified occupational health and safety officer.

8.4.13.9. Procedures for Handling Fatal Incidents

The Barbados Health Services Act, Cap. 44, and its 2025 amendments provide the legal framework for the disposal of human remains. The project must comply with the following procedures:

Table 164 presents the fatal incident procedure.

Table** 164**: Fatal Incident Procedure

No.	Step	Specific Action	Responsible Party
1	Securing the Scene	Immediately halt all work in the area; secure the scene and do not move any equipment or the body without authorization; await the arrival of the police and professional emergency medical personnel	HSE Manager/Security
2	Confirmation of Death	Death must be confirmed by a registered doctor or a coroner; personnel at the scene are not authorized to determine death	Medical staff/hospital
3	Immediate Reporting	The project manager must notify the client (BWA) and the client's bank (IDB) immediately (within one hour) following the incident, and report it to the Chief Labor Officer at the Ministry of Labour	Project Manager
4	Police involvement	The Royal Barbados Police Force will conduct an investigation, and the body will be handed over to the coroner for a post-mortem examination to determine the cause of death (as required by Barbadian law)	Police/Forensic Services
5	Notificatio	Immediate family members must be notified in person or by	Project

No.	Step	Specific Action	Responsible Party
	n of next of kin	telephone by a designated representative, ensuring that the information is conveyed accurately, sensitively and respectfully; notification must not be given via text message or email	Manager/Human Resources
6	Arrangements for the Deceased's Remains	In accordance with the family's wishes and Barbadian law, a registered funeral director shall be commissioned to collect and preserve the remains; where cross-border transport is involved, the Ministry of Health's entry regulations must be observed	Family/Funeral Directorate
7	Post-mortem Arrangements	Assistance with procedures such as obtaining a death certificate, processing insurance claims and terminating employment contracts; provision of mental health counseling services where necessary	General Affairs Office / HSE Manager
8	Recording and Archiving	Compile and archive a complete record of the incident, the investigation report and corrective measures for use in accident investigations and continuous improvement	HSE Manager

8.4.13.10. Coordination of Healthcare Resources

Barbados' public health system is centered on the Queen Elizabeth Hospital (554 beds), which provides comprehensive services including A&E, surgery, intensive care, cardiothoracic surgery and neurosurgery, and is the island's largest referral hospital. In addition, there are eight polyclinics across the island providing primary healthcare services. The project must enter into an emergency medical cooperation agreement with this hospital, clearly defining a priority admission pathway for injured persons upon arrival.

8.4.13.10.1. List of Medical Supplies

All medical supplies must be managed by designated medical personnel at the camp. A stock ledger must be maintained, expiry dates checked regularly and supplies replenished in a timely manner to ensure that emergency supplies are available at all times. At the same time, health records must be established for all personnel (including medical examination records, health status and medical history) to facilitate the monitoring and management of injured or ill personnel.

Table 165 presents the list of medical supplies.

Table 165***: Medical Supplies***

No.	Category	Name of Medication/Equipment	Specification	Manufacturer	Quantity
I. Hemostasis, Disinfection and Dressing for Traumatic Injuries					
1	First-aid treatment	75% medical alcohol	100 milliliters (75% ± 5%)	Hubei Aibang Biotechnology Co., Ltd.	10
2	First-aid treatment	Povidone-	100 milliliters	Hunan Kefu Medical	10

No.	Category	Name of Medication/Equipment	Specification	Manufacturer	Quantity
		iodine antiseptic solution		Equipment Co., Ltd.	
3	First-aid treatment	Hydrogen peroxide	3 percent × 100 milliliters	Jiangxi Caoshanhu Disinfectant Products Co., Ltd.	10
4	First-aid treatment	Saline solution	500 milliliters: 4.5 grams	Sichuan Kelun Pharmaceutical Co., Ltd.	10
5	First-aid treatment	Medical plasters (standard/waterproof)	25 plasters (waterproof, elastic)	Hai's Hainuo Health Technology Co., Ltd.	10
6	First-aid treatment	Sterile gauze, medical cotton wool	7 × 7 cm × 8 layers × 5 pieces	Nanchang Chaoyang Medical and Healthcare Supplies Co., Ltd.	20
7	First-aid treatment	Sterile gauze, medical cotton wool	50g	Xuchang Zhende Medical Dressings Co., Ltd.	10
8	First-aid treatment	Elastic bandages, self-adhesive bandages, triangular bandages	8 cm × 6 m × 2 rolls	Nanchang Chaoyang Medical and Healthcare Supplies Co., Ltd.	10
9	First-aid treatment	Elastic bandages, self-adhesive bandages, triangular bandages	Non-woven self-adhesive, 5 cm × 450 cm	Kefu Medical Technology Co., Ltd.	5
10	First-aid treatment	Moist Burn Ointment	10 g × 3 tubes	Shantou Meibao Pharmaceutical Co., Ltd.	3
II. Products for Traumatic Injuries and Muscle Pain Relief					
11	Pain Relief for Traumatic Injuries	Yunnan Baiyao Aerosol (Red + White Bottles)	85 g + 60 g	Yunnan Baiyao Group Co., Ltd.	5
12	Pain Relief for	Safflower Oil,	25 milliliters	Aomei Pharmaceutical (Traditional Chinese	5

No.	Category	Name of Medication/Equipment	Specification	Manufacturer	Quantity
	Traumatic Injuries	Joint-Relief Oil		Medicine) Co., Ltd.	
13	Pain Relief for Traumatic Injuries	Safflower Oil, Joint-Relief Oil	35 milliliters	Ax Mark Authentic Safflower Oil	5
14	Pain Relief for Traumatic Injuries	Anti-swelling and Pain-Relieving Tincture	60 milliliters	Guangxi Zhuang Autonomous Region Huahong Pharmaceutical Group Co., Ltd.	5
III. Specialized Heatstroke Prevention and Cooling Products (Summer Essentials)					
15	Heatstroke Prevention and Cooling	Huoxiang Zhengqi Lotion/Capsules	10 ml × 10 vials	Tai Ji Group Chongqing Fuling Pharmaceutical Factory Co., Ltd.	100
16	Heatstroke Prevention and Cooling	Wind Oil, Cooling Oil	6 milliliters	Guangdong Taienkang Pharmaceutical Factory Co., Ltd. (formerly Shantou	10
17	Heatstroke Prevention and Cooling	Wind Oil, Cooling Oil	15 g	Jiangsu Huasheng Pharmaceutical Co., Ltd.	10
IV. Cold and Fever, Respiratory Anti-inflammatory Products					
18	Cold and fever relief	Ibuprofen Tablets	0.3 g × 14 tablets	Huizhou Daya Pharmaceutical Co., Ltd.	10
19	Cold and fever relief	Paracetamol Tablets	0.65 g × 18 tablets	Shanghai Johnson & Johnson Pharmaceutical Co., Ltd.	10
20	Cold and fever relief	Compound Paracetamol and Phenylephrine Capsules, Cold Relief Granules	20 capsules	Hainan Huluwawa Pharmaceutical Group Co., Ltd.	10
21	Cold and fever relief	Compound Paracetamol and Phenylephrine Capsules, Cold Relief Granules	10 g × 9 sachets	China Resources Sanjiu Pharmaceutical Co., Ltd. (China Resources Sanjiu)	10

No.	Category	Name of Medication/Equipment	Specification	Manufacturer	Quantity
V. Gastrointestinal and Digestive Health, Anti-diarrhea and Stomach-Nourishing Products					
22	Gastrointestinal Medicines	Montmorillonite Powder	3 g × 12 sachets	Jilin Yizheng Pharmaceutical Group Co., Ltd.	10
23	Gastrointestinal Medicines	Norfloxacin Capsules	0.1 g × 48 capsules	Lepu Hengjiuyuan Pharmaceutical Co., Ltd.	10
24	Gastrointestinal Medicines	Omeprazole	20 mg × 21 tablets × 1 bottle	Bengbu Fengyuan Tushan Pharmaceutical Co., Ltd.	10
VI. Skin, anti-allergy and insect bite remedies					
25	Topical Medicines	Erythromycin ointment	18 g	Tangshan Hongxing Pharmaceutical Co., Ltd.	10
26	Topical Medicines	Dermatitis-Ping Ointment	30 g: 22.5 mg	Guangdong China Resources	10
27	Topical Medicines	Zinc oxide lotion	100 milliliters	Jiangsu Huasheng Pharmaceutical Co., Ltd.	10
28	Topical Medicines	Loratadine Tablets	10 mg × 12 tablets	Jiangsu Yabang Epson Pharmaceutical Co., Ltd.	10
VII. Emergency cardiovascular and cerebrovascular reserve category					
29	Emergency reserve	Glyceryl trinitrate	0.5 mg × 100 tablets	Shijiazhuang Huaxin Pharmaceutical Co., Ltd.	2
30	Emergency reserve	Aspirin enteric-coated tablets	100 mg × 24 tablets/strip × 5 strips/box	Jiangsu Wangao Pharmaceutical Co., Ltd.	2
31	Emergency reserve	Glucose	10 g × 12 sachets	Chongqing Heping Pharmaceutical Co., Ltd.	5
VIII. Medical Devices and First Aid Equipment					
32	Medical devices	Electronic/Mercury Thermometers	WG-1108 (Mercury-free internal reference axillary type)	Jiangsu Chenyu Medical Equipment Co., Ltd.	1
33	Medical devices	Electronic/Mercury	KF-HW-009 Grey Non-Voice Model	Kefu Medical Technology Co., Ltd.	1

No.	Category	Name of Medication/Equipment	Specification	Manufacturer	Quantity
		Thermometers			
34	Medical devices	Blood pressure monitors, stethoscopes	YE610E	Jiangsu Yuyue Medical Equipment Co., Ltd.	2
35	Medical devices	Stretcher	YHTJ01	Yihui	2
36	Medical devices	Blood pressure monitors, stethoscopes	Dual-purpose	Jiangsu Yuyue Medical Equipment Co., Ltd.	1
37	Medical devices	Hair clippers	units	Feike Borui	1
38	Medical devices	Semi-automatic external defibrillator (AED)	units	Jiuxin brand	1
IX. Disinfection, Sterilization and Protective Equipment					
39	Disinfection and Protection	84 Disinfectant, Disinfectant Effervescent Tablets	500 g	Jiangxi Caoshanhu Disinfectant Products Co., Ltd.	10
40	Disinfection and Protection	Hand Sanitizer Gel	500 ml, 75%	Wuhan Xuehuan Medical Disinfection Products Co., Ltd.	5
41	Disinfection and Protection	Disinfectant and Protective Equipment	Flat-style ear-loop masks, 17.5 × 9.5 cm, 10 pieces per individual pack	Hunan Kangwo	10
42	Disinfection and Protection	Disinfectant and Protective Equipment	Powder-free/textured – 7.5M size – 2 pieces	Kefu Medical Technology Co., Ltd.	15
X. STI Testing, Contraception and Prevention					
43	Contraception and Prevention		Ultra-thin and smooth, pack of 12	Tianjin Zhongsheng Latex Co., Ltd.	3

No.	Category	Name of Medication/Equipment	Specification	Manufacturer	Quantity
44	Contraception and Prevention		1.5 mg * 1 box	Wuhan Jiulong Renfu Pharmaceutical Co., Ltd.	3
45	Test Kit		1 kit*1 box	Hangzhou Botuo Biotechnology Co., Ltd.	5

8.4.13.11. Construction Site Safety Management

The construction work authorisation and permit process explicitly covers hoisting and lifting operations and work with a risk of immersion or submersion. The responsible HSE Officer shall review the task-specific risk assessment, lifting plan or water-rescue arrangements, competency of personnel, and applicable emergency procedure before authorising the work (HSE Management Manual, Annex J, Sections 7.3, 12.2.1 and 12.2.12).

General Safety Management Procedures

Closed access management shall be implemented at the construction site. All personnel must pass training and assessment, complete registration, and wear identification badges before entering. Strict registration and approval procedures shall be enforced for external personnel and vehicles. The high-risk work permit system shall be strictly enforced. Confined space, hot work, work at heights, lifting and hoisting, temporary electrical, deep excavation and submergence-risk operations must be approved in advance, and construction without permits is strictly prohibited. Anti-"three violations" inspections shall be routinely conducted. Daily pre-shift safety briefings, risk notifications, and sign-off confirmation procedures shall be implemented. All operations shall be fully controllable and traceable.

Daily pre-shift safety briefings must be organized and conducted by the team leader, assisted by the safety officer and supported by the project department’s technical and management staff, to ensure that the briefing content aligns with the day’s actual construction activities. The briefing must cover: the hazards associated with the day’s tasks and their control measures; requirements for the wearing of personal protective equipment; emergency procedures and evacuation routes; and the day’s weather conditions and potential impacts (during hurricane or heavy rain warnings, the thresholds for work suspension must be emphasized). The briefing must be documented in a standardized written record, signed and confirmed individually by the person conducting the briefing and all attendees (all personnel on duty), specifying the time of the briefing, the scope of work, the number of personnel present and key safety requirements; anyone who has not attended the briefing or failed to sign the confirmation form is strictly prohibited from commencing work that day.

Daily Pre-shift Safety and Technical Briefing Record Form for

Construction Sites

Table 166 presents the daily pre-shift safety and technical briefing record form for construction sites.

Table** 166**: Daily pre-shift safety and technical briefing record form for construction sites

Project Name: _____	Weather Conditions: _____

Construction Crew: _____	Team Leader/Briefing Officer: _____

Number of Workers: Expected: ___ / Present: ___ / Absent: ___ (Reason: _____)		Date: ____ year ___ month ___ day		
Category	Details		Execution Confirmation	
I. Check on personnel status	1. All personnel are in good spirits; there are no instances of alcohol consumption, illness or excessive fatigue		☐ Yes ☐ No (___ people have been adjusted)	
	2. All personnel are wearing personal protective equipment (safety helmets, safety harnesses, gloves, etc.) correctly		☐ Yes ☐ No (___ people have been rectified)	
II. Today's Construction Work				
III. Notification of Hazard Sources	☐ Fall from height	☐ Struck by falling objects	☐ Electric shock	☐ Mechanical injury
	☐ Collapse/landslide	☐ Lifting-related injuries	☐ Fire/scalding	☐ Poisoning/Asphyxiation
	Other risks:			
IV. Targeted Prevention and Control Measures	1. Working at height: Fasten safety harnesses correctly (high-point attachment, low-point use); throwing tools up or down is strictly prohibited		☐ Briefing completed	

	2. Temporary electrical installations: Non-electricians are strictly prohibited from connecting wiring; cables must be routed overhead or buried for protection	☐ Briefing completed
	3. Hot work: Obtain a hot work permit; clear flammable materials from the surrounding area; provide fire extinguishers	☐ Briefing completed
	4. Concurrent Work: Establish a cordoned-off area, appoint a dedicated supervisor, and ensure no one stands below	☐ Briefing completed
	5. Other measures: ***	☐ Briefing completed
V. Emergency Reminders	Emergency evacuation routes: ****** Emergency telephone number: ******	☐ Information provided
Signatures of attendees:		

8.4.13.12. Specialized Safety Management for High-Risk Operations

Confined Space Operations (Tanks, Pipelines, Enclosed Excavations)

Strictly adhere to the mandatory principle of 'test first, ventilate next, then commence work, with a designated person supervising throughout'. Prior to work commencing, use professional detection equipment to test the concentrations of oxygen (O2), hydrogen sulfide (H2S), methane (CH4), carbon dioxide (CO_2), carbon monoxide (CO) and Ammonia (NH_3); entry is permitted only once all readings meet the required standards. Mechanical ventilation must be maintained throughout the entire operation, and the supervisor must remain on duty at all times; leaving the post is strictly prohibited. Workers must wear emergency protective equipment such as self-contained breathing apparatus and safety ropes; warning and caution signs must be erected in the work area; and upon completion of the work, personnel and tools must be accounted for one by one to eliminate any residual safety hazards.

Deep Excavation Operations

Excavation work must be carried out strictly in accordance with the specialized plan, proceeding layer by layer; over-excavation and undercutting are strictly prohibited. Guardrails must be installed around the perimeter of the excavation, and measures must be taken to ensure proper drainage and flood prevention on the slopes, while ensuring that safety passages and emergency exits remain unobstructed. Work must be suspended immediately and rectified should any hazards such as cracking, slippage or waterlogging occur; employees are granted the right to refuse dangerous work in accordance with Clause 104 of CAP 356.Formwork, shoring and scaffolding for tanks and structures must be approved by the engineer before use; risks of concrete pour collapse and falling objects from height must be strictly controlled. High-risk civil engineering work in excavation pits and in the open air is prohibited during rainy weather.

Work at Heights and Edge Operations

When working at heights of 2 meters or above, workers must wear a safety harness and a full set of protective equipment; fall protection systems must comply with statutory standards. Work platforms and scaffolding must be inspected and approved by an engineer before being put into use. Protective measures (such as guardrails and covers) must be installed at all edges, openings and access points; throwing objects from height and unauthorized crossing of protective barriers are strictly prohibited. Tools and materials must be stored in designated locations to prevent accidents involving being struck by falling objects or falls from height. A fall prevention plan must be drawn up for work at height to ensure safe access routes.

Hot Work

Hot work operations must be carried out under a specific hot-work permit. Prior to commencing work, all flammable and explosive materials within the operational radius must be cleared; combustible substances must be removed and it must be verified that there is no accumulation of combustible gases. Sufficient fire-fighting equipment, such as fire extinguishers, must be provided. After the hot work has been completed, a person must remain on site to monitor the area for at least 30 minutes; the site may only be vacated once it has been confirmed that there are no smoldering embers or fire hazards. Unauthorized hot work is strictly prohibited in enclosed spaces and areas where flammable gases are concentrated. Hot work permits must be reviewed daily; permits must be revoked immediately if the working environment changes or if incompatible operations are taking place.

Temporary Electrical Operations

The "three-level distribution, two-level protection" standard shall be strictly enforced. Cables shall be laid in an orderly manner, and unauthorized connections strictly prohibited. All electrical equipment shall be reliably earthed and zeroed, with residual current devices that are sensitive and reliable. Trained dedicated electricians shall be responsible for electrical management, conducting daily inspections of cables and equipment, and promptly rectifying aged, damaged, and leaking hazards. Electrical protection in humid work areas shall be strengthened to strictly prevent electric shock accidents.

Lifting and Mechanical Operations

Special equipment must undergo on-site acceptance and be registered before use; operators must undergo training before commencing work, and the operation of faulty equipment is strictly prohibited. A safety perimeter must be established for lifting operations, with a designated person in charge of unified command; the safe working load of lifting slings must be calculated, and unauthorized personnel

are strictly prohibited from entering the operational radius. Mechanical operations must be carried out in strict accordance with regulations; no personnel are permitted within the operational radius to prevent accidents such as mechanical collisions, falling loads during lifting, and strikes by falling objects.

Work Process Safety Management

The construction processes for this project primarily involve earthworks, scaffolding erection, formwork erection and dismantling, steel reinforcement tying, concrete pouring and equipment installation. In accordance with Sections 6 and 7 of the Barbados Safety and Health at Work Act (Cap. 356), employers/occupiers are obliged to ensure the health, safety and welfare of all employees and persons who may be affected by work activities, and to provide safe equipment, work systems and adequate training and supervision. An appropriate and thorough risk assessment must be completed for each work process prior to commencement, and measures must be taken to eliminate or reduce risks. Safety management personnel must implement safety management in accordance with the requirements of this Act and the relevant regulations.

Earthwork Excavation

1. Preliminary Investigation and Planning: Prior to construction, the location of underground utilities and structures must be ascertained. In accordance with Section 7 of the Barbados Safety and Health at Work Act (Cap. 356), the occupier must ensure that every part of their workplace is of safe construction, made of sound materials and properly maintained.

2. Load Management: The stacking of heavy objects within 1 meter of the perimeter of the excavation pit is strictly prohibited to prevent the risk of collapse caused by overloading (in accordance with Section 7 regarding the prohibition of overloading that creates a hazard).

3. Safe Access: Workers operating within the excavation pit must have safe means of access and egress. In accordance with Section 8 of the Barbados Safety and Health at Work Act (Cap. 356), safe means of access and egress must be provided for all workplaces, and such access must be maintained in a safe condition.

4. Drainage and Protection: During construction in the rainy season, drainage ditches and retaining walls must be installed around the excavation pit to prevent rainwater from entering and causing slope instability.

Formwork Operations

1. A specialized construction plan must be prepared for formwork operations. Formwork installation must be carried out in accordance with design requirements, and the support system must be firm and reliable.

2. Formwork removal must be carried out after concrete strength has reached design requirements, following the principle of "last installed, first removed."

3. Exclusion zones shall be established during formwork removal, and unrelated personnel strictly prohibited from entering.

Reinforcement Work

1. Reinforcement processing machinery must be securely installed, with all safety guards in place and in good working order. In accordance with Section 7 of the Barbados Safety and Health at Work Act (Cap. 356), hazardous parts of machinery must be enclosed, covered, fenced off or otherwise effectively protected to prevent hazards;

2. When cutting or bending reinforcing bars, direct contact with the bars by hand is strictly prohibited. Workers must use safety equipment appropriately in accordance with Section 9 of the Barbados Safety and Health at Work Act (Cap. 356) and exercise due care for their own safety and that of others;

3. When handling steel bars, be mindful of the surrounding environment and overhead power lines to prevent collisions and electric shock;

4. When tying steel bars at height, a working platform must be erected; it is strictly prohibited to stand on formwork or supports while working.

Concrete Works

1. When pumping concrete, pipe connections must be secure to prevent pipe bursts that could cause injury.

2. When pouring concrete, a designated person must supervise the formwork and shoring system to promptly identify safety hazards such as deformation.

3. When using vibrators, operators must wear insulated footwear and insulated gloves. In accordance with the 'Personal Protective Equipment Regulations' (2022), the contractor shall provide workers with suitable PPE and ensure it is used correctly.

Equipment Installation

1. A specific construction plan must be drawn up and a risk assessment completed prior to the installation of equipment.

2. During equipment installation, it is strictly prohibited to touch rotating parts by hand; rotating parts of machinery must be effectively guarded in accordance with the requirements of Section 7 of the Barbados 'Safety and Health at Work Act' (Cap. 356).

3. During equipment commissioning, procedures must be strictly adhered to in accordance with operating instructions; a designated person must be assigned to supervise the process, and the commissioning area must be cordoned off and clearly signposted to prevent unauthorized persons from being exposed to danger.

8.4.13.13. Fire Prevention and Security Management

Fire-fighting equipment must be provided in full accordance with standards at the construction site, accommodation areas and materials stores; it must be regularly calibrated and updated to ensure it remains in good working order. Fire escape routes must remain clear at all times; blocking or occupying them is strictly prohibited. Flammable and explosive materials, fuels and chemicals must be stored in separate designated areas, managed by designated personnel and issued in strictly controlled quantities. A 24-hour security duty system must be implemented, as detailed in the 'Security Management Plan'; the entry and exit of personnel and vehicles must be regulated, and measures must

be taken to prevent theft of materials and equipment, thereby ensuring stable order at the construction site.

CRSEG response (November 2026): The evacuation-route and emergency assembly map is reproduced as Figure 79. For emergency management procedures, refer to Section 8.4.13 of this report and to Section 12 of the CRSEG HSE Management Manual in Annex J. The inclusion of these documents does not, by itself, verify completion of site drills or route briefings.

Figure 80 shows the evacuation routes and emergency assembly points.

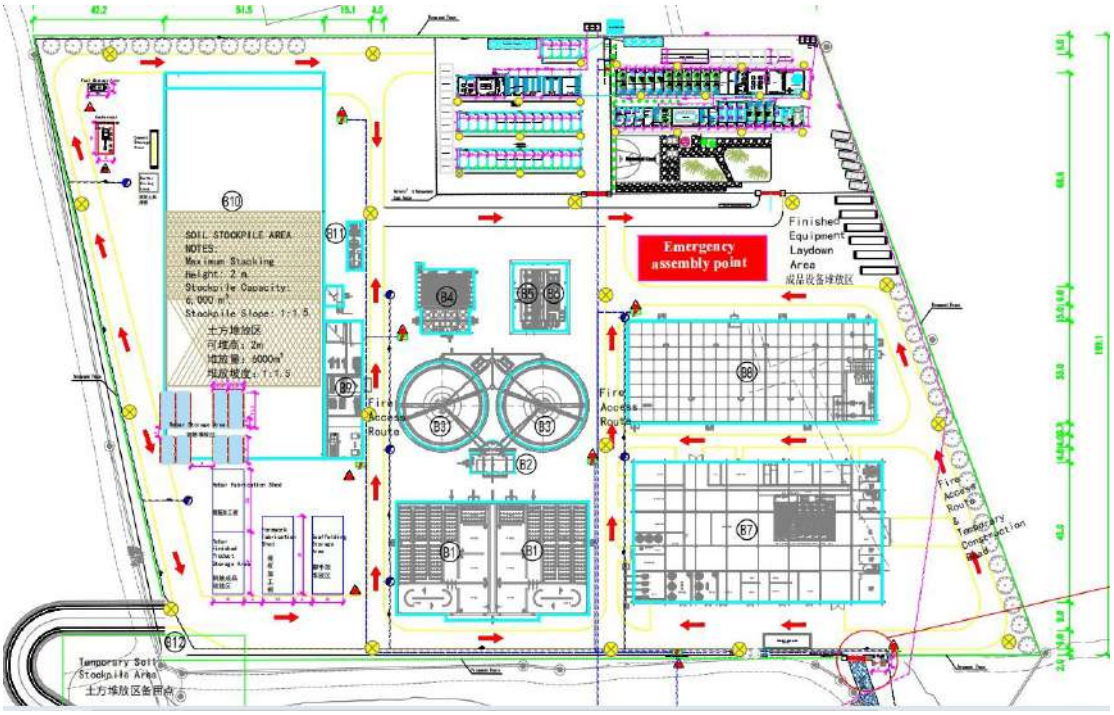


Figure 80**: Evacuation Routes and Emergency Assembly Points**

Environmental Protection Management

In accordance with the ecological protection requirements for the waters off Barbados, strictly implement environmental protection controls throughout the entire construction and operation process, prevent all types of pollution incidents, and protect the local ecological environment in compliance with regulations. Detailed implementation measures are set out in the 'Safety, Health and Environment Management Manual'.

8.4.13.14. Prevention and Control of Water Pollution

1. Construction Wastewater Management: Standing water in excavation pits, construction wash water and slurry shall be collected centrally in settling ponds; after sedimentation, it shall be conveyed via pipework to the existing sewage treatment plant for treatment. The direct discharge of untreated wastewater into surrounding waters, watercourses or soil is strictly prohibited during construction.

2. Material Management: Storage areas for building materials such as cement, sand, gravel, paints and chemicals must be equipped with measures to prevent rainwater ingress and material runoff. In particular, storage areas for chemicals and oils must be fitted with containment berms to prevent the spread of spills. During construction, it is strictly prohibited for oils or slurry to leak into water bodies.

3. Management and Protection of Wetlands and Coastal Zones: The dumping of construction waste, domestic waste and construction debris into surrounding waters is strictly prohibited, as is any unauthorized offshore activity that damages the marine ecosystem. Waste generated during the construction and operational phases must be collected and stored in covered storage facilities at designated on-site locations, to be collected regularly, weekly as standard and twice weekly where required and transported to the Mangrove Landfill at the Sustainable Barbados Recycling Centre.

8.4.13.15. Prevention and Control of Air and Noise Pollution

1. Dust Control: During construction and operation, earthworks, material stockpiles and transport vehicles must be fully covered with dust-control netting (green, 6-needle); the construction site must be regularly watered to suppress dust; transport vehicles must have their wheels washed before leaving the site to prevent mud from being carried onto roads and the spread of dust.

2. Noise Control: During construction and operation, construction sequences shall be planned appropriately to avoid high-noise operations during residents' rest periods; noise-reduction measures shall be implemented for high-noise equipment (1. Monitor ambient background noise levels near equipment closely and keep them within permissible limits. 2. Where necessary, fit enclosures to equipment or erect movable acoustic barriers to minimize the impact of noise.) At the same time, night-time construction should be avoided as far as possible (should night-time construction be required, the client's consent must be obtained) to minimize the impact of construction noise on surrounding residential areas.

8.4.13.16. Integrated Solid Waste Management Plan

Solid waste generated during construction is categorized into three types

(1) Primary Waste Definitions

Barbadian law formally categorizes waste into three primary definitions:

1. Refuse: General, non-liquid waste material.
2. Rubbish: Combustible and non-combustible items (paper, garden waste, tires, etc.).
3. Swill: Organic food waste/rubbish.

(2) Main Waste Categories

1. Municipal Solid Waste (MSW): Typical household and commercial rubbish, including organic waste.
2. Recyclable Waste: Separated materials such as glass, plastic (PET/HDPE), metal and oil.
3. Organic/Green Waste: Biodegradable garden and food waste, managed largely through composting.
4. Construction & Demolition (C&D) Waste: Bulky, non-hazardous rubble, timber and concrete.

Methods for the Management of Solid Waste Generated During Construction

1. Contractors shall comply with the provisions regarding on-site waste disposal set out in the Health Services (Refuse Collection and Disposal) Regulations (1975) and shall monitor waste in accordance

with the Integrated Solid Waste Management Plan. A permit from the Environmental Protection Department is required for the disposal of special waste at Health Services Authority facilities.

2. The first two types of waste should be collected and stored in covered storage facilities at designated on-site locations, so that they can be collected regularly, weekly as standard and twice weekly where required and transported to the Mangrove Landfill at the Sustainable Barbados Recycling Centre;

3. Metal waste may be disposed of at the Bagatelle scrap metal facility.

4. Separate waste containers used for holding hazardous liquids so that they can be collected, stabilized and pre-treated prior to disposal.

5. Under no circumstances is the disposal of solid waste in wetlands or unauthorized dumping sites permitted.

Figure 81 shows the waste collection route map.

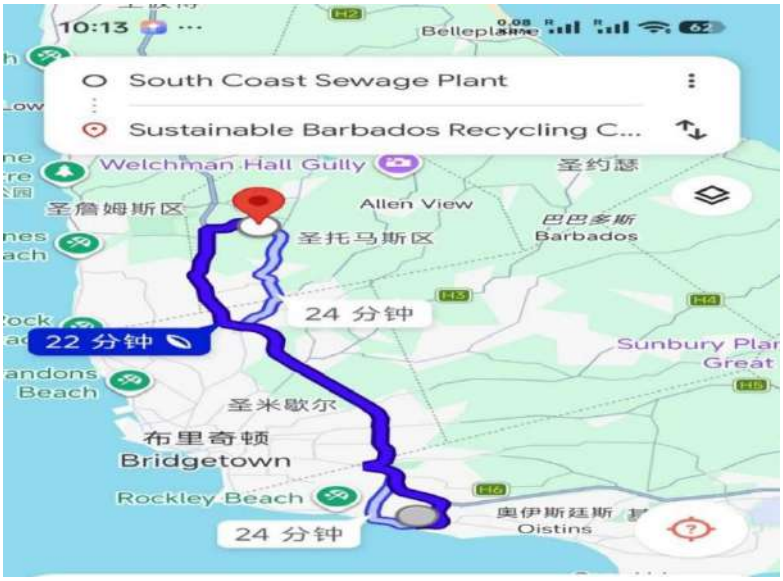


Figure 81**: Waste Collection Route Map**

Hazardous Waste Management

(1) Regulatory and International Convention Framework

1. Key legislation: This includes the Health Services (Nuisances) Regulations, 1969, and the Health Services (Disposal of Offensive Matter) Regulations, 1969, as well as the Pesticides Control Act, among others.

2. International Conventions: Barbados is a Party to the Basel Convention, which governs the transboundary movement and disposal of hazardous waste. As Barbados lacks domestic disposal capacity for hazardous waste, all such waste must be exported for treatment in accordance with this Convention.

(2) Hazardous Waste Management

1. Definition and Classification of Hazardous Waste: According to the EPD's definition, hazardous substances are those possessing properties such as toxicity, reactivity, corrosiveness, flammability,

radioactivity, infectivity or carcinogenicity. Hazardous waste at construction sites may include: waste paint, solvents, waste oil, asbestos-containing materials, waste batteries, fluorescent tubes and chemical containers.

2. Application for Hazardous Waste Disposal: As there is no local disposal capacity, contractors must submit a written application to the Director of the EPD, specifying the types and quantities of hazardous waste requiring disposal and providing a Safety Data Sheet (SDS). The EPD will then provide disposal recommendations and assist in arranging export.

3. Export Procedures: The transboundary movement notification documents stipulated by the Basel Convention must be completed, and prior approval must be obtained from both the importing country and any transit countries.

4. Temporary Storage Requirements: Prior to removal from the site, hazardous waste must be: stored in approved containers and labeled in accordance with an accredited classification system. Incompatible wastes must be strictly segregated. A containment bund must be installed, with the container capacity set at 110 percent of the total volume of the stored material, and the date of filling must be recorded.

(3) Pollution Control and Prevention

1. Leakage and seepage prevention: All hazardous waste storage areas must be fitted with containment bunds.

2. Signage and Management: Storage areas must be clearly signposted to indicate the risks associated with the waste. All waste movements in and out must be recorded, including volume, weight and type.

3. Prohibition of Incineration and Illegal Dumping: The on-site incineration of solid waste is strictly prohibited, as is the disposal of waste at unauthorized dumping sites.

(4) Emergency Response Plan

1. Approval and Drills of Emergency Plans: A written Emergency Response Plan (ERP) must be drawn up on site. The content of the Emergency Response Plan is detailed in the 'Spill Emergency Response Plan (2nd Edition)', and this plan must be practiced at least once every six months.

2. Emergency Supplies: The site must be equipped with spill containment and clean-up equipment (e.g. oil absorbent mats, sand), spill containment vessels and personal protective equipment (PPE).

3. Incident Reporting: Any spill incident must be cleaned up immediately and reported to the supervising engineer and the client as soon as possible.

(5) Division of Responsibilities

Please refer to the 'Integrated Solid Waste Management Plan' section of the project's ESIA and ESMP.

(6) Training and Capacity Building

1. Training Requirements: Personnel at waste management facilities must undergo at least 10 hours of training annually on hazardous waste-related knowledge.

2. Training Content: This must cover the correct use of spill containment measures, the correct donning of PPE, the identification and safe packaging of hazardous waste, and Standard Operating Procedures (SOPs), among other topics.

(7) Monitoring and Reporting

1. Record-keeping system: A designated person on site must be responsible for record-keeping to collect data on waste, including type, volume, weight and characteristics, and to establish material tracking and updated stock records.

2. Monitoring Frequency: Given that waste is typically collected once a week on site, monitoring of waste management should also be carried out weekly to ensure that all measures are being implemented.

3. Regular Reporting: Matters relating to waste management must be reported regularly to the supervising authority.

(8) Improvement Mechanism

Standard Operating Procedures (SOPs): The site must draw up written Standard Operating Procedures (SOPs). The SOPs should include: organizational structure and responsibilities, types of waste received and their hazards, and waste handling operating procedures. For further details, please refer to the 'Integrated Solid Waste Management Plan' section of the project's ESIA and ESMP.

8.4.13.17. Ecological Protection

Strict protection must be afforded to vegetation, wetlands and coastal marine ecosystems in the vicinity of the project; the arbitrary felling of vegetation and the destruction of topography and landforms are strictly prohibited. Upon completion of construction, the site must be cleared and greening restored in a timely manner, and ecological restoration work within the plant premises must be carried out to meet the local ecological and environmental acceptance requirements of Barbados. Detailed implementation actions are set out in Chapter 11, 'Environmental Protection Management', of the 'Health, Safety and Environment Management Manual' and in the 'Environmental and Construction Mitigation Measures Strategy'.

Pre-construction: Baseline Surveys and Preventive Planning

Prior to the commencement of works, a thorough assessment of the site's ecological baseline must be carried out, and a detailed conservation plan must be drawn up.

1. Conduct an ecological baseline survey: Carry out professional surveys and record vegetation types, wetland areas and coastal marine ecosystems within the project's area of influence. This data will serve as the core basis for subsequent monitoring and acceptance inspections.

2. Delineate strict protection boundaries: Based on the survey results, clearly mark on the construction drawings the trees requiring protection, wetland boundaries and sensitive nearshore waters. Install physical fencing or warning signs to prevent construction personnel and machinery from entering these areas by mistake.

3. Develop a 'transplantation and avoidance' plan: Where it is unavoidable that certain vegetation will be affected, a transplantation plan must be drawn up in advance, and suitable reception sites selected.

During Construction: Proactive Control and Real-time Monitoring

The key objective during construction is to minimize ecological impact, particularly by controlling soil erosion and the discharge of pollutants into the sea.

1. Strict protection of vegetation and topography: In addition to protecting retained vegetation with fencing, topsoil within the construction area must be stripped and stored separately for subsequent landscaping. The arbitrary felling or burial of vegetation is strictly prohibited, and the disposal and stockpiling of waste must avoid ecologically sensitive areas.

2. Control of soil erosion and dust: Temporary barriers and drainage ditches shall be installed in earthwork areas to prevent rainwater runoff from carrying sediment into the sea or wetlands.

3. Waste and chemical management: All construction and domestic waste must be collected and transported to designated locations, such as the Mangrove Landfill at the Sustainable Barbados Recycling Centre (SBRC). Containers holding hazardous liquid waste must be stored separately, and measures must be taken to prevent any chemical leaks that could contaminate soil and water bodies, thereby avoiding damage to the wetland ecosystem.

Post-construction: Site Clearance and Ecological Restoration

Upon completion of construction, site restoration must commence immediately, and proactive ecological restoration measures must be implemented to mitigate the temporary impacts caused by the works.

1. Comprehensive clearance of the construction site: Dismantle all temporary facilities, remove hardened and contaminated soil, and transport away all construction waste.

2. Topographical restoration and vegetation rehabilitation: Backfilling and leveling shall be carried out in accordance with the original topography, and native plant species shall be used for vegetation restoration. Experience in Barbados has shown that planting species with well-developed root systems, such as vetiver grass, can effectively stabilize the soil and prevent soil erosion.

8.4.13.18. Hazardous Chemical Management

1. Strict full-process management of site acceptance inspection, storage management, withdrawal registration, standardized use, and waste disposal shall be implemented.

2. All items entering the site must be accompanied by MSDS Safety Data Sheets and safety warning labels.

3. Strict separate storage by category: flammable, explosive, corrosive, toxic, and oxidizing substances shall be stored separately; incompatible chemicals must not be stored together.

4. Safety warning signs and fire and explosion prevention notices shall be posted in storage areas, with designated no-fire zones.

5. Hazardous chemical management records shall be established, with complete records of intake, withdrawal, consumption, return, and disposal.

6. Items shall be stored by hazardous waste classification and entrusted to qualified units for unified collection and disposal.

7. On-site response plans for spills, fires, and poisoning shall be developed, and emergency drills regularly organized. Upon occurrence of a spill, explosion, or personnel poisoning, operations shall be immediately suspended, personnel evacuated, emergency response initiated, and the incident reported.

8.4.13.19. HSE Training and Briefing Management

Pre-Employment Full-Staff Training

All personnel entering the site must undergo three-tier HSE safety education and training to ensure that all staff understand and are familiar with local regulations, project policies, job-specific risks and emergency measures; they may only commence work after passing the post-training assessment. The Barbados Ministry of Labour emphasizes that safety should not be treated as an 'afterthought', but must be integrated into the entire management process from the project planning stage. Training records must retain complete attendance records, examination papers, summary tables of results and video footage; personnel who fail to meet the required standards are strictly prohibited from entering the site to work.

Table 167 presents the three-level pre-employment training schedule for all staff.

Table 167***: Training Schedule – Three-Level Pre-Employment Training for All Staff***

Training Levels	Training Content	Training Duration	Target Audience	Training Frequency	Responsible Department/Person	Is an assessment required?
Project level	Barbados Local HSE Regulations (Project HSE Management System, Overall Project Risks and Control Measures, Emergency Response Procedures and Evacuation Routes, Environmental Protection Requirements, Gender-Based Violence)	4 hours	All site personnel	Conducted centrally prior to each intake of personnel	Health, Safety and Environment Department / Project Manager	**Yes**
At work-team level	Risk identification in work areas, safe operating procedures, correct use of personal protective equipment (PPE), basic first aid, and accident case studies for safety awareness	4 hours	Construction teams divided into groups	Conducted in groups prior to each batch entering the site	Team Leader / Health and Safety Department	**Yes**
Workstation-level	Specific operational risks and preventive measures for this post, operational procedures, key points for safe equipment operation, and division of responsibilities and duties for emergency response	2 hours	Grouped by specific role	To be carried out immediately upon assignment to a post	Team Leader	Yes

8.4.13.19.1. Specialized Training

Specialized HSE training shall be conducted for high-risk operations personnel and special operations personnel, covering confined space operations, hot work, lifting operations, temporary electrical works, emergency rescue, and occupational health protection. Special operations personnel must be trained before commencing work, with valid and compliant credentials, and regular refresher training shall be conducted.

Table 168 presents the specialized training schedule.

Table** 168**: Training Schedule - Specialized Training

Training Category	Training Content	Training Duration	Target Audience	Training Frequency	Responsible Department	Is an assessment required?
Confined Space Work	Identification and classification of confined spaces, gas detection and ventilation requirements, emergency rescue procedures	2 hours	Operators and supervisors involved in confined space work	Before first assignment; once a year	Health and Safety Department	**Yes**
Hot work	Tiered management of hot work operations, clearance of combustible materials from the site, use of fire-fighting equipment, and duties of supervisors	2 hours	Welders, cutters and hot work supervisors	Before first assignment; once a year	Health and Safety Department	**Yes**
Lifting operations	Safety operating procedures for lifting machinery; inspection and selection of lifting gear; cordoning off and marking of the lifting area	2 hours	Crane operators, riggers, signalmen and lifting supervisors	Before first assignment; once a year	Health and Safety Department	**Yes**
Temporary Electrical Installations	Requirements for distribution boards and cable routing; earth leakage protection, earthing and neutral bonding; prevention of electrical fires and emergency response	2 hours	Electricians, electrical operators and on-site management staff	Before first assignment; once a year	Health and Safety Department	**Yes**
Work at height	Use of safety harnesses and fall arresters; erection of scaffolding and working platforms; protection of edges and openings; regulatory requirements for working at height in Barbadoshttps://barbadostoday.bb/2026/05/11/work-at-height-rules-to-be-fast-tracked-amid-safety-concerns/amp/	2 hours	Personnel engaged in work at height and scaffolding erectors	Before first assignment; once a year	Health and Safety Department	**Yes**

Training Category	Training Content	Training Duration	Target Audience	Training Frequency	Responsible Department	Is an assessment required?
Emergency Response and Occupational Health	First aid skills (CPR, hemostasis and bandaging), identification and protection against occupational hazards (dust, noise, chemicals), use and maintenance of PPE	2 hours	All team leaders, HSE representatives and first-aiders	Before first assignment; once a year	On-site doctor and Health, Safety and Environment Department	**Yes**

Daily Briefings and Awareness Education

Daily pre-shift safety briefings shall be consistently maintained. HSE warning education and accident case studies shall be routinely conducted. Safety slogans, warning signs, and HSE notice boards shall be displayed at construction sites to foster an environment where all staff attach importance to HSE. Monthly HSE special training sessions shall be regularly organized to update management requirements and enhance all-staff safety and environmental awareness.

The construction site must display prominent safety slogans and warning signs at entrances and in high-risk areas as required. The content of monthly thematic training sessions should be dynamically adjusted in line with the project's construction progress; for example, topics on slip prevention and electric shock protection should be added during the rainy season, while lifting safety topics should be included during peak periods for steel structure hoisting. All training records (attendance sheets, training materials, video footage) must be archived and retained as supporting documentation for HSE compliance audits.

Hazard Investigation, Inspection, and Performance Management

Hazard Investigation Mechanism

A four-tier hazard investigation mechanism of "daily inspections + specialized inspections + monthly comprehensive inspections + seasonal inspections" shall be established to achieve comprehensive, no-dead-zone hazard management.

1. Daily inspections: Dedicated HSE personnel shall conduct comprehensive daily site inspections, immediately identifying and rectifying minor hazards. Major hazards shall be immediately suspended, reported, and controlled.

2. Specialized inspections: Monthly specialized investigations shall be conducted for high-risk operations, temporary electrical works, fire prevention, environmental protection, and mechanical equipment.

3. Monthly comprehensive inspections: Led by the Project Manager with full staff participation, comprehensively investigating on-site HSE hazards and compiling inspection records.

4. Seasonal inspections: Targeted at the island's high-temperature, heavy rain, and hurricane conditions, seasonal safety and environmental specialized inspections shall be conducted to implement flood prevention, hurricane prevention, and heatstroke prevention measures.

Table 169 presents the hazard identification and rectification schedule.

Table 169***: Hazard Identification and Rectification Schedule***

Inspection Level	Frequency	Lead Person	Participants	Main Scope
Routine inspections	Daily	HSE Manager	On-duty HSE staff	Comprehensive inspection of the construction site to identify

Inspection Level	Frequency	Lead Person	Participants	Main Scope
				and resolve issues immediately
Specialized Inspections	Monthly (rotating by discipline)	HSE Manager	Specialist technicians and team leaders	High-risk operations, temporary electrical installations, fire safety, environmental protection, machinery and equipment
Monthly comprehensive inspection	Once a month	Project Manager	Full participation (heads of all disciplines, team leaders, HSE team)	Comprehensive on-site HSE hazard identification, with a record kept
Seasonal inspections	Before the change of season or extreme weather	HSE Manager	Emergency Response Team, Heads of each discipline	Specialized inspections for flood prevention, hurricane preparedness and heatwave mitigation

Hazard Closure Management

All identified hazards shall be subject to closed-loop management of "registration, issuance of rectification notices, time-limited rectification, re-inspection, and sign-off," with clearly designated responsible persons, rectification deadlines, and rectification measures. Minor hazards shall be rectified on the same day, general hazards within 3 days, and major hazards immediately suspended for rectification. Resumption of work without sign-off is prohibited. Hazard records shall be maintained, with regular statistical analysis to prevent recurrence of the same type of hazard.

Safety and Quality Inspection and Rectification Record Reference No.: ******

Table 170 presents the safety and quality inspection and rectification record.

Table** 170**: Safety and quality inspection and rectification record

Project Name	South Coast Water Reclamation and Re-use Facilities
Item **Project Overview** **Overview**	The Barbados South Coast Wastewater Reclamation and Re-use Facilities project is situated adjacent to the existing Graham Hall Wetlands in the City of Christ Church, Barbados, to the east of the H7 motorway. Project scope: construction of a new wastewater treatment plant with a secondary treatment capacity of 0.90 ten thousand tons per day during the dry season and 2.40 ten thousand tons per day during the wet season, and a tertiary treatment capacity of 1.80 ten thousand tons per day. The Advanced Water Treatment (AWT) process produces 0.51 ten thousand tons per day of reverse osmosis permeate; The main scope of works includes: all civil engineering and equipment installation; demolition of existing buildings and structures on the construction site; civil engineering, fit-out, procurement, installation and commissioning of equipment for permanent plant buildings and structures; as well as other ancillary works such as roads, landscaping and slope stabilization.

Project Name	South Coast Water Reclamation and Re-use Facilities
Inspection Unit	China Railway Group Barbados Sewage Treatment Plant Project Management Department
Rectification Status Summary	The project department's rectification verifier carried out the verification on schedule; the identified issues have been fully rectified. The specific details are as follows:
Rectification Rectification Status Status Details Details Record Record	**Issue 1**: ******; **Remedial Action**: ******. **Issue 2:** ******; **Remedial action taken:** ******. **The above safety hazards were rectified at **:** on ** ** ****, and have been verified and closed out by the project's Health, Safety and Environment Department.**
Person responsible	Signature: Year Month Day
Head of Department and Verifier	Signature: Year Month Day

Note: This form is produced in triplicate, with one copy each for the rectifying unit, the re-inspection unit and the inspecting unit; the verified copy is retained.

8.4.13.20. HSE Performance Rewards and Penalties

A project HSE performance assessment system shall be established, incorporating HSE accountability into assessments of work teams, individuals, and subcontractors. Teams and individuals who strictly implement HSE systems with no hazards and no violations shall be commended and rewarded. Personnel who violate regulations, fail to adequately rectify hazards, or violate environmental protection and safety regulations shall be penalized; those with serious violations shall be expelled from the site and held accountable.

Content of Performance Assessment

The project's HSE performance assessment is conducted across two dimensions: the process of fulfilling duties and outcome indicators, covering both individuals and subcontractors. Barbados' Safety and Health at Work Act (SHAW Act) sets out the fundamental obligations of employers and employees

under common law: employers must provide a safe workplace, safe work systems, safe tools, safe colleagues and adequate supervision and training; employees must not endanger themselves or others, must use safety equipment and must cooperate with inspections by plant safety officers. The assessment criteria are closely linked to these statutory duties.

Table 171 presents the assessment criteria.

Table* 171*: Assessment Criteria

Assessment Targets	**Assessment Dimensions**	**Specific Assessment Content**	**Assessment Cycle**
Individual	Wearing of PPE	Rate of correct wearing of personal protective equipment (PPE), such as safety helmets, safety harnesses and safety footwear	Daily/Weekly
	Operating Procedures	Whether work is carried out in accordance with the safety operating procedures for the role, and whether any breaches of regulations have occurred	Daily
	Training participation	Participation rates in three-tier training, attendance rates at monthly specialized training sessions, assessment results	Quarterly
	Hidden hazard reports	Quantity and quality of potential hazards proactively identified and reported	Monthly
Subcontractors	HSE System	Whether an HSE management structure has been established and whether dedicated HSE personnel have been appointed	On-site assessment + quarterly
	Implementation of Policies	Compliance with HSE clauses stipulated in the contract; speed and effectiveness of responses to rectification instructions	Monthly
	Accident/breach rates	Incident and non-compliance rates within the subcontracted scope	Quarterly/Annual

Incentive Measures

Subcontractors who strictly implement HSE systems and have no hidden hazards or breaches of regulations shall be commended and rewarded. The Barbados Ministry of Labour emphasizes that

employers should 'proactively implement' workplace health and safety requirements, rather than merely to avoid penalties. Specific incentive measures include:

Subcontractors ranked first in the annual HSE assessment will be awarded extra marks in the tender evaluation or given priority for contract award in the following year's tender process.

Subcontractors with excellent HSE performance may receive an 'Excellent' rating in their contract performance evaluation, thereby enhancing their reputation within the industry.

Specific Penalty Measures

Penalties shall be imposed on personnel for unauthorized operations, failure to adequately rectify potential hazards, and breaches of environmental protection and safety regulations.

Table 172 presents the penalty measures.

Table 172***: Penalty Measures***

Level of Breach	**Typical Circumstances**	**Penalty Measures**	**Legal Basis**
Minor Breaches	Failure to wear PPE correctly, absence from pre-shift briefings, failure to clear the work area in a timely manner	**Written warning**	Provisions regarding employees' obligations under the General Act
Serious Breaches	Unlicensed hot work or temporary electrical installations; unauthorized removal of safety barriers; failure to rectify identified hazards within the specified timeframe	**Work suspension pending completion of specialized HSE training** (unpaid; work may only resume upon passing the training assessment); joint deduction of the team's monthly safety performance points	General Duty Provisions under the Barbados SHAW Act
Serious Breaches	Issuing unlawful instructions, forcing workers to undertake hazardous operations, refusing to rectify major safety hazards, or causing a minor accident	**Immediate removal from the site**; inclusion on the project blacklist; accountability and disciplinary action by project management	Barbados SHAW Act – Employer Liability Provisions; Common Law Employer Safety Obligations
Particularly Serious Breaches	Concealment or misreporting of accidents; breaching ecological protection red lines; causing a major work safety accident or environmental pollution	**Immediate removal from the site and inclusion on the industry blacklist**; **termination of contract/dismissal**; **referral to the judicial authorities** (where a breach of the law has occurred); **demotion or dismissal of** the	Penal provisions under Chapter 347 of the Barbados Factories Act; provisions on employers' criminal liability

Level of Breach	Typical Circumstances	Penalty Measures	Legal Basis
	incident	manager responsible for project management	under the SHAW Act

Procedure for the Enforcement of Penalties:

1. Determination of non-compliance: Non-compliance identified during site inspections or specialized checks shall be documented by the HSE Officer through photography, recording and evidence collection.

2. Notification procedure: Within 24 hours of the violation being confirmed, a written 'Notice of Penalty for Breach' shall be issued to the party concerned and their respective work team or subcontractor, specifying the facts of the breach, the basis for the penalty and the penalty measures.

3. Appeal Procedure: The party concerned may lodge a written appeal with the Project HSE Committee within three working days of receiving the notice.

4. Enforcement and Archiving: The penalty decision shall be enforced following review by the HSE Committee; all penalty records shall be incorporated into the HSE files of the individual, work team or subcontractor.

8.4.13.21. Emergency Management

Emergency Organizational System

A Project Emergency Rescue Leading Group shall be established with clearly designated roles for the Commander-in-Chief, On-Site Rescue Team, Medical and First Aid Team, Logistics Support Team, Communications Team, and Environmental Response Team, with clearly defined responsibilities. Liaison with local hospitals, fire departments, and environmental emergency agencies shall be maintained, establishing a coordinated emergency response mechanism.

Table 173 presents the emergency leading group contact directory.

Table* 173*: Emergency Leading Group Contact Directory

Position	Name	Phone
Project Manager	Wu Rongsen	+1(246)8503666
Construction Technical Director	Wang Peng	+1(246)2568666
Procurement Manager	Li Jianlong	+1(246)8513999
Mechanical Engineer	Ren Mingzhou	+1(246)8511096
Administration Officer	Wu Pengbo	+1(246)8518686

Position	Name	Phone
HSE Officer	Wu Dequan	+1 (246) 850-2192
Interpreter	Yan Lisa	+1(246)8260392
Project Coordinator, PEU,BWA	Mr. Ian Constantine	+1(305)5376796
Project Engineer, PEU, BWA	Mr. David Drakes	+1(868)7389280

Table 174 presents the emergency agency contact numbers.

Table** 174**: Emergency Agency Contact Numbers

Agency	Phone
Queen Elizabeth Hospital	+1(246)536-4500
Police	211
Fire	311
Medical Services	511
Hastings Police Station	+1(246)430-7614

8.4.13.21.1. Specialized Emergency Response Plans

In line with the project's risk profile, comprehensive specialized emergency response plans shall be developed covering: fall from height accidents, excavation collapse accidents, electric shock accidents, confined space poisoning and asphyxiation accidents, fire and explosion accidents, mechanical injury accidents, sudden water pollution incidents, heatstroke, and heavy rain natural disasters. Each plan shall define emergency response procedures, rescue measures, reporting procedures, and post-incident requirements.

Emergency Supplies and Equipment

Emergency supplies shall be allocated at fixed locations at construction sites and living areas, including first aid kits, stretchers, emergency medicines, air breathing apparatus, ventilation equipment, fire extinguishers, fire hoses, emergency lighting, flood prevention supplies, and warning and exclusion equipment. Dedicated personnel shall regularly inspect, update, and replenish emergency supplies to ensure they are functional in an emergency.

The medical and first-aid supplies held at the camp and the sites are those listed in Section 8.4.13.10.1 (Table 165), which is not repeated here.

Table 175 presents the list of emergency rescue equipment and tools.

Table** 175**: List of Emergency Rescue Equipment and Tools

No.	Category	Equipment/Tool Name	Quantity
1	Communications and Early Warning	Walkie-talkies	10
2	Communications and Early Warning	Public address loudspeakers	2
3	Lighting and Evacuation	Emergency lighting	10
4	Lighting and Evacuation	Torches	10
5	Lighting and Evacuation	Evacuation signs	20
6	Lighting and Evacuation	Escape masks (smoke-proof)	10
7	Fire Extinguishing	Dry powder fire extinguishers	50
8	Fire Extinguishing	Fire buckets	10
9	Fire Extinguishing	Fire axe	3
10	Fire Extinguishing	Shovels	5
11	Demolition and Shoring	Crowbars	2
12	Demolition and Shoring	Saws	2
13	Demolition and Shoring	Steel pipes	10
14	Flood Prevention and Drainage	Water Pumps	2 units
15	Flood Prevention and Drainage	Woven sacks	100
16	Flood Prevention and Drainage	Water hoses (for use with water pumps)	50 meters
17	Flood Prevention and Drainage	Wellington boots	20 pairs
18	Flood Prevention and Drainage	Raincoats	20 sets
19	Emergency power supply	Generator	1 unit
20	Vehicles	Emergency vehicles	2 units
21	Chemical protection equipment	Disposable protective suits	3 sets
22	Chemical protection equipment	Chemical-resistant gloves	6 pairs

Emergency Drills and Response

Small-scale emergency drills shall be conducted quarterly, and comprehensive emergency drills annually, focusing on confined space rescue, firefighting, electric shock first aid, and water pollution response scenarios. After each drill, timely review and summary shall be conducted to optimize emergency plans and response procedures. When a sudden accident or incident occurs, the corresponding plan shall be immediately activated to rapidly carry out rescue, loss mitigation, reporting, and post-incident work, preventing escalation of the accident, and strictly complying with local accident reporting procedures. For specific drill plans, please refer to the Emergency Preparedness and Spill Response Plan (Section 8.4.3) and to Chapter 12, Emergency Response Management, of the Contractor's HSE Management Manual (Annex J).

8.4.13.22. Protection of Female Workers

Core Management Principles

1. Equal Treatment and Compliance Principle: Local anti-discrimination regulations shall be strictly enforced to ensure female employees enjoy equal rights in recruitment, employment, remuneration, promotion, training, and leave, eliminating any gender-differentiated treatment.

2. Safety First Principle: Given the high-risk nature of construction sites and the special island environment, targeted strengthening of personal safety, operational safety, and nighttime safety management for female workers shall be implemented.

3. Health-Specific Principle: Individual health needs, including during pregnancy, maternity and lactation, and any legitimate medical restriction, shall be met through individual risk assessment, reasonable accommodation and the applicable OHS measures under the Safety and Health at Work Act. Menstruation is not a basis for any work restriction.

4. Zero Tolerance Principle: Zero tolerance shall be applied to workplace sexual harassment, verbal insults, infringement of rights, and non-compliant employment practices. Any discovered violation shall be seriously investigated and subjected to closed-loop resolution.

8.4.13.22.1. Dedicated On-Site Safety Protection for Female Workers

Task Assignment and Individual Risk Assessment

Task assignment is based on individual occupational risk assessment, competence and certification, legitimate medical restrictions and properly fitting PPE, applied equally to women and men. No position is closed to women by category. High-risk operations such as deep excavation, confined space entry, work at height, heavy lifting, exposure to toxic gases and night-time high-risk construction are controlled for every worker through permits to work, competence requirements, gas detection, supervision and rest and rotation systems (Sections 8.4.13.5 and 8.4.13.11). Where the risk assessment of a pregnant or breastfeeding worker, or of any worker with a medical restriction, identifies a specific hazard, her or his duties are adjusted with her or his consent and without loss of pay, grade or opportunity.

Daily Operational Safety Protection

Dedicated, properly fitting, and compliant labor protection equipment shall be provided for female employees, including properly fitting safety helmets, dust masks, protective gloves, protective clothing, and non-slip footwear, eliminating protection failures caused by use of oversized standard-issue

protective equipment. During operations, HSE personnel shall focus their inspections on female work positions, promptly correcting non-compliant operations, investigating job safety hazards, and ensuring full safety and controllability throughout operations.

Nighttime and Off-Site Safety Management

Night work is assigned on the same basis for women and men. Lone night work is avoided for all workers; where night work is operationally necessary, workers work in pairs under supervision, with full lighting and camera coverage of the work area, and safe transport is provided between the site and the camp or the worker's home. Women's specific security concerns, including travel after dark, are addressed through these arrangements and through the confidential GRM channel rather than by excluding women from night shifts.

8.4.13.23. Anti-Sexual Harassment and Civilized Employment Management

Zero Tolerance Management Standards

The project implements a zero-tolerance policy for workplace sexual harassment and gender bullying. All personnel (including management, operational workers, subcontractor personnel, and external visitors) are strictly prohibited from engaging in any infringement of female employees' rights, including verbal teasing, physical harassment, malicious ridicule, gender bullying, covert photography, stalking, and information harassment. Spreading vulgar information and behavior that insults the dignity and personality of women are strictly prohibited.

Prevention and Supervision Mechanisms

Full camera coverage shall be installed in public areas of construction sites, living areas, and office areas to eliminate private blind spots. Personnel conduct shall be regulated, and civilized construction and employment education routinely conducted. Anonymous complaint channels and female liaison officers shall be established. Complaint methods shall be publicly disclosed, and female rights protection requests handled with full confidentiality, eliminating complaint leaks and retaliatory behavior. All complaints shall be registered, investigated by dedicated personnel, resolved within prescribed time limits, and subjected to closed-loop rectification.

Violation Handling Mechanisms

Upon confirmed instances of harassment, discrimination, or bullying of female employees, work shall be immediately suspended for investigation. Depending on the severity of the violation, measures including public criticism, financial penalties, and expulsion from the site shall be applied. In cases of serious violations that contravene local regulations, the matter shall be referred to Barbados' Labour Department and judicial authorities for handling, with all evidence retained throughout and accountability pursued in accordance with the law.

Dedicated Living Area Safety Management

Accommodation Privacy and Safety Protection

Male and female workers shall be accommodated in separate areas. Female dormitories shall be independently enclosed, with dedicated access control, anti-theft facilities, and lighting equipment installed. Persons of opposite sex randomly entering female living areas and dormitories are strictly prohibited. Female dormitories shall have dedicated management personnel on duty, with regular

inspections of accommodation safety hazards to ensure accommodation privacy, personal safety, and property security. Unauthorized dormitory changing and accommodation of external visitors are strictly prohibited, and personnel flow in living areas shall be standardized.

Dedicated Living Facilities

Independent female-only washing areas, toilets, and shower areas shall be provided, ensuring cleanliness, privacy, safety, and ventilation. Regular cleaning and disinfection shall be carried out to prevent dirty and unsanitary conditions and mosquito breeding. Living areas shall be equipped with emergency hygiene supplies, common medicines, and drinking water to comprehensively meet female employees' daily living needs. Strict 24-hour security patrols of living areas shall be enforced, with a focus on strengthening nighttime living area security management.

Civilized Living Management

All employees' conduct shall be regulated, and gender discriminatory remarks, vulgar jokes, and malicious ridicule in living areas and work areas are strictly prohibited. An environment of respect for women, equality, friendliness, civilization, and harmony shall be fostered on site, and all uncivilized, infringing, and bullying behaviors eliminated.

Training, Education, and Grievance Management

Specialized Training and Education

All incoming personnel must participate in specialized training on female rights protection, covering Barbados female employment regulations, anti-discrimination ordinances, workplace conduct standards, sexual harassment prevention, female operational safety guidelines, pregnancy, maternity and lactation protection policies, and rights protection channels. Bilingual education shall be used for Chinese and foreign employees to ensure that all staff understand, are aware of, and comply with the requirements. Post-training assessments shall be filed, and personnel who fail shall not be permitted to commence work. Regular warning education shall be conducted using case studies to reinforce all-staff compliance awareness.

Routine Awareness Education

Female rights protection, anti-harassment, and civilized employment promotional slogans and notice boards shall be posted at construction sites and living areas to routinely disseminate protection knowledge and compliance requirements. Female protection briefings shall be incorporated into weekly pre-shift meetings to eliminate discrimination, harassment, and non-compliant employment practices, and continuously foster an equal, safe, and civilized construction environment.

Closed-Loop Grievance and Rights Protection Mechanism

A rights protection mechanism of "grievance collection – registration and investigation – rapid resolution – feedback and follow-up – archiving and closure" shall be established. Female employees may at any time report work difficulties, rights infringements, safety hazards, and harassment issues through dedicated liaison officers, anonymous channels, and the project management office. The project shall respond within 24 hours of receiving a grievance and resolve it within the timeframes of the Grievance Redress Mechanism (Section 8.4.12). All matters shall be handled with full confidentiality and

impartiality, and delays, cover-ups, and retaliatory behavior are strictly prohibited, ensuring that every grievance is followed up and every matter receives a response.

Subcontractor HSE Management

Before subcontractors enter the site, HSE qualification reviews shall be conducted to verify safety qualifications, past HSE performance, and personnel certification status. HSE special agreements shall be signed, clearly defining subcontractor HSE responsibilities. All subcontractor personnel shall be incorporated into the project's unified HSE management, with unified training, briefings, inspections, and assessments. Subcontractors with HSE violations or inadequate performance shall be required to rectify within a specified period; those with serious violations shall have cooperation terminated. All subcontractor personnel must complete a pre-employment medical examination and the CRSEG occupational safety and health course.

Access Management (Pre-Entry Controls)

1. Qualification review for access: All subcontractors must submit business licenses, work safety qualifications, HSE management systems, past construction performance, and safety reputation certificates before entering the site. Subcontractors with incomplete qualifications, poor reputation, or multiple violations are strictly prohibited from entering the site. Comprehensive accident insurance must be taken out.

2. Personnel qualification review: Subcontractor special operations personnel and machinery operators must receive training before commencing work. Valid personnel certification documents must be submitted to SCWRP-PEU.

3. Equipment and material inspection submission: Subcontractor machinery, equipment, tools, and protective equipment entering the site must be submitted for inspection. Only equipment that is qualified, with complete protection and in good condition, may be put into use. Unqualified equipment is strictly prohibited from entering the site for operations. Specifications and manuals for large machinery and equipment must be submitted.

4. Contract HSE terms and conditions: Subcontract agreements shall clearly define HSE responsibilities, safety terms, penalty standards, and accident accountability mechanisms, implementing the management principle of "whoever subcontracts is responsible, whoever constructs is responsible."

On-Site Orientation and Briefing Management

1. Three-tier safety training: All subcontractor personnel must complete project-, team- and post-level safety training; they may only commence work after passing the assessment. Training records must be archived and retained; personnel who have not undergone training are prohibited from carrying out work.

2. Specialized Safety Briefings: Specialized HSE technical briefings shall be conducted for high-risk operations such as work at height, lifting and hoisting, hot work, temporary electrical installations, excavation pits, machinery operation, temporary water supply operations and risks of submersion, clearly outlining risk points, prevention and control measures, and operational prohibitions.

3. Localized Training in Barbados: The SCWRP project in Barbados must provide subcontractors with specialized training on local environmental regulations, safety standards, marine conservation,

hurricane and heavy rain preparedness, and the management of water, soil and oil contamination to ensure compliance during construction.

4. Routine pre-shift briefings: Subcontractor work teams shall hold pre-shift meetings daily to communicate the day's operational risks, protective requirements, and emergency precautions, achieving daily risk elimination and pre-emptive hazard awareness.

8.4.13.24. On-Site HSE Management

1. Work Permit Management: For high-risk subcontractor operations, the permit system must be strictly enforced for hot work, work at height, lifting and hoisting, confined spaces, temporary electrical work, and operations involving a risk of submersion. Any work carried out without a valid permit shall be suspended immediately for rectification, and those responsible shall be held strictly accountable.

2. Personnel Behavior Control: Strictly control unsafe behaviors by subcontractor personnel, such as operating in breach of regulations, failing to wear personal protective equipment, reckless construction practices, working under the influence of alcohol, and unauthorized use of electricity; work must be halted immediately upon detection of any violations for rectification. The table below sets out the minimum red-line standards for the safe behavior of subcontractor personnel on the project site. All subcontractors must sign to confirm their compliance with these standards before entering the site. Any breach of the behavioral control regulations will result in immediate suspension of work, fines or even expulsion from the site; any resulting delays to the construction schedule and losses shall be borne by the subcontractor.

Table 176 presents the safety, health and environmental management measures for subcontractors.

Table** 176**: Safety, Health and Environmental Management Measures for Subcontractors

No.	Behavior Control Category	Specific Examples of Non-compliance	Penalty Measures
1	Personal Protective Equipment (PPE)	Entering the site without wearing a safety helmet or fastening the chin strap; working at height without wearing a safety harness (or using a safety harness that is attached too low for the height of the work); failing to wear a high-visibility vest; failing to wear specialized goggles or a face shield during welding or cutting operations.	Work shall be suspended immediately; the offending personnel shall be removed from the site and issued with a warning. Should the same subcontractor commit three such breaches, all their work on the project shall be suspended and all staff shall undergo refresher safety training.
2	Operational Breaches	Operating heavy machinery (such as excavators or tower cranes) without authorization; carrying out specialized operations such as electric welding or electrical work without a valid license; maintaining equipment without following the 'Lockout/Tagout' (LOTO) procedure; using hands instead of tools (e.g. using fingers to test whether gears	Work shall be halted immediately, and a comprehensive investigation and rectification shall be carried out for the work team involved.

No.	Behavior Control Category	Specific Examples of Non-compliance	Penalty Measures
		are turning) or throwing tools or materials.	
3	Working Under the Influence of Alcohol and Electrical Safety Breaches	Consumption of alcohol or evidence of alcohol influence during working hours or on the premises; unauthorized wiring by non-certified electricians, the use of damaged cables, or failure to install residual current devices (RCDs).	Work must cease immediately; the personnel involved must be dismissed immediately and permanently barred from re-entering the project site.
4	Careless Construction and Environmental Protection	Damage or dust caused by rough handling of materials during loading and unloading; haphazard excavation resulting in damage to underground utility lines (water, electricity, fiber-optic cables); indiscriminate dumping of waste or discharge of sewage on site.	Work shall be suspended immediately; the parties concerned shall be ordered to restore the site to its original condition and bear all restoration costs.
5	Discipline and Civilized Construction Practices	Fighting, brawling, theft or willful damage to equipment on the construction site; smoking in non-designated smoking areas (particularly in flammable or explosive zones); unauthorized removal, misappropriation or obstruction of safety barriers (such as guardrails and warning signs).	Work shall be suspended immediately; the individuals involved shall be dismissed, and, depending on the severity of the offense, the matter shall be referred to the local police for handling (particularly in cases of theft).

3. Civilized construction management: Subcontractor work areas shall be cleaned upon task completion. Material storage shall be standardized, passageways kept clear, and drainage maintained. Dust, noise, wastewater, and oil pollution shall be strictly controlled, and environmental protection requirements implemented.

4. Machinery and electrical management: Subcontractor machinery shall be operated by designated persons on dedicated equipment, with regular maintenance. Temporary electrical works shall strictly follow three-level distribution and two-level protection, eliminating unauthorized connections, defective operation, and overloaded operations.

5. Dedicated on-site supervision: During high-risk operations, the subcontractor's safety officer must conduct patrols and supervision to prevent unsupervised work or workers leaving their posts. Reports on supervision, monitoring and post-operation activities must be submitted.

Hazard Investigation and Rectification Management

1. Daily self-inspection: Subcontractor units shall conduct daily on-site self-inspections, investigating safety, environmental, equipment, and fire prevention hazards, and self-rectifying and self-closing issues.

2. Joint project inspections: The project management office shall conduct daily and weekly specialized HSE inspections of subcontractors, establishing records of violations and hazards, with clearly designated responsible persons and rectification deadlines. Inspection records and reports must be retained.

3. Closed-loop hazard management: All hazards shall be subject to closed-loop management of "discovery – rectification – re-inspection – sign-off." Those who refuse to rectify or fail to adequately rectify shall be immediately suspended, interviewed, and penalized.

4. Key risk management: Key management shall be applied to subcontractor high-risk operations, temporary facilities, fuel and chemical storage, wastewater discharge, and near-coastal construction, strictly preventing safety and environmental incidents. Inspection records and reports must be retained.

Emergency and Incident Management

1. Inclusion in the project emergency response system: All subcontractor personnel are to be included in the project's emergency response plan and are required to participate in standardized emergency training and drills, ensuring they are fully familiar with the procedures for dealing with fires, heatstroke, collapses, machinery-related injuries, extreme weather and routine meteorological events.

2. Incident reporting and handling: Any near-miss, minor injury, serious injury, or environmental incident involving subcontractors must be immediately reported to the project management office. Concealment, false reporting, and delayed reporting are strictly prohibited. If self-resolution is ineffective, the project emergency rescue system shall be immediately activated. Detailed emergency response procedures are set out in Section 8.4.13.21.

3. Incident accountability and rectification: Safety and environmental incidents caused by subcontractors shall be the full responsibility of the subcontractor. Rectification, review, and education shall be implemented to prevent recurrence of the same type of issue. Records of all training sessions must be kept on file.

Environmental and Occupational Health Management

1. Occupational Health Protection: Subcontractors shall ensure that all workers wear the full complement of personal protective equipment (PPE) against dust, noise and cuts, as required by their job roles, and shall conduct regular occupational health examinations to eliminate the risk of occupational diseases. Subcontractors must adhere to the main contractor's operational guidelines.

2. Implementation of Pollution Prevention and Control: During subcontracted works, strict control measures must be implemented for dust, noise, waste water, oil contamination and construction waste. Arbitrary discharge is prohibited, as is the pollution of wetlands, coastal marine areas and waters, and any actions that alter the biodiversity of ecosystems. Subcontractors must adhere to the main contractor's policy.

3. Proper Disposal of Waste: Construction waste, domestic waste, waste oil and oil-contaminated waste must be sorted, collected, stored at designated locations and disposed of centrally; unauthorized dumping is strictly prohibited. Subcontractors must adhere to the main contractor's policy.

Performance Evaluation and Reward/Disciplinary Management

1. Monthly HSE assessment: The project management office shall conduct monthly comprehensive HSE assessments of subcontractors, covering safety, environmental protection, civilized construction, hazard rectification, and violations. Assessment results shall be linked to project payments.

2. Reward mechanism: Outstanding subcontractors with standardized HSE management, no violations, no hazards, and no accidents shall be publicly commended and rewarded.

3. Penalties and expulsion: Subcontractors with repeated violations, refusal to rectify hazards, management disorder, or accidents shall be subject to work suspension, fines, interviews, and time-limited rectification. In serious cases, they shall be directly expelled from the site and blacklisted. For details regarding the specific monthly assessment, reward mechanism, and penalty and dismissal measures, please refer to Chapter 10, '10.3 HSE Assessment, Rewards and Penalties', of this plan.

Site Withdrawal Management

1. Completion HSE acceptance: Before subcontractors withdraw upon project completion, a specialized HSE acceptance inspection shall be conducted to investigate residual hazards, equipment, waste, and pollution issues. Withdrawal may only proceed after all issues have been rectified to a satisfactory standard.

2. Safety and Occupational Health (Safety) Compliance Standards

(1) Elimination of Safety Hazards

Edge and Opening Protection: All pits, manhole openings and exposed edges left by construction work have been restored or fitted with permanent safety protection measures (such as guardrails and cover plates) to ensure there is no risk of personnel falling.

Dismantling of Scaffolding and Temporary Facilities: All temporary scaffolding and work platforms have been safely dismantled and cleared from the site in accordance with prescribed procedures; no structural components or loose materials remain.

Residual Risks from Work at Height: There are no unsecured loose materials, tools or other items that could fall and cause injury.

(2) Safety Status of Special Equipment and Machinery

Clearance of Equipment: All construction machinery, vehicles and lifting equipment have been removed from the site, or, where handed over, have been confirmed to be safely shut down, de-energized and locked out and tagged (LOTO).

Isolation of Hazardous Energy Sources: Temporary electrical circuits, gas cylinders, hydraulic lines and similar items have been disconnected, depressurized and safely removed; no live or pressurized equipment remains on site.

3. Environment and Hygiene (Environment) Compliance Standards

(1) Rubbish and Waste Clearance

Clearance of Construction Debris: There are no piles of construction debris on site, such as cement bags, rebar offcuts, timber battens or scrap pipework. All waste has been deposited at the site's designated waste collection points.

Compliant Disposal of Hazardous Waste: Where hazardous waste is involved, such as asbestos, lead-based paint, waste oil or chemical containers, it must be disposed of in accordance with regulations by a contractor certified by the Environmental Protection Department (EPD), and valid transfer notes or disposal certificates must be provided.

(2) Site Restoration and Pollution Remediation

Ground Restoration: Any damage to hardened surfaces, excavation pits or trenches caused by construction works has been backfilled and leveled, restoring the site to a state that harmonizes with the surrounding environment, with no risk of subsidence or water accumulation.

Contamination Removal: There are no visible oil stains, chemical residues or discolored soil within the construction area. Where contamination is present, the contaminated soil must be cleared or remediated.

Water Accumulation and Mosquito Breeding: All depressions or pits where water may accumulate have been leveled to eliminate conditions conducive to mosquito breeding.

Dust and Particulate Matter Control: There is no significant accumulation of dust on roads, equipment surfaces or inside buildings; sweeping or wet cleaning has been carried out.

(3) Public Utilities and the Surrounding Environment

Protection of underground utilities and facilities: Cables, water pipes, telecommunications fiber-optic cables and other utilities that were temporarily relocated or exposed during construction have been restored to their original condition or permanently repaired in accordance with regulations; there are no exposed or damaged sections.

Mitigation of Impact on Surrounding Roads and Communities: Damage to surrounding roads and pavements caused by construction has been repaired; temporary traffic facilities and hoardings have been removed, and public access has been restored.

4. Closed-loop documentation archiving: Complete documentation including subcontractor safety education, briefings, inspections, rectifications, emergency response, and assessments shall be organized, completely archived, forming a full-process HSE management closed loop.

Incident Reporting and Investigation

Incident Management Plan

The primary objective of this plan is to ensure that all accidents, near misses, occupational diseases (such as severe heatstroke), and environmental spill incidents (including fuel spills and wastewater overflows) occurring in workers' and management personnel's camps are systematically reported, thoroughly analyzed, and properly handled in accordance with the law, to prevent similar incidents from recurring. This procedure applies to all camp residents, subcontractors, management personnel, and visiting logistics drivers for the Program.

Scope

This document informs all project-related personnel on how to report incidents and provides guidance for health and safety enforcement departments and management teams on investigating and handling incidents.

Incident Classification

1. Near Miss (NM): An event that could have caused injury, damage, or loss but was avoided due to specific circumstances. Near misses are also referred to as "close calls" or "near accidents."

2. First Aid (FA): An injury requiring only one first aid treatment followed by a follow-up visit, typically involving minor injuries. Examples include minor abrasions, burns, and cuts that generally do not require complex medical care. In such cases, the individual can usually resume normal activities immediately.

3. Medical Treatment Case (MTC): An injury or illness requiring treatment by a doctor or medical personnel in accordance with a doctor's standard medical instructions.

4. Restricted Work Day Case (RWDC): A work-related injury that is non-fatal, does not result in absence from work, but causes the employee to be unable to fully perform all routine work duties on any day following the occupational injury. Such cases generally allow the employee to continue working, such as working part-time in their original position, or working full-time but unable to undertake all daily responsibilities.

5. Lost Work Day Case (LWDC): An occupational injury or occupational disease that prevents an individual from working on any day after the accident, excluding fatal injuries. This includes rest days, weekends, leave days, public holidays, and days after separation from employment.

6. Fatality: Resulting in the death of an employee.

8.4.13.25. Incident Classification Matrix

1. Level 1: Minor incidents/near-misses: Property damage of less than US$1,000; minor first-aid incidents; or traffic deviations resulting in near-collisions on the central carriageway or local roads.

2. Level 2: Moderate/Reportable: Medical treatment (restricted work, clinical rest due to heatstroke); localized environmental spills contained within a leveled area and not exceeding 50 liters; or small localized kitchen fires.

3. Level 3: Major/Serious Incidents: Lost-time injuries (LTI), collapse of prefabricated structural units, severe heatstroke emergencies requiring hospitalization, fuel/oil or chemical leaks entering the community drainage system, or sewage leaks from sedimentation tanks.

Table 177 presents the incident severity classification matrix.

Table 177***: Incident Severity Classification Matrix***

Level	Category Name	Personal Injury	Property Damage	Environmental Incident	Road traffic accidents	Fire/Explosion
1	Minor incidents/emergencies	Minor injuries requiring first aid (e.g. minor grazes, cuts, sprains, not requiring hospital treatment); no loss of working hours	Less than US$1,000	/	Near-misses on the Central Lane or community roads (no actual collision or only minor scrapes)	/
2	Moderate/reportable incidents	Requiring medical treatment (e.g. stitches, immobilization) and resulting in work restrictions (reassignment or recuperation); clinical rest required due to heatstroke (medically prescribed rest); documented reportable incidents	US$1,000 – 10,000	A localized spill occurring on a level surface, which has been effectively contained and where the volume of the spill does not exceed 50 liters	/	A small localized fire in a kitchen area (which did not spread and was extinguished on the spot)
3	Major/Serious Incidents	Loss-time injury (LTI) resulting in work stoppage; emergency treatment for severe heatstroke requiring hospitalization; serious injury (e.g. fracture, amputation)	Exceeding US$10,000	Spills of fuel, oil or chemicals into the local drainage system; sewage leaks from sedimentation tanks causing environmental pollution	/	Collapse of a prefabricated unit structure; fire spreading to storage areas or equipment

Additional notes: Priority determination: Classification follows the ‘higher-over-lower’ principle. Where an incident triggers the criteria for a higher level in any dimension, it shall be treated at the highest level. For example: if property damage is less than $1,000 but heatstroke has resulted in hospitalization, the incident shall be treated as Level 3.

Incident Reporting at

1. In the event of an incident, a verbal report must be made immediately to the relevant supervisor. The incident report form must be completed within two hours of the incident occurring.

2. If an incident results in a spill extending beyond the facility boundaries or causes a fatality, the relevant regulatory authorities must be notified immediately.

3. Once completed, the form must be submitted to the HSE Manager for review.

Incident Report Form

To be completed by the person who discovered the incident or the area manager, and submitted to the camp HSE Manager within two hours of the incident occurring.

Table 178 presents the incident report form.

Table 178***: Incident Report Form***

1. Basic Information	
Date of incident:	Time of incident:_____ AM/PM
Exact location within the camp:	
▢ Workers’ accommodation ▢ Management office/residence	▢ Central vehicle access route
▢ Construction equipment charging area	▢ Wastewater/settling tank ▢ External community access corridor
Name of Reporter:	Position/Company:
2. Incident Type Classification (multiple selections permitted)	
▢ Injury/Illness (First Aid) ▢ Property/Structural Damage ▢ Vehicle Collision	
▢ Severe heat stress/heatstroke ▢ Fire/smoke outbreak ▢ Chemical/fuel spill	
▢ Sewage/Wastewater Leakage ▢ Near Miss	▢ Damage Caused by Natural Disasters
3. Preliminary description of the incident	

Briefly describe the sequence of events, the equipment involved and the emergency measures taken Consequences:	
4. Emergency Measures Taken	
Provide a detailed account of the emergency response measures implemented, the spill response kits deployed, power cut-offs and isolation measures, or the emergency services contacted, namely:	
Signature of the presenter	Date/Time

Figure 82 shows the accident report flowchart.

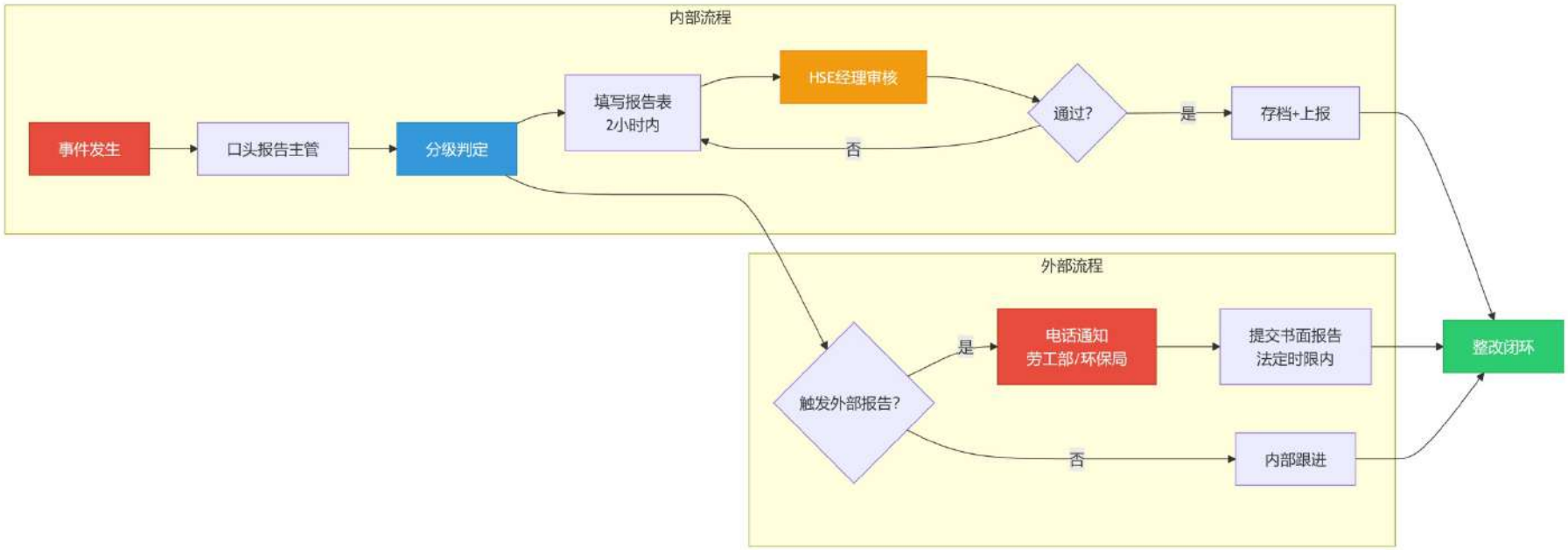


Figure 82**: Accident Report Flowchart**

Investigation of ‘ ’ Incidents

1. Upon receipt of a fully completed incident report form, the HSE Manager will initiate an investigation.

2. This investigation shall commence immediately; for incidents classified as Level 2 and Level 3, the report shall be completed within 7 days.

Incident Investigation Form

To be completed by the lead investigator (HSE Manager) within 7 days of a Level 2 or Level 3 incident occurring.

1. Investigation Management

- Incident Reference Number: _____

- Investigation Commencement Date: _____

- Investigation Team Members:_____ _____

2. Comprehensive Fact-Finding and Timeline Analysis

(Including witness statements, photographic evidence and maintenance records for equipment/settling tanks)

System/charging panel (if applicable).

3. Root Cause Analysis (Five-Question Method)

- Statement of the problem (the incident itself): _____

- Cause? (Level 1): _____

- Cause? (Level 2): _____

- Cause? (Level 3): _____

- Cause? (Level 4): _____

- Cause? (Level 5 – Root Cause): _____

8.4.13.26. Corrective and Preventative Action (CAPA) Plan

Corrective actions must address the root cause to ensure long-term and effective prevention and control.

Table 179 presents the corrective action plan template.

Table 179***: Corrective action plan template***

#	Description of corrective action	Person responsible	Target Completion Date	Required Documentation
1	**For example: rearranging charging racks, carrying out maintenance on sewage treatment facilities and**			

#	Description of corrective action	Person responsible	Target Completion Date	Required Documentation
	valves, and installing additional signage			
2				
3				

Signature of the person in charge of the investigation: _____ Date: _____

Project Manager's Approval: _____ Date: _____

Closure of an ' ' Incident

1. Once all aspects of the incident have been resolved, the closure form should be completed.

2. This serves as a component of the system to ensure that all corrective actions are completed in accordance with the investigation requirements.

3. It enables the team to record all information relating to the incident on a single form, thereby making it easier to identify the lessons learned from the incident.

Incident Closure Form

Reference No.: HSE-CL-_____ **Date of Closure: ____ Year ____ Month ____ Day**

I. Basic Information

Table 180 presents the incident closure form: basic information.

Table 180***: Incident closure form: basic information***

Project Name	
Incident Report Number	HSE-IR-_____
Incident Investigation Number	HSE-INV-_____
Date of Incident	____ year ____ month ____ day
Incident Severity	☐ Level 1 (Minor) ☐ Level 2 (Moderate) ☐ Level 3 (Serious)

Incident Type	☐ Personal injury ☐ Property damage ☐ Environmental spill ☐ Fire/explosion ☐ Structural collapse ☐ Road traffic accident ☐ Other: _____

II. Incident Summary

Table 181 presents the incident closure form: incident summary.

Table* 181*: Incident closure form: incident summary

Course of Events	
Direct Consequences	Personal injury: _____ Property damage: $_____ Volume of environmental spill: _____
Root Cause	

III. Status of Rectification Measures

Table 182 presents the incident closure form: status of rectification measures.

Table* 182*: Incident closure form: status of rectification measures

No.	**Corrective Action**	**Person Responsible**	**Planned Completion Date**	**Actual Completion Date**	**Status**
1					☐ Completed ☐ Not completed
2					☐ Completed ☐ Not completed

IV. Outstanding Issues and Follow-up

Table 183 presents the incident closure form: outstanding issues and follow-up.

Table* 183*: Incident closure form: outstanding issues and follow-up

No.	**Outstanding Issues**	**Planned Completion Date**	**Person responsible for follow-up**	**Status**
1				☐ In progress ☐ To be initiated

No.	Outstanding Issues	Planned Completion Date	Person responsible for follow-up	Status
2				☐ In progress ☐ To be initiated

If there are no outstanding issues, enter 'None'.

V. Summary of Costs

Table 184 presents the incident closure form: summary of costs.

Table 184***: Incident closure form: summary of costs***

Cost Category	Amount (US dollars)
Property damage	$
Environmental Clean-up/Remediation	$
Medical/Compensation	$
Loss of business	$
Fines/Penalties	$
Total	**$**

VI. Lessons learned (optional)

VII. Signatures and Approval

Table 185 presents the incident closure form: signatures and approval.

Table 185***: Incident closure form: signatures and approval***

Role	Recommendation for Case Closure	Signature	Date
Investigator	☐ Recommend closure ☐ Defer		
HSE Manager	☐ Agree to close the case ☐ Postpone		

Role	Recommendation for Case Closure	Signature	Date
Subcontractor's Representative	☐ Confirm completion ☐ Object		
Project Manager	☐ Approve closure ☐ Return		

VIII. List of Documents to be Filed

Table 186 presents the incident closure form: list of documents to be filed.

Table** 186**: Incident closure form: list of documents to be filed

Document	Status
Incident Report Form (HSE-IR)	☐ Archived
Incident Investigation Form (HSE-INV)	☐ Archived
On-site photographs/videos/sketches	☐ Archived
Rectification Acceptance Record	☐ Archived
External report acknowledgment (if applicable)	☐ Archived

Important Notes

1. **Conditions for case closure**: All rectification measures have been accepted as satisfactory; responsibility for following up on outstanding issues has been assigned; external government reports on Level 3 incidents have been submitted to the Barbados Ministry of Labour/Environmental Protection Department in accordance with regulations.

2. Extension of the closure deadline: Should an extension be required, written approval must be obtained from the project manager, specifying the anticipated closure date and the reason for the extension.

3. Record retention: Closure records must be retained for at least five years for compliance audits by the Ministry of Labour.

4. Coordination with handover acceptance: Where the incident involves subcontractor liability, the 'rectification completed' status on the closure form will serve as one of the prerequisite review items for the subcontractor's HSE-specific handover acceptance. Subcontractors with unresolved incidents shall not be permitted to complete handover procedures.

Following an incident

1. Once the incident investigation is complete, any relevant procedures requiring updating must be addressed.

2. The lessons learned from this incident should be discussed with all staff.

3. A brief summary of the incident and the lessons learned must be posted on the HSE noticeboard.

HSE Records and Documentation Management

Records Management

A comprehensive project HSE record-keeping system shall be established, comprising:

- Personnel health records (contents: pre-employment medical examination reports, medical examinations following changes in job role, and records of work-related injury treatment;
    - update frequency: records to be created upon commencement of employment and updated within 24 hours of any health incident);
- Training and assessment records (contents: three-tier safety education, safety technical briefings, daily pre-shift meeting minutes, records of specialized training and re-education for safety violations;
    - Update frequency: filed within 24 hours of the completion of each training session or briefing);
- Hazard Identification and Rectification Records (Contents: routine inspection records, special inspection records, hazard rectification notices, rectification acceptance forms, and special reports on major hazards;
    - Update frequency: filed within 24 hours of rectification acceptance);
- Work Permit Records (Contents: hot work permits, confined space work permits, lifting operation permits, etc.;
    - Update frequency: issued prior to work commencement; filed upon completion of the operation),
- Equipment Maintenance and Servicing Register (Contents: Equipment acceptance records upon arrival, routine inspection records, periodic maintenance records, equipment fault/repair records, equipment scrapping records;
    - Update frequency: Within 24 hours of each inspection or maintenance activity),
- Emergency Drill Register (Contents: Annual emergency drill plan, drill procedures, attendance sheets, photographs/videos of the drill process, drill evaluation reports, drill summaries and improvement measures;
    - Update frequency: Completed and archived within 48 hours of each drill),
- Environmental Monitoring Log (Contents: Dust monitoring records, noise monitoring records, waste collection and removal records (including hazardous waste transfer forms), oil/chemical spill records;
    - Update frequency: Monitoring carried out according to scheduled frequency; incidents exceeding limits reported immediately),
- Incident Record Register (Contents: Incident Report Form (HSE-IR), Incident Investigation Form (HSE-INV), Incident Closure Form (HSE-CL), incident statistics and analysis reports, external

report records (acknowledgment slips from the Ministry of Labour/Environmental Protection Bureau);

- Update frequency: within 24 hours of completion of relevant forms), PPE issue ledger (contents: PPE issue register, periodic replacement records; update frequency: updated in real time after each issue/replacement), etc., to ensure full traceability and verifiability throughout the process.

Information Reporting and Communication

A routine HSE meeting mechanism shall be established, with weekly HSE regular meetings and monthly special meetings to summarize management status, rectify issues, and plan the next phase of work. HSE monthly reports, quarterly reports, and various specialized materials shall be submitted to the Employer, general contractor, and local regulatory authorities on schedule. All-staff HSE information feedback channels shall be kept open, encouraging hazard reporting and issue feedback.

Supplementary Provisions

1. This plan takes effect from the date of project commencement and covers the full construction period of the project until engineering completion acceptance and site clearance are completed.

2. This plan may be revised and improved in a timely manner in accordance with project construction progress, changes in on-site risks, updates to local regulations, and Employer requirement adjustments. After revision, all personnel shall implement the updated plan.

3. This plan is to be interpreted and implemented by the project's dedicated HSE management department.

8.4.14. Incident Management Plan

The primary goal of this plan is to ensure that all accidents, near misses, occupational illnesses (such as severe heat exhaustion), and environmental releases (including fuel spills and wastewater overflows) within the Workers' and Management Camp are systematically reported, thoroughly analyzed, and legally resolved to prevent future occurrences. This procedure applies to all residents, subcontractors, management personnel, and visiting logistics drivers.

Scope

This document informs all individuals involved in the project about how to report an incident. It provides guidance to the HSE and Management team on investigating and resolving incidents.

Incident classification

- **Near Miss (NM):** An event that had the potential to cause injury, damage, or loss but was avoided due to circumstances. Near misses are also referred to as 'close calls' or 'near hits.'
- **First Aid (FA):** An injury that requires just one first aid treatment and a follow-up visit typically involves only minor injuries. Examples include minor scratches, burns, and cuts, which usually do not require extensive medical care. In these cases, the person can often return to their normal activities right away.
- **Medical Treatment Case (MTC):** An injury or disease that requires treatment from a physician or medical personnel under the standing orders of a physician.

- **Restricted Workday Case (RWDC**): A work-related injury is defined as any injury that is not fatal and does not result in a lost workday but leaves a person unable to fully perform their regular job duties on any day following the occupational injury. These types of incidents typically allow the employee to continue working, either by performing part-time duties in their regular position or by working full-time but not carrying out all of their usual responsibilities.
- **Lost workday case (LWDC):** An occupational injury or illness, excluding fatal injuries, occurs when an individual is unable to work on any day following the incident. This includes rest days, weekends, leave days, public holidays, and days after the end of employment.
- **Fatality:** An incident that results in the death of an employee.

Incident classification matrix

- **Tier 1: Minor / Near-Miss:** Property damage under $1,000, minor first-aid cases, or near-miss traffic deviations on the central driveway or community road.
- **Tier 2: Medium / Recordable:** Medical treatment cases (restricted work, heat exhaustion requiring clinical rest), localized environmental spills under 50 liters contained inside the leveling yard, or minor localized kitchen fires.
- **Tier 3: Major / Critical:** Lost Time Injuries (LTI), structural collapse of prefabricated units, severe heat stroke emergencies requiring hospitalization, fuel/oil chemical spills escaping into community drainage, or sewage breaches from the sedimentation tanks.

Procedure

Incident reporting

- When an incident occurs, it must be reported immediately (verbally) to the relevant supervisor.
- The Incident Reporting Form must be completed within two hours of the incident.
- If an incident results in a spill that extends beyond the facility's boundaries or causes a death, the relevant authorities must be informed without delay.
- Once the form is completed, it should be submitted to the HSE Manager for review.

Incident investigation

- Upon receiving the completed Incident Reporting Form, the HSE Manager will initiate an investigation.
- This investigation will commence immediately, and a report should be completed within 7 days for incidents classified as Tier 2 and Tier 3.

Incident closure

- Once all aspects of the incident have been completed, the close-out form should be filled out.
- This serves as a unit of the system to ensure all corrective actions are completed according to the requirements of the investigation.
- It allows the team to document all the information related to the incident on one form, making it easier to identify the lessons learned from the incident.

Post incident

- Once an incident investigation is complete, any relevant procedures that need updating must be addressed.

- Lessons learned from the incident should be discussed with all employees.
- A summary of the incident and the lessons learned must be posted on the HSE notice board.

Incident investigation form

To be completed by the Lead Investigator (HSE manager) within 7 days for Tier 2 and Tier 3 incidents.

Investigation administration

- **Incident Reference Number:**
- **Date Investigation Commenced:**
- **Investigation Team Members:**

2. Comprehensive Fact-Finding & Chronology

(Attach witness statements, photographic evidence, and maintenance logs for equipment/sedimentation systems/charging boards as applicable).

3. Root Cause Analysis (The 5-Whys Methodology)

- **Problem Statement (The Incident Event):**
- **Why? (1):**
- **Why? (2):**
- **Why? (3):**
- **Why? (4):**
- **Why? (5 - Root Cause):**

Corrective and Preventive Actions (CAPA) Plan

Actions must target the underlying root cause to ensure long-term mitigation.

Table 187 presents the corrective and preventive actions plan.

Table 187***: Corrective and Preventive Actions Plan***

#	Action Item Description	Responsible Person	Target Date	Resources Required
1	*e.g., Relocate charging racks, service sewage valves, and add signs*			
2				
3				

Lead Investigator Signature: Date: Project **Manager Review: Date:**

Incident reporting form

To be filled out by the discovering person or area warden and submitted to the Camp HSE Officer within 2 hours of the event.

Incidents are recorded on the form reproduced at Table 188.

Table** 188**: Incident Reporting Form

1. GENERAL INFORMATION	
Date of Incident:	**Time of Incident:** _ AM/PM
Exact Location within Camp:	
• **Workers' Living Dormitories** • **Management Offices / Housing**	• Central Vehicle Driveway
• **Construction Tool Charging Area**	• Waste / Sedimentation Tanks • External Community Access Corridor
Name of Reporting Person:	**Job Title / Company:**
2. INCIDENT TYPE CLASSIFICATION (Check all that apply)	
• **Injury / Illness (First Aid)** • **Property / Structural Damage** • **Vehicle Collision**	
• **Severe Heat Stress / Exhaustion** • **Fire / Smoke Outbreak** • **Chemical / Fuel Spill**	
• **Wastewater / Sewage Spill** • **Near-Miss Event** • **Natural Disaster Damage**	
3. INITIAL DESCRIPTION OF THE EVENT	
Provide a summary of what happened, equipment involved, and immediate consequences:	
4. IMMEDIATE ACTIONS TAKEN	
Detail first aid applied, spill kits deployed, power isolations, or emergency services called:	
Reporting Person Signature	**Date/Time**

8.4.15. Social Management Plan

The Social Management Plan is a tool that is utilized by development practitioners to control, minimize, and/ or mitigate the potential social risks and impacts identified during project scoping analysis.

The SIA identified social impacts. In response, the social management plan has been developed to address the anticipated negative social impacts identified in the SIA. The social management plan sets out the procedures that will be undertaken by the project to circumvent the potential impacts.

Social impacts are anticipated during the construction and operational phases of the project. Construction phase impacts are deemed to be temporary or reversible. Much of the operational phase impacts can be mitigated through awareness of the potential impacts, research on best practices, and prudent implementation and monitoring of mitigation measures in the development of the Workers' Camp.

Companion documents and related management plans

A number of the measures relied upon in this Social Management Plan are set out in full in companion documents prepared alongside this ESIA/ESMP rather than reproduced here. This is deliberate: duplicating the same commitment in two documents creates version drift and makes it impossible to tell which text governs. The table below records each companion document, who owns it, its status at the date of this submission, what this ESIA/ESMP relies on it for, and where it is cross-referenced. Where a companion document is still in draft, the commitment in this ESIA/ESMP stands and the companion document elaborates it; where the two differ, this ESIA/ESMP governs until the companion document is approved by the Project Execution Unit.

Table** 189**: Companion documents relied upon by this ESIA/ESMP

Document	Owner	Status at 8 August 2026	What this ESIA/ESMP relies on it for	Where cross-referenced
Labor Management Plan	Contractor (CRSEG), prepared with SAEDI Consulting	Draft issued 8 August 2026	Workforce profile and composition; recruitment and employment conditions; worker welfare and accommodation standards; occupational health and safety; working hours, wages, rest days and freedom of association; provisions for foreign workers including immigration compliance, accommodation standards, equal protection and translation.	Social Management Plan; Social Impact Assessment Matrix rows for Workers' Rights, Discrimination in hiring, Gender Pay Gap and Unfair Treatment.
Workers' Code of Conduct	Contractor (CRSEG)	Version 2, under revision	Mandatory standards of behavior for all workers, subcontractors, security personnel and service providers; prohibition of sexual harassment, sexual exploitation and abuse and gender-based violence; disciplinary framework; induction and periodic refresher training with attendance	Social Management Plan; SH/SEA/GBV provisions; Community Health and Safety Plan; Worker Influx Management Plan.

Document	Owner	Status at 8 August 2026	What this ESIA/ESMP relies on it for	Where cross-referenced
			records; display at prominent worksite locations in languages commonly spoken; signed worker declaration.	
Grievance Redress Mechanism	Contractor (CRSEG), with the Project Execution Unit	Draft issued 7 August 2026	Channels and protocols for workers, community members and other stakeholders; process flow and response timelines; membership of the Grievance Committee; escalation route beyond initial acknowledgment; grievance form and register templates; confidential survivor-centered pathway for SH/SEA/GBV cases; protection from retaliation.	Grievance section of this document; Stakeholder Engagement; Social Management Plan; Traffic Management Plan.
SH/SEA/GBV Prevention and Response Plan	Contractor (CRSEG), with the Project Execution Unit	Draft issued 7 August 2026	The standalone management framework required by IDB Annex 1, comprising confidential reporting channels, survivor-centered referral arrangements, sanctions and disciplinary framework, monitoring and reporting indicators, and training and awareness requirements with records of participation; referral pathway mapping with named services and contact details.	Social Impact Assessment Matrix row for SH/SEA/GBV; Grievance section; Community Health and Safety Plan; Code of Conduct.
Stakeholder Engagement Plan	Contractor (CRSEG)	Inputs issued 7 August 2026	Stakeholder identification and analysis disaggregated into women's groups, youth groups, organizations of persons with disabilities, farmers' associations, non-governmental and civil society organizations and GBV support service providers; gender-sensitive and inclusive engagement methods covering meeting times, safe spaces and accessible venues; engagement calendar by project phase; disclosure and feedback arrangements.	Stakeholder Engagement section; Social Management Plan; Grievance section.
Community Health Assessment and Community Health Plan	Project Execution Unit with SAEDI Consulting	Draft under preparation	Community health baseline for the area of influence; assessment of wastewater exposure pathways and vector-borne disease; capacity of local health services and referral arrangements; health monitoring indicators.	Community Health and Safety Plan; Social Baseline; Social Impact Assessment Matrix row for Community Health Risks.

Document	Owner	Status at 8 August 2026	What this ESIA/ESMP relies on it for	Where cross-referenced
Critical Habitat Assessment and Biodiversity Action Plan	To be commissioned under the SCSTP and SCWRRF Studies Report	Drafting due 27 September 2026; finalization 15 October 2026	Critical habitat determination for the Graeme Hall interface; verification and refinement of the priority ecosystem services identified in this document; biodiversity mitigation and monitoring commitments.	Biological Environment chapter; Ecosystem Services of the Workers' Campsite Area; Social Impact Assessment Matrix.
Workers' HSE Management Manual (corporate)	Contractor (CRSEG)	Issued; to be annexed to this ESIA/ESMP	The corporate occupational health and safety framework applying to all CRSEG operations and activities, which applies in full to camp personnel alongside the camp-specific plans in this document.	Workers' Health and Safety Plan; Emergency Response Plan.

The Social Management Matrix later in this chapter names a number of plans that do not appear as separate sections of this document. For the avoidance of doubt, each sits within one of the instruments above or within this ESIA/ESMP, as follows. The Health Plan, Project Health Plan and Health Management Plan are delivered through the Workers' Health and Safety Plan and the Community Health and Safety Plan of this document, with the community-facing elements drawn from the Community Health Assessment. The Communication Plan and Social and Cultural Engagements are delivered through the Stakeholder Engagement Plan. The Project Utility and Consumption Management Plan is delivered through the camp description and the resource efficiency provisions of this ESIA/ESMP. The Hiring Plan and Recruitment Plan are delivered through the Labor Management Plan, as is the Gender Sensitive Construction and Site Plan. The Inflation Management Plan and Housing Plan are delivered through the Worker Influx Management Plan at Appendix 4. The Cultural Integration Training and Onboarding Plan is delivered through the induction and training requirements of the Workers' Code of Conduct. The SGBV Management Plan is the SH/SEA/GBV Prevention and Response Plan listed above. No plan named in the Social Management Matrix is without an owner or a home.

Mitigations of Impacts (Design Phase)

There are no anticipated impacts to the environment during the design phase of the project. As a result, mitigation measures are not defined for this phase of the Project.

The mitigation and monitoring commitments of this Social Management Plan are set out at Table 190. Each row is keyed to the corresponding row of the Social Impact Assessment Matrix at Part A and Part B, so that a commitment can be traced to the impact it answers and to the residual rating it is relied upon to achieve. Commitments are expressed as obligations of the Contractor unless another party is named. Where an indicator cannot yet be measured because baseline data is outstanding, the row says so and the dependency is carried at Part D.

8.4.15.1. Social mitigation matrix

Table 190 sets out, for each row of the Social Impact Assessment Matrix, the mitigation commitment relied upon, the indicator against which delivery is verified, the timing and frequency, and the party responsible.

Table** 190**: Social Management Matrix

Ref	Impact	Mitigation commitment	Indicator and verification	Timing	Responsible
A1.1	Congestion and delay on the community road and at the junction with the highway	The Contractor shall implement a Traffic Management Plan approved by the PEU and the BWA covering haul routes, peak-hour restrictions, signage, flaggers and temporary diversions. Movement windows shall avoid school travel times. Access for residents, businesses and emergency vehicles shall be maintained at all times except for short pre-notified closures. Should be agreed and periodically reviewed with the CLO and community representatives.	Complaints logged through the GRM; disaggregated; record of quarterly movement-window reviews	Plan approved before mobilization; windows reviewed quarterly and on any change to the delivery schedule	Contractor; PEU; Supervising Consultants; law enforcement (traffic)
A1.2	Vehicular accidents involving workers, community members or pedestrians	All drivers shall be briefed and inducted on speed limits, haul routes, reversing, pedestrian awareness and fatigue management including instruction on zero-tolerance for SH/SEA/GB toward community members consistent with the Code of the Conduct. Trained flaggers in high-visibility PPE shall be stationed at high-risk junctions and near schools, businesses and churches. Movement shall be restricted from 14:30 to protect school children. Vehicles shall be inspected and maintained in safe working order and drivers shall be fit for duty. Random drug and alcohol testing shall apply to employees and subcontractors.	Incidents and near-misses reported to the PEU immediately; driver-behavior complaints in the GRM; disaggregated; disciplinary records under the Code of Conduct	Induction before first site access, refreshed annually; incidents reported immediately	Contractor; PEU; Supervising Consultants; law enforcement (traffic)
A2.1	Interruption to water, electricity or telecommunications serving nearby households	The Contractor shall agree a utilities management schedule with each operator before work begins, covering risks, planned outages and restoration procedures. Planned outages shall be notified in advance through the	Log of outages and restoration times; outage-related complaints through the GRM	Schedule agreed before work begins; outage log reported monthly to the	Contractor; PEU; Supervising Consultants; utility operators

Ref	Impact	Mitigation commitment	Indicator and verification	Timing	Responsible
	and businesses	Stakeholder Engagement Plan and sequencing shall minimize disruption to critical users. Unplanned disruptions shall be reported and addressed through the GRM.		PEU	
A2.2	Increased demand on water, electricity, health care, waste services and housing	The camp shall be operated for self-sufficiency in water, power and sanitation so far as practicable, under a utility consumption and management plan. On-site primary care shall be provided under the project health plan so that workers do not displace community access to health services. Worker transport shall be provided to reduce local pressure.	Consumption against the pre-construction baseline; workforce numbers against the assumed peak of 120 residents and 252 on site; GRM complaints	Consumption monitored monthly and reported quarterly; reviewed if the workforce exceeds the assumed peak	Contractor; PEU; Supervising Consultants
A3.1	Fugitive dust affecting nearby residences, farmland and the Ministry of Agriculture office	The Contractor shall adhere to EPD dust parameters and implement a dust suppression management plan covering watering of haul routes and stockpiles, covered loads, wheel-wash and speed restrictions. Cleared areas shall be progressively stabilized. Works shall be suspended in high wind where suppression cannot be maintained. Inform nearby households and communities of dust control measures and complaint channels through the GRM.	Daily visual inspection record; particulate monitoring at the nearest receptor; dust complaints in the GRM	Daily during earthworks; instrumental monitoring at defined construction stages	Contractor; PEU; Supervising Consultants
A3.2	Disruption to daily routines, access, trading and community events	The Contractor shall publish a disruption schedule under the community engagement and communication plan, schedule disruptive activities in off-peak hours, and adjust scheduling around religious, school and community events where feasible. Disruptions shall be reported through the GRM. Adjusted where feasible to limit impacts on peak times and caregiving routines.	Notice issued against the seven-day requirement; attendance at community meetings; disaggregated; complaints in the GRM disaggregated	At least seven days advance notice of planned disruption; community meetings quarterly	Contractor; PEU; Supervising Consultants

Ref	Impact	Mitigation commitment	Indicator and verification	Timing	Responsible
A3.3	Noise disturbance at the nearest residential receptors, including overnight generator operation	The Contractor shall adhere to EPD parameters and implement the Noise Management Plan, including acoustic screening of generators, restrictions on night-time plant operation, selection of lower-noise equipment and maintenance of silencers. Worker exposure shall be controlled under the Workers' Health and Safety Plan.	Measured levels against 55 dBA by day and 45 dBA at night at the nearest receptor; complaints in the GRM. A night-time baseline has not yet been measured and is required before the residual rating can be confirmed.	Continuous at Location 3 and on complaint; night-time baseline before generator operation begins	Contractor; PEU; Supervising Consultants
A4.1	Localized price escalation for food, goods, services and rental accommodation	Local procurement shall be prioritized where quality and safety standards can be met, unit costs are competitive and procurement does not cause significant price escalation for local consumers. A housing plan shall limit competition for local rental stock. Inflation shall be monitored against a pre-construction price baseline for key commodities. Consider the potential impact on women-headed and low-income renter households	Proportion of goods and services procured locally; price trend for key commodities against the baseline. The baseline has not yet been established. Price trends.	Baseline before mobilization; procurement and price trends reported quarterly	Contractor; PEU; Supervising Consultants
A4.2	Economic contraction at the end of construction as spending and employment cease	The Contractor shall deliver transferable training under the Local Skills Development and Inclusion Plan, give advance notice of demobilization timelines, and encourage supplier diversification so that local businesses are not dependent on a single contract.	Number of workers completing accredited training; proportion of suppliers with non-project revenue including the share of women-owned suppliers where feasible	Notice of demobilization timelines at least one quarter in advance; training completions reported at demobilization	Contractor; PEU; Supervising Consultants
A5.1	Labor influx effects on community	The Contractor shall implement the Worker Influx Management Plan together with the Code of	Grievances by category and origin	Plan in force from mobilization;	Contractor; PEU; Supervising

Ref	Impact	Mitigation commitment	Indicator and verification	Timing	Responsible
	cohesion, social dynamics and worker-community friction	Conduct, the GRM, the Stakeholder Engagement Plan and the Labor Management Plan, including a worker-community interaction protocol, prioritized local hiring with targets where applicable, a community awareness and outreach plan, and a multilingual communication strategy. Recruitment shall take place at recruitment offices rather than at the project site. Use gender-sensitive and inclusive methods including separate or safe spaces for women and girls to express concerns (data disaggregated) and monitoring of participation in meetings	disaggregated; workforce numbers and nationality mix. Numbers and nationality breakdown remain to be confirmed by the Contractor.	grievances reviewed monthly; plan reviewed on material change to the workforce or camp occupancy	Consultants
A5.2	Communicable and vector-borne disease, biological aerosols and hydrogen sulfide exposure	The Contractor shall implement the health management plan and the Community Health and Safety Plan, including specific assessment and control of wastewater exposure pathways, heat stress prevention with hydration and rest-break scheduling, vector control and elimination of standing water, coordination with local health authorities, and worker awareness training.	Health surveillance records; incident reports to the PEU; standing-water inspections. Monitoring requirements are provisional until the Community Health Assessment reports.	From mobilization; health surveillance continuous; incidents reported immediately	Contractor; PEU; Supervising Consultants; local health authorities
A5.3	Adverse effects on community cohesion, sense of security and public confidence in the project	The Contractor shall deliver cultural integration training and onboarding for all workers, structured social and cultural engagement with the community, and a Stakeholder Engagement Plan using gender-sensitive and inclusive methods regularly seek feedback on perceived safety and project acceptance. GRM outcomes shall be reported back to the community.	Grievance volume and sentiment; community meeting records disaggregated	From mobilization; grievances reviewed monthly; community meetings quarterly	Contractor; PEU; Supervising Consultants
A6.1	Sexual	The Contractor shall implement	Code of	Signature	Contractor;

Ref	Impact	Mitigation commitment	Indicator and verification	Timing	Responsible
	harassment, sexual exploitation and abuse, and gender-based violence in the community	the standalone SH/SEA/GBV Prevention and Response Plan, with confidential reporting channels, survivor-centered referral, a sanctions and disciplinary framework, monitoring indicators and training records. Signature of the Code of Conduct shall be a condition of site access and the Code shall be displayed in the languages commonly spoken on site. Induction training shall be mandatory, with refreshers for workers, supervisors, subcontractors and security personnel. The referral pathway to health, police, shelter, hotline and legal aid services shall be verified and kept current. Include community awareness activities so that women and other vulnerable groups know the Code of Conduct and GRM	Conduct signatures against headcount; training attendance by worker category disaggregated; confidential case register and referrals, reported in aggregate only	before site access; induction before first shift with quarterly refreshers; serious cases reported to the PEU immediately; aggregate reporting monthly	PEU; Supervising Consultants; law enforcement
A6.2	Physical, psychological or sexual harassment of workers by other workers, supervisors or security personnel	The Contractor shall maintain a written anti-harassment policy meeting the requirements of the Employment Sexual Harassment (Prevention) Act, 2017 and the Employment (Prevention of Discrimination) Act, 2020, extending to subcontractors, security personnel and service providers. Training shall be mandatory at induction with periodic refreshers and attendance records. Psychosocial hazards shall be included in the hazard identification and risk assessment. Recognize the heightened risks for women and vulnerable groups and implement the GRM including confidential reporting options and access to social support services	Training attendance records disaggregated; GRM cases handled under the survivor-centered protocol	Induction before first shift with periodic refreshers; grievances reviewed monthly	Contractor; PEU; Supervising Consultants; law enforcement
A7.1	Unfair treatment and discrimination	The Contractor shall apply a non-discrimination and equal opportunity policy consistent with	Grievances disaggregated by ground of	From recruitment; grievances	Contractor; PEU; Supervising

Ref	Impact	Mitigation commitment	Indicator and verification	Timing	Responsible
	on protected grounds	Barbadian law, a Code of Conduct with a clear disciplinary procedure, and training for supervisors and workers on respectful behavior and diversity. The GRM shall be accessible and confidential with protection from retaliation. These requirements shall be flowed down into every subcontract.	complaint; disciplinary outcomes recorded and reported, with anonymized analysis of trends	reviewed monthly; outcomes reported to the PEU	Consultants; law enforcement
A7.2	Engagement of persons below the legal working age, boys and girls may be at risk	The Contractor shall verify age at recruitment against official identity documents and maintain a Register of Young Persons. Compliance with national law and international standards shall be an express contractual obligation of every contractor and subcontractor, with defined sanctions for breach including termination. Hiring managers shall be trained.	Register of Young Persons; PEU audit of recruitment records; any suspected case referred to the competent authority	At every recruitment; records audited by the PEU quarterly; suspected cases reported immediately	Contractor; PEU; Supervising Consultants; law enforcement
A7.3	Discriminatory recruitment practices excluding women, persons with disabilities or other groups	The Contractor shall use written job descriptions and a documented selection process with non-discriminatory criteria consistent with Barbadian legislation, standardized scoring at shortlist and interview, and retention of recruitment records for audit. Vacancies shall be advertised through local media, accredited technical and vocational institutions and routes that reach women.	Applications, shortlists and appointments disaggregated by sex and role; any pattern of exclusion investigated and corrective action documented	At every recruitment round; outcomes reported quarterly	Contractor; PEU; Supervising Consultants
A7.4	Differential pay between women and men performing work of equal value	Pay shall be set by skills, qualifications and competencies against documented grades, and benchmarked against national labor market and construction sector rates rather than assumption. Pay-related grievances shall be handled through the GRM and payroll and HR records shall be available for audit. Implement corrective action with clear timelines if audits	Pay equity ratio by job grade; pay-related grievances disaggregated by sex	Grades set before recruitment; pay equity reported quarterly; wage audit annually	Contractor; PEU; Supervising Consultants

Ref	Impact	Mitigation commitment	Indicator and verification	Timing	Responsible
		identify unjustified differences			
A8.1	Breach of workers' rights on hours, overtime, wages, rest days, freedom of association and living conditions	The Contractor shall implement the Labor Management Plan covering PPE and amenities, fair and timely remuneration through accessible means, working hours and overtime limits, rest periods and rest days, freedom of association, and decent working and living conditions. Every worker shall hold a written contract in a language they understand, and conditions of work shall be posted at the site. Ensure the living and working conditions meet the needs of both women and men	Worker grievances disaggregated; HR, payroll and contractor employment register; unannounced inspections of camp conditions	From engagement; records reviewed monthly by the PEU; inspections unannounced	Contractor; PEU; Supervising Consultants
A8.2	Communication failure affecting worker safety, community engagement and access to the GRM	The Contractor shall implement a multilingual communication strategy as required by the IDB, engage interpreters in adequate number, and translate safety procedures, the Code of Conduct and GRM materials into the languages commonly spoken on site, including a Chinese-language worker declaration. Signage shall be pictorial as well as textual and all training shall be delivered in a language the worker understands. Consider nationality, gender and literacy differences and use oral and visual channels to effectively reach workers	Translation coverage against the workforce language profile; proportion of training delivered in language. The language profile has not yet been provided. Proportion of workers who can understand and describe how to access the GRM.	Translation in place before mobilization; coverage confirmed once the language profile is provided	Contractor; PEU; Supervising Consultants
B1.1	Creation of employment and transferable skills for residents of the area of influence	The Contractor shall operate a hiring plan prioritizing local recruitment on transparent terms, and a Local Skills Development and Inclusion Plan identifying training opportunities for women, youth, persons with disabilities and other vulnerable groups, with accredited training where feasible.	Jobs created disaggregated by sex, skill level and contract type, distinguishing temporary construction roles from longer-term operational roles. Percentage of	Throughout construction and into operation; reported quarterly	Contractor; PEU; Supervising Consultants

Ref	Impact	Mitigation commitment	Indicator and verification	Timing	Responsible
			women in total workforces and in technical roles		
B1.2	Beneficial supply, offtake or service agreements with defined stakeholder groups	The BWA and the PEU shall define which groups are engaged including women farmers, women-owned businesses and youth groups and on what terms under the Stakeholder Engagement Plan and shall record and report benefit-sharing commitments.	Agreements concluded and the groups party to them. The groups and terms are not yet defined. Identify women-led or women-owned where feasible	Groups and terms defined before operation; agreements reported annually	BWA; PEU; Contractor; PEU; Supervising Consultants
B2.1	Increased availability of reclaimed water for irrigation in designated agricultural zones	The BWA shall allocate reclaimed water equitably and sustainably to identified agricultural users, in coordination with the Ministry of Agriculture, Food and Nutritional Security. Groups engaged shall include women farmers, women-owned business and agreements designed and accessible to them	Volumes allocated and users served	Operation; reported annually	PEU on behalf of the Government of Barbados; BWA; MAFNS
B2.2	Potential reduction in irrigation cost for farmers	The BWA shall confirm allocation and pricing policy. Until it does, this benefit shall not be reported as an outcome of the project.	BWA pricing decision, which is a precondition to reporting	Not reported as a benefit until pricing policy is confirmed	PEU on behalf of the Government of Barbados; BWA
B2.3	Contribution to national food security through more reliable local production	Support shall be given through equitable allocation of reclaimed water to identified agricultural users including women and male farmers, smallholders and tenant farmers and coordination with the Ministry of Agriculture, Food and Nutritional Security.	Volumes allocated to agriculture. The contribution cannot be attributed to the project without a government plan linking reclaimed water to food security. Users disaggregated	Operation; allocation monitored annually	PEU on behalf of the Government of Barbados; MAFNS
B2.4	Greater availability of	As for B2.3. This is presented as a potential benefit dependent on	Allocation and pricing	Revisited once allocation and	PEU on behalf of

Ref	Impact	Mitigation commitment	Indicator and verification	Timing	Responsible
	locally grown produce and more stable food costs	allocation, pricing and market response, and not as a confirmed outcome. Access to affordable fresh produce for households	decisions, which are preconditions to reporting	pricing are settled	the Government of Barbados; BWA
B3.1	Improved environmental health and ecosystem services of the Graeme Hall Swamp and coastal zone	The PEU shall exercise management oversight on behalf of the Government and shall monitor performance against the priority ecosystem services identified in the Description of the Environment chapter.	Effluent and receiving water quality against the pre-project baseline, at the three lake stations and the bisecting canal used in 2010 and 2018	Operation; monitored to the frequency set in the monitoring program	PEU on behalf of the Government of Barbados
B3.2	Recharge of underground reservoirs and improved resilience of supply during drought	The PEU shall exercise management oversight on behalf of the Government and shall monitor recharge performance against the groundwater baseline once established.	Recharge volumes against the groundwater baseline. The baseline has not yet been established.	Operation; monitored once the baseline exists	PEU on behalf of the Government of Barbados; BWA
B3.3	Release of fiscal space for water security, climate resilience and critical infrastructure	The PEU shall exercise management oversight on behalf of the Government and shall report on the basis of the published IDB, EIB, GCF and Government of Barbados sources rather than by inference.	Savings applied to the project and the resulting investment	Operation; reported annually	PEU on behalf of the Government of Barbados

Gender monitoring plan

Table 191 gives the gender indicators, their data sources, the frequency of measurement and the reporting arrangements for each.

Table** 191**: Gender Monitoring Matrix

Description	Indicator	Data Source How will it be measured?	Frequency How often will it be measured	Responsibility Who will measure it?	Reporting Frequency and form of reporting
Reports of Gender-Based	Number of SH/SEA/GBV	Reports of Violence, GRM case register	Daily	Contractor and Supervisory	Immediately as

Description	Indicator	Data Source How will it be measured?	Frequency How often will it be measured	Responsibility Who will measure it?	Reporting Frequency and form of reporting
Violence and Harassment	Incidents/ allegations reported**, by channel (worker and community) and by origin; baseline 0 at 21 October 2026**			Consultant, Social Personnel	the cases arise, Monthly
Gender Segmentation of Workforce	Roles women occupy disaggregated**; share of Project positions held by women, by skill level, direct or subcontracted, local or non-local (baseline 21 of 252, 8.3 percent, all subcontracted); women completing Project-funded training or apprenticeships (baseline 0)**	Reports on the number of women in the workforce, HR and payroll records	Bi-Weekly	Contractor and Supervisory Consultant, Social Personnel	Bi- weekly meeting
Provision of Gender accommodation	State of Gendered Accommodation, occupancy within national standards	Reports on Condition, Inspection of facilities, checklists	Monthly, Weekly	Contractor and Supervisory Consultant	Monthly project report
Provision of gendered washrooms	Number, condition and usability of gendered bathrooms	Availability and sanitary state of bathrooms, inspection checklists, GRM and worker complaints	Bi-weekly	Contractor and Supervisory Consultant	Monthly Progress Report
Number of women enterprises	logs of enterprises supported	Log of Purchased,	Quarterly	Contractor and Supervisory	Monthly Progress

Description	Indicator	Data Source How will it be measured?	Frequency How often will it be measured	Responsibility Who will measure it?	Reporting Frequency and form of reporting
supported		vendor feedback survey		Consultant	Report
Gender-Based training provided to workers	Number of trainings conducted, change in knowledge and attitudes as measured by brief pre/post test or periodic surveys	Number of Trainings, registered, attendance, employee behavior toward each other, Number of incidents reported, procurement logs	Bi- monthly, at each major training cohort	Contractor and Supervisory Consultant	Monthly and Quarterly Progress Report
Gender-based training provided to community members	Number of trainings provided, gender awareness sessions held, disaggregated data on participants	Number of Trainings registered, attendance, employee behavior toward each other, Number of incidents reported	Quarterly, per session	Contractor and Supervisory Consultant	Quarterly, End of year report
Gender Pay	Complaints management salary bands recruitment plan, number of pay related grievances, disaggregated	Number of Grievances Logged, Payroll and HR records, GRM	Quarterly	Contractor and Supervisory Consultant	Yearly Project Report
Women in leadership and management roles	Number of women and men in decision-making roles and supervisory positions**; number and share of**	Management Organogram, HR data	Quarterly	Contractor and Supervisory Consultant	Monthly, Quarterly Project, Report

Description	Indicator	Data Source How will it be measured?	Frequency How often will it be measured	Responsibility Who will measure it?	Reporting Frequency and form of reporting
	women in supervisory and technical roles (baseline from Table 108)				
Scheduling of time off for women and males	Record of time off granted to women Records of Work Schedule, number and % of leave days taken by women and men	Time Sheet and leave records, worker feedback/GRM	Weekly	Contractor and Supervisory Consultant	Monthly, Quarterly Project Report
Participation of women in engagement	**Share of women among participants at consultations and engagement events, with age and disability disaggregation; number of events at which women's safety or GBV concerns were raised and answered**	**Attendance registers disaggregated by sex, age and disability; engagement log; commitments register**	**Every event**	**Community Liaison Officer; Social Personnel**	**Quarterly social monitoring report**
SEA/SH/ GBV case handling	**Share of SEA/SH/GBV cases handled within protocol: immediate acknowledgment, referral offered within 24 hours, survivor consent recorded, follow-up completed; number of referrals made to the services in Table 111 and**	**Confidential GRM register (restricted access); referral log**	**Monthly**	**SH/SEA/GBV focal point; HR Representative for worker cases**	**Monthly, anonymized and aggregated**

Description	Indicator	Data Source How will it be measured?	Frequency How often will it be measured	Responsibility Who will measure it?	Reporting Frequency and form of reporting
	accepted				
SEA/SH/ GBV training coverage	Workers and supervisors completing SEA/SH/GBV induction and annual refresher, by sex and nationality	Training records	Monthly during mobilization, then quarterly	Contractor HR; Supervisory Consultant	Monthly Progress Report
Awareness and trust in the GRM	Share of women and men in the Direct Area of Influence who know of the GRM and its confidential channel and consider it safe and accessible	Household awareness survey before camp occupation, then annually; Community Liaison Officer records	Baseline, then annually	Social Personnel	Annual social monitoring report
Host community exposure	Number of female-headed and renter households in the Direct Area of Influence; median rent for one- and two-bedroom units	Census 2021 baseline (Tables 45 and 46); rental monitoring under the Social Management Plan	Baseline, then semi-annually	Social Personnel	Semi-annual social monitoring report

8.4.16. Chance Find Procedure

On discovery of any material of possible archaeological, historical or cultural significance, work stops immediately in the affected area. The area is secured and protected from disturbance. The find is recorded with date, location, depth, description and photograph. The Health, Safety and Environment Representative notifies the Project Execution Unit, which notifies the Barbados Museum and Historical Society. Work does not resume in the affected area until written clearance is received. The find, the notification, the response and the clearance are entered in a Chance Finds Register retained for the life of the Project.

Workforce induction covers the recognition of possible finds and the obligation to stop and report, so that the procedure depends on the person operating the machine and not on a supervisor being present.

Excavation is expected within Project activities, which triggers the Performance Standard 8 requirement for a chance finds procedure.

Chance Finds Register

Record ID; date and time; GPS/location and work area; finder and supervisor; description and photographs; immediate stop-work and protection actions; persons/authorities notified and time; specialist assessment; approval and conditions for recommencing; close-out date and sign-off. The HSE/site manager shall retain this record with the heritage incident documentation and make it available for audit.

Chance-finds induction and competency check

All workers, equipment operators, supervisors and subcontractors shall receive a pre-work briefing on recognition of potentially archaeological or cultural materials (including pottery, stonework, artefacts and possible human remains), the requirement to stop work, protect the discovery, notify the supervisor and designated cultural-heritage lead, and the prohibition on unauthorised removal or restart. The subject shall be included in site induction and refreshed in toolbox talks before excavation or new ground disturbance. Attendance and understanding shall be recorded in the training register.

8.5. Monitoring, Verification and Auditability

The management plans in this chapter state what will be done, who will do it and how often it will be done. This section establishes how performance against them is measured, what level of performance triggers a corrective action, what record evidences each measurement, and to whom that record is reported. Its purpose is to allow compliance with this Environmental and Social Management Plan to be tested by a person who did not carry out the work, using records that exist independently of the account given by the party that produced them.

The requirements applied are those set out for the environmental and social monitoring program and for management plan review, update and reporting in the Terms of Reference for this assessment, read with the management program, monitoring and reporting obligations under Inter-American Development Bank Environmental and Social Performance Standard 1. Seven elements are required for each management measure: a monitoring indicator, a baseline or reference value where one applies, a method with a location and a frequency, a named party to measure and a separate named party to verify, a threshold at which a corrective action follows, a record that evidences the measurement, and a

reporting route. The provisions below supply those elements across all of the plans in this chapter, and they are followed by the procedure for updating this Plan and by the audit arrangements.

Where a management plan in this chapter already states an indicator, a frequency or a responsibility, that plan governs and the provisions here record the threshold, the verification record and the reporting route that complete it. Where a plan is silent, the provisions here apply. Responsibility for measurement sits with the Contractor in almost every case, because the Contractor holds the works, the plant and the workforce. Responsibility for verification is held separately, and it follows the delivery structure recorded at the Program Overview, with AECOM verifying matters arising under the construction contract as Contract Administrator, the Project Execution Unit verifying social and community matters and the overall performance of this Plan, and the Barbados Water Authority verifying matters touching the operation of the public treatment assets and the water resource.

8.5.1. Auditability Requirements and Where Each Is Met

The table below records each requirement, states what it means in practice, and identifies where in this document it is satisfied.

Table 192 presents the auditability requirements and the provision satisfying each.

Table** 192**: Auditability requirements and the provision satisfying each

Requirement	What it means in practice	Where it is satisfied
Monitoring indicator for each measure	A measurable quantity or a countable event standing in for performance of the measure, so that performance is established by measurement and not by assertion	The consolidated monitoring program at this section, read with the indicators already stated in the Noise Management Plan, the Community Health Plan and the gender monitoring matrix
Baseline or reference value	The measured starting condition, or the standard or limit, against which the indicator is judged	The April 2026 baseline campaign at the Shared Environmental and Social Baselines chapter, with its limitations and the action closing each recorded at Information Gaps and Assumptions
Method, location and frequency	How, where and how often the indicator is measured, stated precisely enough for a different person to repeat the measurement and obtain a comparable result	The consolidated monitoring program at this section
Named responsibility, separated between measurement and verification	The role accountable for taking the measurement, and a different role accountable for confirming it was taken and that the result is as reported	The consolidated monitoring program at this section, with the delivery structure at the Program Overview
Threshold triggering a corrective action	The value or the event at which the measure is treated as having failed, together with the response that follows and the person who may close it	The action thresholds and corrective action triggers at this section

Requirement	What it means in practice	Where it is satisfied
Verification record	The document the measurement creates, which the auditor inspects, held for a stated period and available to stated parties	The verification record register at this section, with the field templates reproduced in the management plans
Internal and external reporting	What is reported, by whom, to whom and at what interval, including reporting to the Government of Barbados and to the Bank	The internal and external reporting requirements at this section
Plan review and update	How this Plan changes in response to monitoring results, incidents or design changes, and how the change is recorded and approved	The review, update and corrective action provisions at this section
Audit and assurance	Who tests compliance, over what scope, how often, what the test produces and how findings are closed	The audit and assurance provisions at this section, with the non-conformance classification table

How to read this table. Each row names a requirement, explains it in ordinary terms, and identifies the provision that satisfies it. The third column is the one that establishes whether this Plan is capable of audit, because it shows that a provision exists against every requirement. Nothing in the table is itself a commitment. The commitments sit in the tables and the text that follow.

8.5.2. Monitoring Program and Indicator Register

The indicator register below is the reference list for the whole of this Environmental and Social Management Plan. Every indicator carries a reference, a method, a target, a frequency and a responsible role, and the indicator references used in the management measures by pathway and throughout the management plans resolve to this register. It is stated once here so that an indicator cited anywhere in this document has a single definition.

Monitoring Program

The monitoring program is the means by which the residual ratings in the impact assessment are verified by measurement and not assumed. Each indicator carries a method, a target, a frequency and the role responsible for it. Where a target cannot yet be expressed numerically because the governing standard or threshold is not confirmed, that is stated in the target field, and it is never left implicit, and the confirmation appears as a priority measure above.

Table 193 presents the monitoring program.

Table** 193**: Monitoring program

Ref	Indicator	Method	Target	Frequency	Responsible
WM-01	Turbidity and suspended solids at the wetland margin	Sampling and laboratory analysis	No deterioration attributable to the Project	Monthly during construction, and within 24 hours of any observed sediment release	Contractor HSE

Ref	Indicator	Method	Target	Frequency	Responsible
WM-02	Flow and water level at the eastern gully outfall	Gauged measurement	Within the design runoff regime	Quarterly through construction and the first two years of operation	Contractor, then Barbados Water Authority
WM-03	Cleared area against the approved extent	Survey record	Zero clearance outside the approved extent	Monthly during clearance	Contractor with ecological supervision
WM-04	Night-time light spill at the wetland boundary	Illuminance measurement at the boundary	Within the design value; no measurable spill into wetland habitat	At commissioning and annually	Contractor, then Barbados Water Authority
WM-05	Wetland boundary demarcation integrity and access incidents	Inspection and incident register	Zero access incidents beyond the demarcated boundary	Monthly	Contractor HSE
WM-06	Particulate matter at community and school receptors	Continuous monitoring	Zero exceedances of the guideline value adopted under the Air Quality and Dust Management Plan	Continuous, reported monthly	Contractor HSE
WM-07	Dust deposition at the wetland margin	Visual inspection and deposition gauge	No visible deposition attributable to the Project	Monthly and after any high-dust operation	Contractor with ecological supervision
WM-08	Noise at residential and school boundaries	Monitoring against the WHO Community Noise Guideline values	Zero sustained Project-attributable exceedances	Monthly and on complaint	Contractor HSE
WM-09	Heavy vehicle movements within restricted school-hour windows	Movement log audit	Zero	Weekly	Contractor logistics
WM-10	Pedestrian near misses involving Project vehicles	Incident register	Zero	Immediate and monthly	Contractor HSE
WM-11	Waste transfer records reconciled against arisings	Waste transfer documentation	100 percent to a government-approved site; zero unaccounted streams	Monthly	Contractor HSE

Ref	Indicator	Method	Target	Frequency	Responsible
WM-12	Site perimeter and eastern gully condition	Inspection record	No windblown material; no evidence of dumping at the wetland margin	Weekly	Contractor HSE
WM-13	Reclaimed water quality at the facility outlet	Continuous online monitoring of surrogate parameters with laboratory verification	Within the confirmed national standard for recharge and reuse; WHO guidance on the safe use of wastewater in agriculture applies as the interim reference until that standard is confirmed	Continuous, with automatic diversion on exceedance; reported monthly	Barbados Water Authority
WM-14	Groundwater quality at the recharge points and at down-gradient abstraction points	Sampling and laboratory analysis	No deterioration against the pre-recharge baseline	Quarterly	Barbados Water Authority
WM-15	Reclaimed water quality at each point of use	Sampling and laboratory analysis	Within the applicable standard for the permitted crop and application method	Before each irrigation season and quarterly in use	Barbados Water Authority
WM-16	Residual quantities, characterization and disposal records	Waste transfer records and laboratory characterization	100 percent to an authorized site	Records monthly; characterization annually and after any process or dosing change	Barbados Water Authority
WM-17	Hydrogen sulfide at the site boundary and the nearest community receptor	Continuous monitoring with alarm	Zero exceedances of the odor-based alarm threshold set in the Odor and Bioaerosol Management Plan	Continuous, reported monthly	Barbados Water Authority
WM-18	Odor complaints and response times	Grievance register	Response within 24 hours; all closed within seven days	Monthly	Project Execution Unit
WM-19	Specific energy consumption per cubic meter of reclaimed water	Metered record	Within the design value	Monthly	Barbados Water Authority

Ref	Indicator	Method	Target	Frequency	Responsible
WM-20	Greenhouse gas emissions, carbon dioxide, methane and other gases	Monitoring and inventory	Against the Contract non-carbon emissions commitment	Established before commissioning; reported annually	Contractor, then Barbados Water Authority
WM-21	Chance find register and induction records	Register and training record	100 percent induction of personnel engaged in ground works	On arrival; reviewed annually	Contractor HSE
WM-22	Turbidity at the conveyance works interface and downstream	Sampling and laboratory analysis	No deterioration attributable to the works	Daily during works	Contractor with ecological supervision
WM-23	Reinstatement condition at the conveyance works	Inspection and photographic record	Reinstated to pre-works condition	At completion and at six months	Ecological supervision
WM-24	Containment integrity and response exercise records	Inspection and exercise record	Zero containment failures; one response exercise annually	Containment weekly; exercise annually	Contractor HSE, then Barbados Water Authority
WM-25	Workforce composition and local content, disaggregated by sex and role	Human resources record	Against the Labor Management Plan commitments; female share tracked against the 8.3 percent baseline (21 of 252)	Monthly, reported quarterly to the Project Execution Unit	Contractor human resources
WM-26	Community complaints and concerns, disaggregated by sex of complainant and by subject	Grievance register	Declining trend; zero unresolved beyond the closure target	Monthly	Project Execution Unit
WM-27	Code of Conduct breaches, investigations and outcomes	Disciplinary register	100 percent of substantiated breaches sanctioned and recorded	Monthly	Contractor human resources

Ref	Indicator	Method	Target	Frequency	Responsible
WM-28	Reporting-pathway effectiveness for SEA, SH and GBV	Periodic social monitoring covering awareness, accessibility barriers, preferred channels, fear of retaliation and differences in access between groups	Awareness and accessibility demonstrated across all identified groups	Every six months	Party independent of the Contractor
WM-29	Standing water and vector breeding sites on the works area	Inspection record	Eliminated within 24 hours of identification	Weekly, and after rainfall	Contractor HSE
WM-30	Health-related grievances, disaggregated by sex and age	Grievance register	All reviewed monthly with the Ministry of Health	Monthly	Project Execution Unit
WM-31	Livelihood-related grievances, disaggregated by sex and by vendor, fisher, business and accommodation-provider status	Grievance register	All assessed within the target closure time, with the outcome recorded	Monthly	Project Execution Unit
WM-32	Combined complaint register across the reclamation facility, the plant upgrade and the workers' camp	Single register permitting attribution between components	No repeated unresolved complaint from the same receptor	Monthly	Project Execution Unit
WM-33	Grievances received, resolved and outstanding, disaggregated by sex and group	Grievance register	90 percent closed within the closure target set in the Grievance Redress Mechanism	Monthly	Project Execution Unit

Ref	Indicator	Method	Target	Frequency	Responsible
WM-34	Engagement effectiveness against the four review questions on stakeholder identification, accessibility and timeliness of disclosure, proportionality of methods, and whether feedback has been reflected	Engagement record review	A positive answer to all four	After each engagement round	Project Execution Unit

Monitoring Parameters

The parameters below are those sampled and analyzed under the monitoring program. Field parameters are measured on site with calibrated instruments. Laboratory parameters are analyzed by an accredited laboratory, with preservation method, holding time, container type and chain of custody recorded on the certificate of analysis for each sample.

Table 194 presents the monitoring parameters by medium.

Table** 194**: Monitoring parameters by medium

Medium	Field parameters	Laboratory parameters	Linked impact
Effluent at the plant outlet	Temperature, pH, dissolved oxygen, conductivity, turbidity	Total suspended solids, biochemical oxygen demand, chemical oxygen demand, ammonia, nitrate, nitrite, total nitrogen, total phosphorus, orthophosphate, fecal coliform, fecal enterococci, Escherichia coli, oil and grease, copper and other heavy metals	STP-EI-01, STP-EI-05
Receiving water in the Bisecting Canal and Eastern Marsh	Temperature, pH, salinity, conductivity, turbidity, dissolved oxygen	Total suspended solids, total dissolved solids, biochemical oxygen demand, ammonia, nitrate, total nitrogen, total phosphorus, chlorophyll a, fecal coliform, fecal enterococci	STP-EI-02
Reclaimed water at the facility outlet and each point of use	Turbidity, conductivity, residual chlorine, pH	Total suspended solids, biochemical oxygen demand, total nitrogen, total phosphorus, total coliform, fats oil and grease, total dissolved solids, against the design standard	PRJ-EI-09

Medium	Field parameters	Laboratory parameters	Linked impact
Groundwater at agreed monitoring points	Water level, temperature, pH, conductivity	Nitrate, nitrite, ammonia, chloride, total dissolved solids, fecal coliform, heavy metals, volatile and semi-volatile organic compounds, pesticides	PRJ-EI-04
Coastal water near the outfall and at bathing waters	Temperature, pH, salinity, turbidity	Fecal coliform, fecal enterococci, Escherichia coli, nutrients, total suspended solids, against recreational water quality criteria	STP-EI-05
Surface runoff at the wetland margin	Turbidity	Total suspended solids, compared against the upstream control	PRJ-EI-01
Air at residential and school receptors	Particulate matter at 10 and 2.5 micrometers, continuous	Sulfur dioxide, nitrogen dioxide, carbon monoxide, hydrogen sulfide, carbon dioxide and methane	STP-EI-06
Hydrogen sulfide at the site boundary and nearest receptor	Continuous with alarm threshold	Not applicable	STP-EI-03
Noise at residential and school receptors	LAeq and LAmax, daytime and night-time, Type 2 sound level meter	Not applicable	STP-EI-07

What this table shows. What gets sampled, where, and what triggers action. The effluent, receiving water and coastal rows follow the same discharge from the plant outlet through the wetland to the bathing waters, so they are read together. Hydrogen sulfide is the only parameter with a continuous alarm, because it can reach houses within minutes of something going wrong inside the plant.

Sampling frequency, location, responsible party and corrective action trigger for each parameter are set out in the monitoring program. Exceedances are reported to the Project Execution Unit within 24 hours of the result becoming available, together with the corrective action taken or proposed.

Key Performance Indicators

Delivery is measured against indicators with stated targets. Each is reported monthly to the Project Execution Unit against the contractual environmental, social, health and safety metrics.

Table 195 presents the key performance indicators.

Table** 195**: Key performance indicators

Ref	Indicator	Target
KPI-01	Unplanned bypass events at the existing plant	Zero
KPI-02	Planned bypass events exceeding authorized duration	Zero
KPI-03	Emergency bypass activations reaching the wetland	Zero
KPI-04	Notifications issued within the required timeframe	100 percent
KPI-05	Effluent quality deterioration below the recorded baseline	Zero

Ref	Indicator	Target
KPI-06	Sediment control breaches reaching the wetland	Zero
KPI-07	Clearance outside the approved footprint	Zero
KPI-08	Hydrogen sulfide alarm exceedances at the community receptor	Zero
KPI-09	Odor complaints investigated within 24 hours	100 percent
KPI-10	Particulate exceedances at the school receptor	Zero
KPI-11	Noise exceedances at the residential receptor outside permitted hours	Zero
KPI-12	Heavy vehicle movements within the school-hour restriction	Zero
KPI-13	Pedestrian near misses on the community access route	Zero, each investigated within 24 hours
KPI-14	Uncontrolled releases of fuel or chemicals	Zero
KPI-15	Waste and sludge movements with completed transfer notes	100 percent
KPI-16	Grievances resolved within the tier timeframe	100 percent
KPI-17	Workforce inducted on the Code of Conduct before site access	100 percent
KPI-18	Local content of the workforce	Against the Labor Management Plan baseline of 52.4 percent (132 of 252 posts)
KPI-19	Emergency drills completed and recorded	Quarterly, 100 percent
KPI-20	Reclaimed water quality compliance with the agreed specification	100 percent of samples
KPI-21	Effluent compliance with consent conditions after upgrade	100 percent of samples
KPI-22	Community engagement sessions held as scheduled	100 percent

What this table shows. How performance is measured. Most targets are zero, because these indicators count events the controls exist to prevent, so any occurrence is a failure and not a number to reduce. The four expressed as percentages work differently: they measure whether a process was followed, being grievances answered in time, workers inducted before entering site, waste movements documented and drills carried out.

The indicators above carry the WM prefix and apply across the Project. The plant upgrade carries a further series with the M prefix, covering the matters specific to a works that continues to operate while it is rebuilt, being discharge quality during each phase, bypass activation, receiving water quality, hydrogen sulfide at the boundary and the condition of the existing conveyance. The two series are read together, and an indicator cited anywhere in this document resolves to one of them.

Plant Upgrade Monitoring Program

Table 196 presents the SCSTP monitoring program.

Table** 196**: SCSTP monitoring program

Ref	Indicator	Method	Target	Frequency
M-01	Discharge quality at the plant outlet during each construction stage	Sampling and laboratory analysis	Within the applicable consent condition	Per the Operational Continuity Plan, and during every bypass
M-02	Bypass activation events, recording date, duration, volume, quality and receiving water	Event register	Zero unplanned activations	Immediate and monthly
M-03	Receiving water quality in the Bisecting Canal and Eastern Marsh	Sampling and laboratory analysis	No deterioration attributable to the Project	Monthly, and within 24 hours of any discharge event
M-04	Hydrogen sulfide at the site boundary and the nearest community receptor	Continuous monitoring with alarm	Zero exceedances of the alarm threshold	Continuous, reported monthly
M-05	Odor complaints and response times	Grievance register	All closed within seven days	Monthly
M-06	Sludge and screenings quantities and disposal records	Waste transfer records	100 percent to a government-approved site	Monthly
M-07	Particulate matter at community and school receptors	Continuous monitoring	Zero exceedances of the adopted guideline	Continuous, reported monthly
M-08	Noise at residential and school boundaries	Monitoring against the World Health Organization Community Noise Guideline values	Zero exceedances	Monthly and on complaint
M-09	Heavy vehicle movements within restricted school hour windows	Movement log audit	Zero	Weekly
M-10	Pedestrian near misses involving Project vehicles	Incident register	Zero	Immediate and monthly
M-11	Permit to work compliance at the construction and operations interface	Audit record	100 percent	Weekly
M-12	Standing water and vector breeding sites on the works area	Inspection record	Eliminated within 24 hours of identification	Weekly, and after rainfall
M-13	Fish breeding station condition and access	Inspection record	No disturbance, access maintained	Monthly

Ref	Indicator	Method	Target	Frequency
M-14	Coastal water quality at the outfall and downstream of the sluice	Sampling and laboratory analysis	Within the applicable standard	Monthly during construction
M-15	Grievances received, resolved and outstanding	Grievance register	90 percent closed within target time	Monthly
M-16	Workforce composition and local content	Human resources record, disaggregated by sex	Against the Labor Management Plan commitments	Monthly
M-17	Workers' Camp sanitary discharge interface with the SCSTP: receiving manhole/connection condition; surcharge, backflow, seepage or abnormal odor events; confirmation that no construction process water enters the foul system.	Inspection record and incident/interface register.	Zero overflow, backflow or leakage attributable to the camp connection; zero process-water discharges to the foul system.	Weekly, after heavy rainfall or any network surcharge, and immediate on incident.

8.5.3. Verification, Baselines and Monitoring Records

The indicator register above states what is measured, by what method, against what target and how often. This subsection supplies the three elements the register does not carry and which the auditability requirements call for: the measured baseline or the standard each indicator is judged against, a verifying party held separately from the party taking the measurement, and the record the measurement produces. It is organized by monitored subject and not by indicator reference, because several register entries bear on one subject, and the entries below are read together with the register and never in place of it.

The monitoring program is stated once, across all pathways and all management plans, so that the measurement obligations of the Project can be read in one place and reconciled against the resources needed to meet them. Each row carries the indicator, the value or standard it is judged against, the method with its location and frequency, the party measuring and the separate party verifying, and the record the measurement produces. Where the baseline column records that no measurement exists, the baseline is established by the closing action identified at Information Gaps and Assumptions before the indicator carries weight, and the finding depending on it is qualified until then.

Table 197 presents the consolidated environmental and social monitoring program.

Table* 197*: Consolidated environmental and social monitoring program

Indicator	Baseline or standard	Method, location and frequency	Measured by, verified by	Verification record
Treated effluent quality at the plant outlet	Current discharge exceeds the applicable limits, as recorded in the discharge history. Post-upgrade standard set by the treatment specification	Composite sampling at the plant outlet with accredited laboratory analysis. Weekly through commissioning, monthly in steady operation	Contractor process operator; verified by the Barbados Water Authority	Certificate of analysis with chain of custody; effluent quality log
Reclaimed water quality at the facility outlet and at each point of use within the works	Design standard set in the facility description. The applicable national standard is confirmed under the gate conditions before commissioning	Sampling at the facility outlet and at each point of use falling within the works. Daily for operational parameters, monthly for the full parameter suite	Contractor process operator; verified by the Barbados Water Authority with the Environmental Protection Department	Certificate of analysis; reclaimed water quality log; non-conforming batch record
Emergency bypass activation at the existing plant	The 2005 event released between three and six million gallons of preliminary treated sewage that reached the Sanctuary lake	Event recording at the bypass capturing start and end time, estimated volume, destination and cause. Every activation, recorded within 24 hours	Contractor plant operator; verified by the Project Execution Unit	Bypass activation record; incident report; notification record to the Environmental Protection Department
Stormwater discharge quality at the southeast outfall	No measurement exists at the outfall. Established before discharge begins	Grab sampling at the outfall for suspended solids, turbidity, oil and grease and pH. Monthly in the dry season, and after each rainfall event exceeding the design trigger in the wet season	Contractor environmental officer; verified by AECOM as Contract Administrator	Outfall sampling record; certificate of analysis
Integrity of erosion and sediment controls on the route to the southeast gully	Controls installed and inspected before any ground disturbance, under the gate conditions	Visual inspection of silt fences, sediment traps, stabilized surfaces and the outfall apron. Weekly, and within 24 hours after any rainfall event	Contractor environmental officer; verified by AECOM	Erosion and sediment control inspection checklist

Indicator	Baseline or standard	Method, location and frequency	Measured by, verified by	Verification record
Groundwater quality beneath the site	No groundwater baseline exists. Monitoring wells installed and sampled at points agreed with the Barbados Water Authority under the gate conditions	Sampling at the agreed monitoring wells. Quarterly once the wells are installed, and before any recharge commences	Contractor; verified by the Barbados Water Authority	Groundwater monitoring report; well sampling record
Ambient noise at the nearest residential receptors	Location 3 at Harmony Hall measured 56.3 to 60.5 dB(A) daytime, at or above the 55 dB(A) daytime guideline before Project activity. No night-time baseline exists	Calibrated sound level meter at the Harmony Hall receptors, daytime and night-time. Monthly, and within 48 hours of any noise grievance	Contractor Health, Safety and Environment Officer; verified by the Project Execution Unit	Noise monitoring record; grievance response record
Occupational noise exposure	85 dB(A) over an 8-hour time-weighted average	Personal dosimetry in high-noise work areas. Monthly, and on any change of plant or working method	Contractor Health, Safety and Environment Officer; verified by the Contractor Health, Safety and Environment Manager	Occupational noise exposure record; hearing protection issue register
Particulate concentrations at the site boundary nearest the residential receptors	Location 1 recorded 24.64 micrograms per cubic meter of PM2.5 and 59.61 micrograms per cubic meter of PM10 over 12 hours. Full 24-hour measurement is outstanding	Fixed or portable monitor at the boundary nearest the receptors. Continuous during earthworks and demolition, monthly thereafter	Contractor environmental officer; verified by AECOM	Air quality monitoring record; dust suppression log

Indicator	Baseline or standard	Method, location and frequency	Measured by, verified by	Verification record
Carbon monoxide at monitoring Locations 1 and 5	Readings of 117.8 and 141.9 milligrams per cubic meter against the World Health Organization 15-minute guideline of 100 milligrams per cubic meter. Attribution between an inherited exceedance and a Project contribution is unresolved	Repeat measurement with a source investigation. Before mobilization, then quarterly	Contractor environmental officer; verified by the Environmental Protection Department	Air quality monitoring record with source investigation note
Hydrogen sulfide at the site boundary and the nearest community receptor	Baseline 0.018 to 0.04 parts per million	Continuous monitoring with an alarm set at the action level. Continuous, with alarm events recorded as they occur	Contractor process operator; verified by the Project Execution Unit	Hydrogen sulfide monitoring log; alarm event record; community notification record
Odor and nuisance grievances	None recorded at the date of this assessment	Grievance register classified by type and by originating activity. Continuous receipt, reviewed monthly	Community Liaison Officer; verified by the Project Execution Unit Social Management Specialist	Grievance register extract; case file
Vehicle speed on the shared residential access route	15 kilometers per hour on the community access route and 10 kilometers per hour at gate and internal areas	Spot speed checks at the residential section and at the school approach, with vehicle telematics where fitted. Weekly	Contractor Site Supervisor; verified by the Project Execution Unit	Traffic compliance check sheet; driver disciplinary record
Heavy vehicle movements within school-sensitive transit windows	No heavy vehicle movement is permitted within the windows set by the Traffic and Pedestrian Management Plan	Movement log reconciled against the window schedule. Logged daily, reconciled weekly	Contractor Site Supervisor; verified by AECOM	Vehicle movement log; window reconciliation sheet

Indicator	Baseline or standard	Method, location and frequency	Measured by, verified by	Verification record
Mosquito breeding sites on site and within the 50-meter perimeter	Inspection regime established before site occupation	Inspection for standing water, open containers and tires, with a larval survey. Weekly, and after each rainfall event during trenching and excavation	Contractor Health, Safety and Environment Officer with the Camp Manager; coordinated with the Ministry of Health and Wellness	Vector control inspection record; larval survey sheet
Illness presentations among the workforce	Health record established at occupation. Three or more epidemiologically linked cases of the same illness within seven days constitutes a suspected outbreak	Recording of presentations per 100 occupants, with syndromic grouping. Weekly	Camp medical staff; verified by the Contractor Health, Safety and Environment Manager	Camp health record; outbreak notification record
Sludge quantity removed and dried solids content	1.8 metric tons per day of dry solids under average loading and 2.6 metric tons per day under maximum loading, dried to 75 percent solids content	Calibrated measurement at removal with solids testing on each consignment. Every consignment	Contractor process operator; verified by AECOM	Waste manifest; sludge removal record; solids test certificate
Integrity of hazardous material and chemical storage	Secondary containment at not less than 110 percent of container capacity, with incompatible reagents segregated. Sodium acetate is dosed at up to 4,715 kilograms per day and stored as a 25 percent solution	Inspection of bunding, labeling, segregation, ventilation and spill kit availability at each storage area. Weekly	Contractor Health, Safety and Environment Officer; verified by AECOM	Hazardous materials inspection checklist; chemical inventory and safety data sheet register

Indicator	Baseline or standard	Method, location and frequency	Measured by, verified by	Verification record
Waste consignments transferred off site	A manifest is required for every off-site transfer, signed by the generator, the transporter and the receiving facility. Collection at least weekly	Reconciliation of the waste log against manifests and receiving facility receipts. Monthly	Contractor environmental officer; verified by the Project Execution Unit	Waste log; waste manifests; receiving facility receipts
Grievances handled within the published service standards	Acknowledgment within two working days (24 hours for urgent cases; immediately for SH/SEA/GBV), simple cases resolved within seven working days, cases escalated to the Grievance Redress Committee resolved within 14 days, as set in Section 8.4.12	Grievance register with a timestamp at each step, and a closure record. Monthly	Community Liaison Officer; verified by the Project Execution Unit Social Management Specialist	Grievance register; case files; closure records
Reports of sexual exploitation and abuse, sexual harassment and gender-based violence	Zero tolerance, with survivor-centered and confidential handling and no retaliation	Confidential channels independent of line management and of the campsite, with a case register held separately from the general grievance register. Immediately on receipt, reviewed monthly	Contractor social personnel with the Supervisory Consultant; verified by the Project Execution Unit Social Management Specialist	Confidential case register; referral record; survivor support record

Indicator	Baseline or standard	Method, location and frequency	Measured by, verified by	Verification record
Workforce composition and local content	252 planned posts, of which 21 are held by women at 8.3 percent, and 154 posts at 61.1 percent sit in roles employing no women. Local content declines from about 79 percent at mobilization to about 47 percent at peak construction	Payroll and contractor employment register disaggregated by sex, nationality, disability and vulnerability status. Monthly	Contractor Human Resources; verified by the Project Execution Unit	Workforce register extract; recruitment record
Code of Conduct induction coverage	Every worker, subcontractor employee and supplier representative before first entry to site	Induction register reconciled against the site access register. Monthly	Contractor Health, Safety and Environment and Human Resources; verified by AECOM	Induction register; signed acknowledgment of the Code of Conduct
Gate conditions satisfied before the activity each governs	The twenty-three pre-construction and pre-operational gate conditions	Documentary verification against each condition before the governed activity begins, and again on any material change to design or method	Contractor; verified by the party named against each gate condition	Gate condition close-out record

How to read this table. Each row is one measurement obligation. The first column names what is measured. The second says what it is compared against, which is either a measured starting value or a standard. The third says how, where and how often. The fourth names two different parties, one to take the measurement and one to confirm it, which is the arrangement that makes the result capable of audit. The fifth names the piece of paper or the electronic record an auditor asks to see. Where the second column states that no measurement exists, that gap is already recorded at Information Gaps and Assumptions together with the action that closes it, and the indicator carries full weight only once that action is complete.

8.5.4. Action Thresholds and Corrective Action Triggers

A monitoring program that records values without stating what value is unacceptable does not control anything. This subsection states, for each measured parameter, the level at which the Project treats performance as drifting and increases attention, and the level at which performance is treated as a failure and a defined corrective action follows. The two levels are distinguished because the purpose of an alert level is to allow the activity to be corrected before a limit is reached, and the purpose of an action level is to stop the activity causing the exceedance.

Three rules apply across every row. An action level reached is recorded as a non-conformance, whether or not the exceedance is corrected quickly. A corrective action is not closed by the party that caused the exceedance, and closure requires the verifying party named in the monitoring program. And repeated alert-level results, meaning three consecutive measurements of the same indicator at or above the alert level, are treated as an action-level result even where no single measurement reaches the action level, because a sustained drift and a single exceedance carry the same consequence for the receptor.

Table 198 presents the action thresholds, corrective action triggers and escalation.

Table** 198**: Action thresholds, corrective action triggers and escalation

Parameter	Alert level	Action level	Corrective action on reaching the action level	Escalation
Treated effluent quality at the plant outlet	Any parameter at 80 percent of its limit value	Any parameter exceeding its limit value, or two consecutive results above the alert level	Investigate the process cause, adjust dosing or loading, resample within 24 hours, and suspend any activity contributing to the exceedance	Barbados Water Authority and the Environmental Protection Department notified within 24 hours
Reclaimed water quality at the facility outlet	Any parameter at 80 percent of the design standard	Any parameter outside the design standard	Divert the non-conforming batch, hold it from any point of use, investigate and resample before release, and record the batch as non-conforming	Barbados Water Authority notified within 24 hours; the Bank notified in the next periodic report
Emergency bypass activation	Any condition reducing redundancy in the plant, such as a unit out of service or a pump unavailable	Any activation of the bypass, of any duration	Implement the Sewage Spill Response Protocol, stop the contributing activity, record volume and destination, and undertake downstream sampling at the wetland interface	Environmental Protection Department, Barbados Water Authority and the Project Execution Unit notified immediately; reported to the Bank as a significant incident
Stormwater discharge at the southeast outfall	Visible turbidity at the outfall, or suspended solids at 80 percent of the adopted limit	Suspended solids above the adopted limit, or any visible oil or chemical sheen	Stop the contributing earthworks, install or repair controls before resuming, clean the outfall apron and resample	AECOM and the Project Execution Unit notified within 24 hours; the Environmental Protection Department notified where the discharge reaches the wetland drainage system

Parameter	Alert level	Action level	Corrective action on reaching the action level	Escalation
Erosion and sediment control integrity	Any control found damaged, undercut or at more than half its sediment capacity	Any control found bypassed or failed, or sediment observed beyond the control line	Stop ground disturbance in the contributing area, reinstate the control, recover deposited sediment and record the cause	AECOM notified within 24 hours
Groundwater quality	Any parameter showing a consistent trend toward its standard across two consecutive rounds	Any parameter exceeding its standard, or any detection of a Project-associated chemical not present in the baseline	Suspend the activity capable of causing the result, resample with a duplicate, and investigate the source	Barbados Water Authority notified within 48 hours; recharge suspended until resolved
Ambient noise at residential receptors	53 dB(A) daytime or 43 dB(A) at night at the receptor	55 dB(A) daytime or 45 dB(A) at night at the receptor	Identify and stop or reschedule the contributing activity, apply screening or a quieter method, and remeasure after correction to verify compliance	Project Execution Unit notified within 48 hours; repeated exceedance reported to the Bank in the next periodic report
Occupational noise exposure	80 dB(A) over an 8-hour time-weighted average	85 dB(A) over an 8-hour time-weighted average	Issue and enforce hearing protection, rotate workers out of the exposure, apply engineering control at the source, and re-measure	Contractor Health, Safety and Environment Manager; reported in the monthly performance report
Particulate concentrations at the boundary	PM10 at 80 percent of the adopted 24-hour limit, or visible dust crossing the boundary	PM10 above the adopted 24-hour limit, or visible dust reaching a residential receptor	Increase suppression, stop the contributing activity in high wind, cover stockpiles and haul loads, and notify affected residents	AECOM notified within 24 hours; Environmental Protection Department notified on a sustained exceedance
Carbon monoxide at Locations 1 and 5	80 milligrams per cubic meter over 15 minutes	100 milligrams per cubic meter over 15 minutes, being the World Health Organization 15-minute guideline	Investigate the source, stop or relocate any contributing Project plant, and where the source is not attributable to the Project record the attribution and notify the authority	Environmental Protection Department notified within 48 hours

Parameter	Alert level	Action level	Corrective action on reaching the action level	Escalation
Hydrogen sulfide at the boundary and the nearest community receptor	0.05 parts per million as a 30-minute mean	0.1 parts per million as a 30-minute mean, or any odor complaint corroborated by measurement	Identify and isolate the source, verify odor control operation, and notify the affected receptors with the expected duration	Project Execution Unit notified immediately; Environmental Protection Department notified on a sustained exceedance
Grievance handling	Any case approaching its service standard with two working days remaining	Any case exceeding a service standard, or any case open beyond 30 working days without a recorded reason	Escalate the case to the Project Execution Unit Social Management Specialist, record the cause of delay, and contact the complainant with a revised date	Reported in the monthly performance report with the number of cases out of standard
Vehicle speed and movement discipline	Any single recorded exceedance of the posted limit	Any exceedance above the posted limit by more than 5 kilometers per hour, any movement within a school-sensitive window, or any second exceedance by the same driver	Remove the driver from the route pending retraining, apply the disciplinary provisions of the Code of Conduct, and review the movement schedule	AECOM and the Project Execution Unit notified within 24 hours; any injury collision reported as a significant incident
Mosquito breeding	Any standing water found that is capable of supporting breeding	Any positive larval finding, or a second consecutive inspection identifying standing water at the same location	Eliminate the breeding site, treat the area, re-inspect within 48 hours, and review the site drainage and housekeeping arrangements at that location	Ministry of Health and Wellness coordination; reported in the monthly performance report
Workforce illness	Any single case of a notifiable or communicable illness	Three or more epidemiologically linked cases of the same illness within seven days	Isolate affected persons, implement outbreak measures, suspend shared catering or facilities where implicated, and notify the health authority	Ministry of Health and Wellness notified immediately; reported to the Bank as a significant incident where community transmission is credible

Parameter	Alert level	Action level	Corrective action on reaching the action level	Escalation
Hazardous material and chemical storage	Any labeling, inventory or housekeeping deficiency, or a spill kit found incomplete	Any loss of containment, any incompatible reagents stored together, or any secondary containment below 110 percent of capacity	Contain and recover the release, segregate the reagents, restore containment before storage resumes, and investigate the cause	AECOM notified within 24 hours; any release reaching ground or drainage reported as a significant incident
Sexual exploitation and abuse, sexual harassment and gender-based violence	Not applied. Every report is treated as an action-level matter	Any report, allegation or disclosure, of any kind	Apply the survivor-centered response in the prevention and response plan, separate the parties, refer to support services with consent, and investigate without disclosing identity	Project Execution Unit Social Management Specialist notified immediately; reported to the Bank in accordance with its incident reporting requirements
Code of Conduct induction coverage	Any person recorded on site without a completed induction	Any person working on site without a completed induction, or coverage below 100 percent at a monthly reconciliation	Remove the person from site until inducted, investigate the access control failure, and re-reconcile the registers	AECOM notified at the monthly reconciliation
Gate conditions	Any gate condition within 30 days of its governed activity and not yet verified	Commencement of any governed activity before its gate condition is verified and closed out	Stop the activity, close out the condition, and record the departure as a non-conformance	Project Execution Unit notified immediately; reported to the Bank as a non-conformance

How to read this table. The second column is a warning level, reached while performance is still acceptable, and the response to it is closer attention and an adjustment to method. The third column is the point at which performance is unacceptable. Reaching it has three consequences in every case: the activity causing the result is stopped or changed, the matter is recorded as a non-conformance, and a party other than the one that caused it decides when the matter is closed. The fourth column states the action and the fifth states who must be told and how quickly. A reader who wants to know what happens when something goes wrong can read a single row across and obtain the complete answer.

8.5.5. Verification Records and Field Monitoring Templates

A measurement that leaves no record cannot be verified after the event. This subsection registers the records the monitoring program produces, states who creates each one and who holds it, states how

long it is retained, and states which parties may call for it. The templates for the field records are reproduced in the management plans in this chapter, which carry the waste manifest, the corrective action log, the incident notification form, the case closure sign-off and the outstanding issues register. Those forms are the field instruments of this monitoring program, and each is completed in full at the time of the measurement.

Three conventions apply to every record. Each entry carries the date, the location, the identity of the person making it and, where an instrument is used, the instrument identification and the date of its last calibration, because a result from an uncalibrated instrument is not evidence. Records are not altered after the fact, and a correction is entered as a dated addition that leaves the original legible. And records are held in a single register indexed by date and by indicator, so that an auditor selecting a date can retrieve every record generated on it without relying on the Contractor to assemble a selection.

Table 199 presents the verification record register, retention and access.

Table 199***: Verification record register, retention and access***

Record	Created by	Held by	Retention	Available to
Certificates of analysis with chain of custody, for effluent, reclaimed water, stormwater and groundwater	Accredited laboratory, on instruction of the Contractor	Contractor, with copies to the Barbados Water Authority	Life of the Project and five years after the operation assistance period ends on 14 May 2032	Barbados Water Authority, Environmental Protection Department, AECOM, Project Execution Unit, the Bank and its auditors
Bypass activation records and spill incident reports	Contractor plant operator and Health, Safety and Environment Manager	Contractor, with copies to the Project Execution Unit on each occurrence	Permanent	Environmental Protection Department, Barbados Water Authority, Project Execution Unit, the Bank and its auditors
Erosion, sediment and stormwater inspection checklists	Contractor environmental officer	Contractor	Life of the construction period and three years after completion	AECOM, Project Execution Unit, the Bank and its auditors
Noise monitoring records and occupational noise exposure records	Contractor Health, Safety and Environment Officer	Contractor, with occupational records held in the worker health file	Occupational exposure records for the duration of employment and thirty years thereafter; ambient records for the life of the Project	Project Execution Unit, the Bank and its auditors; occupational records to the worker concerned and the Labour Department

Record	Created by	Held by	Retention	Available to
Air quality monitoring records and dust suppression logs	Contractor environmental officer	Contractor	Life of the Project and three years thereafter	AECOM, Environmental Protection Department, Project Execution Unit, the Bank and its auditors
Hydrogen sulfide monitoring logs, alarm event records and community notification records	Contractor process operator and Community Liaison Officer	Contractor	Life of the Project	Project Execution Unit, Environmental Protection Department, the Bank and its auditors
Waste logs, waste manifests and receiving facility receipts	Contractor environmental officer, signed by generator, transporter and receiving facility	Contractor, with manifests retained in sequence	Life of the Project and five years thereafter	Environmental Protection Department, AECOM, Project Execution Unit, the Bank and its auditors
Sludge removal records and solids test certificates	Contractor process operator	Contractor	Life of the Project and five years thereafter	AECOM, Environmental Protection Department, Project Execution Unit
Hazardous materials inspection checklists, chemical inventory and safety data sheet register	Contractor Health, Safety and Environment Officer	Contractor, with the register available at each storage area	Life of the Project	AECOM, Project Execution Unit, emergency services on request, the Bank and its auditors
Vehicle movement logs, transit window reconciliation sheets and traffic compliance check sheets	Contractor Site Supervisor	Contractor	Life of the construction period and three years thereafter	AECOM, Project Execution Unit, the Bank and its auditors
Vector control inspection records and larval survey sheets	Contractor Health, Safety and Environment Officer with the Camp Manager	Contractor, shared with the Ministry of Health and Wellness	Life of the Project	Ministry of Health and Wellness, Project Execution Unit, the Bank and its auditors

Record	Created by	Held by	Retention	Available to
Health records, illness presentation records and outbreak notifications	Camp medical staff	Contractor, held confidentially and separately from personnel files	Duration of employment and ten years thereafter	Ministry of Health and Wellness and the worker concerned; aggregated and de-identified data to the Project Execution Unit and the Bank
Grievance register, case files and closure records	Community Liaison Officer	Contractor, with a parallel register held by the Project Execution Unit	Life of the Project and five years thereafter	Project Execution Unit, the Bank and its auditors; the complainant in respect of their own case
Confidential case register for sexual exploitation and abuse, sexual harassment and gender-based violence, with referral and support records	Designated trained focal point, independent of line management	Held confidentially and separately, access restricted to named persons	Life of the Project and ten years thereafter	Named persons only. Aggregated and de-identified data to the Project Execution Unit and the Bank. No access that could identify a survivor
Workforce register extracts, recruitment records and induction registers	Contractor Human Resources and Health, Safety and Environment	Contractor, with monthly extracts to the Project Execution Unit	Duration of employment and five years thereafter	Project Execution Unit, Labour Department, the Bank and its auditors
Gate condition close-out records	Contractor, countersigned by the verifying party named against the condition	Project Execution Unit, as the holder of the gate register	Permanent	All parties, the Bank and its auditors
Non-conformance register, corrective action logs and outstanding issues registers	Contractor Health, Safety and Environment Manager	Contractor, with the register visible to the Project Execution Unit at all times	Permanent	AECOM, Project Execution Unit, the Bank and its auditors
Training, toolbox talk and drill records, including emergency drills	Contractor Health, Safety and Environment Officer	Contractor	Life of the Project and three years thereafter	AECOM, Project Execution Unit, the Bank and its auditors

Record	Created by	Held by	Retention	Available to
Consultation records, attendance registers and feedback logs from town halls and community meetings	SAEDI Consulting with the Community Liaison Officer	Project Execution Unit, as the holder of the consultation record	Permanent	All parties, the Bank, and the public in respect of disclosed material

How to read this table. Each row is one kind of record. The first column names it, the second says who writes it, and the third says who keeps it. The fourth column states how long it must be kept, which is longer for records that may be needed after the Project ends, such as occupational health records and permanent registers. The fifth column states who can ask to see it. The entries for health records and for reports of sexual exploitation, abuse, harassment and gender-based violence are deliberately narrower than the others, because access to those records is restricted to protect the people they concern, and the parties overseeing the Project receive aggregated figures from which no individual can be identified.

8.5.6. Internal and External Reporting

Reporting converts the records into information that the parties overseeing the Project can act on. This subsection states what is reported, by whom, to whom and at what interval. Internal reporting runs from the Contractor to the Contract Administrator and the Project Execution Unit. External reporting runs from the Project Execution Unit to the Government of Barbados regulators and to the Bank, and in defined cases directly and immediately from the Contractor to a regulator where a statutory notification duty applies.

Two principles govern the content. A report states performance against the indicators and the thresholds in this section, so that the reader can see both what was measured and whether it was acceptable, and it does not substitute a narrative of activity for that statement. And a report discloses every action-level result and every non-conformance in the period, including those already closed, because a record of closed non-conformances is the evidence that the system is working and its absence prevents any such finding.

Table 200 presents the internal and external reporting requirements.

Table** 200**: Internal and external reporting requirements

Report	Content	Prepared by, submitted to	Frequency
Daily site record	Activities undertaken, inspections completed, alert and action-level results, incidents, grievances received, and weather conditions bearing on dust, noise and runoff	Contractor Health, Safety and Environment Officer to the Contractor Project Manager	Daily
Weekly inspection summary	Results of the weekly inspections of erosion and sediment controls, hazardous material storage, traffic compliance and vector control, with open corrective actions	Contractor Health, Safety and Environment Manager to AECOM	Weekly

Report	Content	Prepared by, submitted to	Frequency
Monthly environmental and social performance report	Performance against every indicator in the consolidated monitoring program, every alert and action-level result, the non-conformance register movement, grievance statistics against the service standards, workforce composition and local content, training and induction coverage, consultation undertaken, and the status of open corrective actions and gate conditions	Contractor, through AECOM, to the Project Execution Unit	Monthly, within ten working days of month end
Immediate incident notification	Nature, time, location, cause so far as known, persons affected, immediate action taken, and the containment or control achieved	Contractor to AECOM and the Project Execution Unit, and directly to the relevant regulator where a statutory notification duty applies	Immediately, and in any event within 24 hours
Significant incident report	Full investigation of any bypass activation, release reaching ground or drainage, injury collision, suspected disease outbreak, or report of sexual exploitation, abuse, harassment or gender-based violence, with root cause and corrective action	Contractor to the Project Execution Unit; Project Execution Unit to the Bank	Initial report within 48 hours; full investigation within fifteen working days
Quarterly compliance report to the regulators	Monitoring results for effluent, reclaimed water, stormwater, groundwater, air quality and noise, with exceedances, their causes and the corrective action taken	Project Execution Unit to the Environmental Protection Department, the Barbados Water Authority and, in respect of coastal matters, the Coastal Zone Management Unit	Quarterly
Semi-annual environmental and social compliance report to the Bank	Performance against this Environmental and Social Management Plan, the status of each management plan, the gate condition register, the non-conformance register, grievance performance, consultation undertaken, Critical Habitat monitoring results, and progress against the actions closing the information gaps	Project Execution Unit to the Inter-American Development Bank	Semi-annually

Report	Content	Prepared by, submitted to	Frequency
Annual report on carbon and resource performance	Purchased electricity, on-site standby generation and solar output stated separately, greenhouse gas monitoring results, water reclaimed and reused, sludge produced and its disposal or reuse route, and waste diverted from disposal	Project Execution Unit to the Inter-American Development Bank and the Green Climate Fund	Annually
Annual audit report	Findings of the internal and independent audits, with the status of every finding from previous audits	Independent auditor to the Project Execution Unit; Project Execution Unit to the Bank	Annually
Public disclosure of monitoring performance	A summary of monitoring performance, grievances received and resolved, and upcoming activities affecting the community, in plain language	Project Execution Unit, through the Community Liaison Officer, to the affected communities at town halls and through the disclosure channels in the Stakeholder Engagement Plan	Quarterly, and before any activity materially changing community exposure

How to read this table. The first five rows are internal, running from the people doing the work to the people supervising it, and they become more detailed as the interval lengthens. The next four are external, running to the Barbados regulators and to the financiers, and they report performance against commitments. The last row is reporting back to the community, which closes the loop opened at consultation: residents who raised concerns about noise, dust, traffic and safety receive a plain-language account of how the Project performed against those concerns, at the same interval as the regulators receive theirs.

Three results are disclosed publicly whatever the reporting cycle: reclaimed water quality at the facility outlet and at each point of use, receiving water quality following any discharge or release event, and the grievance register in summary form. Disclosure of the first is a condition of public confidence in the reuse scheme, disclosure of the second is what allows a community to judge the consequence of an event for itself, and disclosure of the third is what demonstrates that concerns raised are being answered.

8.5.7. Plan Review, Update and Corrective Action

This Environmental and Social Management Plan is a controlled document, and it changes when the conditions it was written for change. This subsection states what triggers a review, how an update is made and approved, how a departure from the Plan is recorded and closed, and how the version in force at any date can be identified. Without those provisions the Plan cannot be audited, because an auditor cannot establish which commitments were in force at the time of the matter being examined.

A review of the whole Plan is undertaken annually. A review of the affected part is undertaken on any of the following, within fifteen working days of the event: an action-level monitoring result that the existing measures did not prevent; any significant incident; any change to the design, the construction method

or the program that alters an impact pathway or the exposure of a receptor; completion of any action closing an information gap, where the result changes a baseline value or a residual rating; a change in the applicable legislation, standard or Bank requirement; the confirmation of the reclaimed water destination under Component 2; the finalization of the drainage design following the AECOM review; any material change to the workforce size, composition or accommodation arrangements; and a grievance or consultation finding that identifies a receptor or an effect this assessment did not address.

An update is prepared by the Contractor with SAEDI Consulting, reviewed by AECOM for consistency with the construction contract, and approved by the Project Execution Unit. An update that changes a mitigation measure on which a residual significance rating depends, that removes a gate condition, or that alters a commitment given at consultation, is submitted to the Bank before it takes effect. Every version carries a number, a date of approval and a revision record stating what changed, why it changed and which part of this document it affects. The revision record is cumulative, so that the complete history of the Plan is readable from the current version, and superseded versions are retained for the retention period applying to permanent registers.

A departure from this Plan is recorded in the non-conformance register, whatever its cause and whether or not it was corrected immediately. The register entry states the requirement departed from, the date and duration, the cause established by investigation, the corrective action, the action taken to prevent recurrence, the date of closure and the party that closed it. A corrective action is closed by the verifying party and not by the party that caused the departure. An open corrective action past its target date is reported in every performance report until it is closed, and the number of overdue corrective actions is itself a performance indicator of this Plan.

Table 201 presents the non-conformance classification, response and authority to close.

Table** 201**: Non-conformance classification, response and authority to close

Classification	Definition	Response time	Authority to close
Critical	A departure causing or capable of causing serious harm to a person, an uncontrolled release to confirmed Critical Habitat, a bypass activation, a fatality or serious injury collision, or any report of sexual exploitation, abuse, harassment or gender-based violence	Activity stopped immediately. Investigation begun within 24 hours and completed within fifteen working days	Project Execution Unit, on the recommendation of the independent auditor where the departure concerns Critical Habitat or a report of sexual exploitation, abuse, harassment or gender-based violence
Major	An exceedance of a limit value or an action level, a failure of a control on which a residual rating depends, commencement of an activity before its gate condition is closed, or a repeated minor departure of the same kind	Contributing activity stopped or modified within 24 hours. Corrective action completed within ten working days	Project Execution Unit, on verification by AECOM

Classification	Definition	Response time	Authority to close
Minor	A departure from a procedural or administrative requirement with no exceedance and no exposure of a receptor, such as an incomplete record, a missed inspection or an overdue calibration	Corrective action completed within twenty working days	AECOM, with the closure reported to the Project Execution Unit
Observation	A condition that complies with the requirement but is capable of leading to a departure if unaddressed, including any alert-level result	Addressed within the reporting period in which it arises	Contractor Health, Safety and Environment Manager, with the record available to AECOM

How to read this table. The four classifications set the urgency of the response and decide who may declare the matter resolved. The more serious the departure, the faster the response and the more senior and more independent the party that closes it. The arrangement means that no party can close a serious finding against itself. Observations are included because a condition that has not yet caused an exceedance is the cheapest point at which to intervene, and recording them produces the record that shows whether warnings were acted on.

8.5.8. Audit and Assurance

Audit is the test of whether the monitoring, recording, reporting and corrective action provisions in this section are operating as written. It is distinct from monitoring. Monitoring measures the environment and the workforce; audit examines the system that produces those measurements and the records that evidence them. Four levels of audit apply, and each produces a written output with findings classified on the scale set out above.

Every audit tests the same three things, whatever its scope. Whether the measurements required by this section were taken, at the stated frequency, by the stated party, using calibrated instruments. Whether the records exist, are complete, are contemporaneous and are retrievable without assistance from the party being audited. And whether the thresholds were applied, meaning that action-level results were recorded as non-conformances and closed by the correct authority. An audit that reports compliance without having sampled records against those three tests does not satisfy this requirement.

Table 202 presents the audit and assurance arrangements.

Table** 202**: Audit and assurance arrangements

Audit	Scope	Conducted by	Frequency	Output
Contractor internal audit	All provisions of this Plan applying to the Contractor, sampled across indicators, records and corrective actions	Contractor Health, Safety and Environment Manager, with auditors independent of the area audited	Quarterly, with each management plan covered at least annually	Internal audit report with classified findings and a corrective action log

Audit	Scope	Conducted by	Frequency	Output
Contract Administrator surveillance	Compliance of the works with the environmental and social requirements of the construction contract, with verification of the records supporting the monthly performance report	AECOM as Contract Administrator	Monthly, with record sampling at each visit	Surveillance record appended to the monthly performance report, with any findings entered in the non-conformance register
Project Execution Unit compliance review	Performance of this Plan as a whole, including the gate condition register, grievance performance against the service standards, consultation commitments, and the adequacy of the Contractor internal audit	Barbados Water Authority Project Execution Unit, environmental and social specialists	Semi-annually, aligned with the reporting cycle to the Bank	Compliance review report forming part of the semi-annual report to the Bank
Independent audit	The full Plan, including Critical Habitat safeguards and monitoring, the confidential handling of reports of sexual exploitation, abuse, harassment and gender-based violence, labor and working conditions, and the integrity of the record system	A party independent of the Contractor, the Contract Administrator and the Project Execution Unit, appointed by the Project Execution Unit	Annually, and before the end of the operation assistance period on 14 May 2032	Independent audit report submitted to the Project Execution Unit and the Bank, with findings tracked to closure

How to read this table. The four rows run from the party doing the work outward to a party with no interest in the result. The Contractor checks itself quarterly, the Contract Administrator checks the Contractor monthly, the Project Execution Unit checks the whole arrangement twice a year, and an independent party checks all of it once a year. Each level examines the level below it, including whether that level's own auditing is adequate, so a weakness in self-assessment is itself a finding. The last column names the document each audit produces, and those documents are the evidence that this Plan was implemented and not merely issued.

Findings from any audit are entered in the non-conformance register under the classification scheme above and are tracked to closure in the same way as findings arising from monitoring. A finding is not closed on the strength of an undertaking to act. It is closed on evidence that the action was taken and that the condition it addressed has been verified as corrected, and the evidence relied on is identified in the register entry.

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Annexes

The annexes reproduced below are extracted from the Rapid Critical Habitat Assessment prepared for this Project. They are included in full so that the evidence supporting the biodiversity and critical habitat assessment sits alongside it. Annexes A and B set out the evidence base and the species screening. Annex C records the field verification undertaken on 21, 24 and 28 August 2026. Annexes D, E and F carry the determination, the impact and significance assessment and the mitigation and monitoring requirements. Annex G is the photographic record of the field verification.

Annex A. Biodiversity Evidence Register

Rapid Critical Habitat Assessment

Biodiversity Evidence Register

Table 203 presents the biodiversity evidence register.

Table** 203**: Biodiversity evidence register

REF.	SOURCE	DATE	INFORMATION EXTRACTED	SPATIAL RELEVANCE	CHA CRITERION SUPPORTED	RELIABILITY	GAP/LIMITATION
R1	**BA-L1063 – Barbados Climate Resilient South Coast Water Reclamation Plant – ESIA, ESMP and ESMS**	**2024**	Principal project-specific environmental assessment. Provides project description and footprint; Graeme Hall wetland context; habitats including mangrove, freshwater/brackish wetland, grassland, shrubland, woodland and sedge communities; flora/fauna and January 2024 avifaunal observations; groundwater/hydrology and water quality; Worthing/South Coast marine environment including coral reef and seagrass; species of conservation concern; project activities and potential impact pathways; cumulative impacts; and existing biodiversity/water-quality mitigation, monitoring and management measures.	**Very High** – project footprint, SCSTP/new facility, immediately adjacent Graeme Hall Swamp and potentially connected drainage/coastal/ marine receiving environment.	**A – Existing or Proposed Protected Area / Internationally Recognized Site:** supports Ramsar and conservation context. **B – Area Necessary to Maintain a Protected Area:** supports hydrology, drainage, groundwater and wetland–coastal connectivity assessment. **C – Habitat Crucial for CR/EN/VU/NT Species:** supports screening of threatened flora/fauna and marine taxa. **D – Endemic/Range-Restricted Species:** supports screening of endemic/restricted-range fauna. **E – Migratory Species/Routes or Congregations:** supports avifaunal and migratory-use screening. **F – Habitat Highly Suitable for Biodiversity Conservation:** supports assessment of mangrove, wetland, seagrass, reef, ecological processes and ecosystem condition.	**High** for project description, infrastructure and proposed mitigation/management; **Medium–High** for biodiversity baseline.	Some biodiversity information is secondary and derived from earlier studies. January 2024 observations provide useful recent evidence but limited temporal/seasonal coverage. Species status and occurrence require verification against current sources. Marine receptors require pathway screening to determine their relationship to the CHA assessment area.
R2	**NEMUS – Final ESMP, South Coast: R's for Climate Resilience**	**2021**	Consolidates earlier ecological studies and project impact assessment. Identifies Graeme Hall Swamp as a principal ecological receptor and degraded wetland requiring ecological recovery. Uses December 2018 EEC work as an ecological baseline and	**Very High** – project site, Graeme Hall Swamp, Nature Sanctuary, Bisecting Canal, ponds and connected Worthing/coastal	**B – Area Necessary to Maintain a Protected Area: strong evidence** on hydrology, salinity and swamp–sea connectivity. **C – Habitat Crucial for CR/EN/VU/NT Species:** supporting where relevant species are identified in underlying studies. **D – Endemic/Range-Restricted Species:** supporting where applicable. **E – Migratory**	**High** for project risks, mitigation and monitoring framework; **Medium–High** for ecological baseline.	Much biodiversity evidence derives from 2018/2019 and earlier studies. Ecological baseline was geographically limited in places, particularly to the Nature Sanctuary. Historic sampling

REF.	SOURCE	DATE	INFORMATION EXTRACTED	SPATIAL RELEVANCE	CHA CRITERION SUPPORTED	RELIABILITY	GAP/LIMITATION
	Wastewater System in Barbados Preparation Project		identifies **fish community and mangrove habitat as ecological-status indicators**. Establishes detailed wetland water-quality parameters and repeat sampling locations. Addresses swamp–sea salinity/connectivity, rehabilitation objectives and Little Egret breeding/dispersal considerations. Identifies project pathways including pollution, vegetation clearance, fauna disturbance, turbidity/TSS, marine habitat damage and effects on coral/seagrass.	environment.	**Species/Routes or Congregations:** supporting evidence through Little Egret breeding/dispersal and wetland bird use. **F – Habitat Highly Suitable for Biodiversity Conservation:** strong evidence through mangrove/wetland condition, ecological recovery needs and fish/mangrove indicators.		methods were not always comparable. Prior ESIA significance ratings are not KBF-specific and should not automatically be adopted by the CHA.
R3	**Ramsar Sites Information Service – Annotated List / Ramsar Information for Graeme Hall Swamp, Site No. 1591**	**Designated 2005; most recent RIS information 2005**	Confirms Graeme Hall Swamp as a **33-ha Wetland of International Importance**. Describes a naturally created coastal wetland comprising mangrove forest, seagrass bed, shallow nearshore coral reef and a 12-acre artificial lake. Records at least 84 bird species, Red and White mangrove stands described as the largest healthy mangrove areas remaining in Barbados, and more than 20 freshwater/brackish-water fish species, including marine species isolated from the sea	**Very High** – directly describes Graeme Hall Swamp and its ecological components; also relevant to wetland–coastal/marine connectivity.	**A – Existing or Proposed Protected Area / Internationally Recognized Site: direct/strong evidence** through Ramsar designation. **B – Area Necessary to Maintain a Protected Area:** supporting evidence through linked wetland, seagrass and reef components and ecological connectivity. **C – Habitat Crucial for CR/EN/VU/NT Species:** supporting species evidence requiring current status verification. **E – Migratory Species/Routes or Congregations:** strong evidence through bird diversity and wetland use. **F – Habitat Highly Suitable for Biodiversity Conservation:** strong evidence through national rarity	**High** for Ramsar designation, site area and stated ecological character at designation.	Ecological information is approximately 20 years old. Does not establish current species abundance, habitat condition or CHA thresholds. Species records and ecological character require comparison with more recent evidence.

REF.	SOURCE	DATE	INFORMATION EXTRACTED	SPATIAL RELEVANCE	CHA CRITERION SUPPORTED	RELIABILITY	GAP/LIMITATION
			that became breeding residents of the lake. Also records historical water-quality and invasive tilapia concerns.		and ecological character of mangrove/wetland habitats.		
R4	**Government of Barbados – National Biodiversity Strategy and Action Plan (NBSAP)**	**2020**	Provides national biodiversity status, trends, conservation priorities and threats. Confirms Graeme Hall as Barbados' sole Ramsar Site and identifies it as a rest stop for migratory birds on the **North American flyway**. Records national importance of coral reefs, mangroves, seagrasses and marine turtles; recognizes pollution, excess nutrients, habitat loss and invasive species as biodiversity pressures. Provides national context for endemic and restricted-range biodiversity and acknowledges biodiversity monitoring/data gaps.	**Medium–High overall; High for national conservation context** and Graeme Hall migratory-bird/Ramsar recognition.	**A – Existing or Proposed Protected Area / Internationally Recognized Site:** supporting national confirmation of Ramsar/conservation recognition. **C – Habitat Crucial for CR/EN/VU/NT Species:** supporting national context for threatened species. **D – Endemic/Range-Restricted Species:** supporting national context. **E – Migratory Species/Routes or Congregations:** strong contextual evidence through flyway/rest-stop function. **F – Habitat Highly Suitable for Biodiversity Conservation:** supporting evidence through national conservation significance of wetland, mangrove, seagrass and coral ecosystems.	**High** for national policy, conservation priorities and national biodiversity context.	Primarily national-scale. Does not establish project-area occurrence, population thresholds or current abundance for most species. Some underlying biodiversity information predates 2020. Current IUCN status must be independently verified.
R5	**Mahon, R., Warren, S., Wood, J. & Yarde, T. – Barbados National Wetland Inventory**	**2023**	Dedicated Graeme Hall assessment covering wetland setting, hydrology/water regime, water chemistry, habitats, biota, changes in ecological character, ecosystem services, pressures, conservation status and monitoring. Maps Graeme Hall habitats and documents open-water areas, canals, woodland	**Very High** – dedicated assessment of Graeme Hall and its constituent habitats and ecological processes.	**A – Existing or Proposed Protected Area / Internationally Recognized Site:** strong evidence through Ramsar and national wetland recognition. **B – Area Necessary to Maintain a Protected Area:** strong evidence through hydrology, water regime, sea connection and wetland ecological processes. **C – Habitat Crucial for CR/EN/VU/NT Species:** supporting where threatened species are identified. **D –**	**High** – recent national wetland inventory incorporating literature review, spatial/GIS work and field/ground-truthing approaches.	Publication date does not represent the observation date of all underlying evidence. Several water-quality, fish, bird and ecological-condition findings derive from older studies. Does not provide comprehensive contemporary

REF.	SOURCE	DATE	INFORMATION EXTRACTED	SPATIAL RELEVANCE	CHA CRITERION SUPPORTED	RELIABILITY	GAP/LIMITATION
			and wetland vegetation. Records 33 documented flora species and historical mangrove diversity. Documents major decline in salinity and transition from brackish toward freshwater conditions, with associated changes in benthic fauna and implications for mangrove and brackish-water communities.		**Endemic/Range-Restricted Species:** strong supporting evidence through IBA/KBA-related bird information. **E – Migratory Species/Routes or Congregations: strong evidence** through Little Egret and wider migratory/wetland bird importance. **F – Habitat Highly Suitable for Biodiversity Conservation: strong evidence** through national importance, mangrove rarity, wetland ecological character and ecosystem functions.		population estimates for candidate KBF species.
R6	**Mahon et al. – *Graeme Hall Swamp Barbados : studies, surveys, plans and development up to 2025*. CERMES Technical Report No. 110, UWI Cave Hill**	**2025**	Comprehensive Graeme Hall-specific synthesis covering watershed and wetland boundaries; geology; hydrology and limnology; connection to the sea; adjacent marine environment; terrestrial ecosystems and biodiversity; human uses and impacts; sewage discharges; flooding; development; management; and ecosystem monitoring. Identifies Graeme Hall as the **last remaining complete coastal wetland ecosystem of its kind in Barbados** and synthesises extensive evidence on mangroves, fish, wetland birds and ecological connectivity. Reviews Graeme Hall IBA/KBA recognition and the	**Very High** – entire Graeme Hall system, watershed, sea connection and adjacent marine environment. Particularly important for defining the CHA assessment area and understanding ecological connectivity and historical/current change.	**A – Existing or Proposed Protected Area / Internationally Recognized Site:** strong synthesis of Ramsar and national conservation status. **B – Area Necessary to Maintain a Protected Area: very strong evidence** through watershed, groundwater, sea connection, lagoon and marine ecological linkages. **C – Habitat Crucial for CR/EN/VU/NT Species:** important evidence gateway for threatened-species occurrence. **D – Endemic/Range-Restricted Species:** strong supporting evidence through four range-restricted bird taxa and Yellow Warbler information. **E – Migratory Species/Routes or Congregations: very strong evidence** through Little Egret, nesting colonies and wider migratory bird use. **F – Habitat Highly Suitable for Biodiversity Conservation: very strong evidence**, particularly the identification	**High – core evidence source.** Recent Graeme Hall-specific technical synthesis by UWI/CERMES and specialist authors, drawing together an extensive scientific and technical evidence base.	Primarily a **synthesis/evidence gateway**, rather than a new comprehensive ecological survey. Underlying evidence spans several decades. Material species records, population thresholds and current-condition findings should be traced to original sources or recent verification where they could change the CHA determination.

REF.	SOURCE	DATE	INFORMATION EXTRACTED	SPATIAL RELEVANCE	CHA CRITERION SUPPORTED	RELIABILITY	GAP/LIMITATION
			underlying evidence concerning four range-restricted birds and Little Egret. Also provides recent habitat mapping based on **2023 drone imagery** and consolidates historical ornithological evidence, including nesting/roosting use by wading birds.		of Graeme Hall as the last remaining complete coastal wetland ecosystem of its kind in Barbados and the island's last remaining mangrove forest.		
R7	**BrinsJen Systems Development Specialists – ESIA and ESMP for the Workers' Camp, BA-L1063**	**July 2026; field work April 2026**	Provides the **most recent project-area field evidence** reviewed. Includes April 2026 Rapid Biodiversity Assessment and geo-referenced flora/fauna observations around workers' camp/project footprint; largely modified grassland camp habitat; conservation-priority trees near project/access areas; contemporary bird observations including Barbados Bullfinch; compilation of Graeme Hall bird and fish records; recent water-quality sampling from swamp, canal and connected stream; evidence of freshwater shift/salinity change; and project-specific clearing, runoff, sediment, wastewater, spill, noise and wildlife-disturbance pathways.	**Very High** – workers' camp, existing and proposed treatment-plant environs, immediate Graeme Hall interface and connected waterways.	**A – Existing or Proposed Protected Area / Internationally Recognized Site:** supporting through recognition of Graeme Hall/Ramsar context. **B – Area Necessary to Maintain a Protected Area:** strong evidence through recent project–wetland interface and connected waterways. **C – Habitat Crucial for CR/EN/VU/NT Species:** supports threatened-species screening, including project-proximate flora and marine taxa referenced in the study. **D – Endemic/Range-Restricted Species:** supports through contemporary Barbados Bullfinch occurrence and compiled Graeme Hall bird evidence. **E – Migratory Species/Routes or Congregations:** supports through compiled Little Egret/migratory-bird evidence. **F – Habitat Highly Suitable for Biodiversity Conservation:** supports through wetland ecological condition, mangrove context and recent environmental observations.	**High** for project configuration and April 2026 observations/sampling; **Medium–High** for broader biodiversity baseline.	Rapid field survey with limited seasonal coverage. Many wider Graeme Hall species records are literature-derived rather than April 2026 observations. The assessment explicitly was not a formal CHA. Its conclusion concerning absence of Critical Habitat within the camp footprint should therefore not be treated as a CHA determination. Single-period water sampling is not a temporal trend dataset.

REF.	SOURCE	DATE	INFORMATION EXTRACTED	SPATIAL RELEVANCE	CHA CRITERION SUPPORTED	RELIABILITY	GAP/LIMITATION
R8	**IUCN Red List of Threatened Species™ – online database;**	**Current database; accessed Aug. 2026**	Used to verify current global conservation status of priority species emerging from project/Graeme Hall records and to identify species requiring further CHA screening. Priority screening included threatened plants, *Acropora* corals, marine turtles, Little Egret, Barbados Bullfinch and other endemic/range-restricted birds. Particularly relevant to distinguishing global threat status from site-level importance: globally LC species may remain CHA-relevant because of range restriction, breeding, migration or congregation.	**Species-specific** – relevance depends on confirmed occurrence/use within project footprint, Graeme Hall or connected coastal/marine assessment area.	**C – Habitat Crucial for CR/EN/VU/NT Species: primary evidence source for current global conservation status**. **D – Endemic/Range-Restricted Species:** supporting where Red List range/distribution information is relevant. **E – Migratory Species/Routes or Congregations:** only indirectly supportive; site-level congregation evidence must come from other sources.	**High** for current global Red List status.	Global Red List status alone does **not establish Critical Habitat** or local occurrence. Some subspecies/local populations are not separately assessed. Site dependence, abundance, breeding use and migratory/congregatory thresholds require evidence from other sources.
09	**Williams, A.N. – *The Wetlands of Graeme Hall: An Initial Assessment of Value***	**11 July 2008**	Historical synthesis of Graeme Hall wetland extent, watershed, floodplain and buffer context; wetland habitat map; mangrove, open-water, pond, canal, grassland and woodland habitats; former mangrove–seagrass–reef ecological linkage; sluice-controlled sea connection; migratory/native waterbird roosting and breeding functions; fish and other fauna; Ramsar/Natural Heritage designations; wetland	**High – Graeme Hall Ramsar wetland, Nature Sanctuary, 100-year floodplain, buffer areas, 1,158-acre watershed and St Lawrence Lagoon/coastal connection.**	**A - Existing or Proposed Protected Area / Internationally Recognized Site:** – supports Ramsar/Natural Heritage context; **B – Area Necessary to Maintain a Protected Area: strong historical support** for watershed, buffer, drainage and wetland–sea processes needed to maintain the site; **E –Migratory Species/Routes or Congregations:** supports migratory/congregatory bird use; **F – Habitat Highly Suitable for Biodiversity Conservation:** strong supporting evidence on ecological functions, habitat/refuge value, wetland	**Medium–High as historical synthesis; Medium for biodiversity baseline.** Useful for spatial/ecological history and historical pressures.	**Dated 2008 and not a biodiversity field survey.** Primarily an economic valuation based on desk review and secondary sources. Many ecological statements derive from the 2007 Master Plan, Ramsar, UNESCO/CARICOMP and earlier studies, so it should not be treated as independent

REF.	SOURCE	DATE	INFORMATION EXTRACTED	SPATIAL RELEVANCE	CHA CRITERION SUPPORTED	RELIABILITY	GAP/LIMITATION
			hydrological, pollutant-attenuation, habitat/refuge and monitoring functions; CARICOMP mangrove–seagrass monitoring; historical 2005 raw-sewage diversion into GHS; agricultural/vector-control pressures; restoration, buffer and monitoring considerations.		rarity and land–sea connectivity.		corroboration where those underlying sources are already used. Current habitat condition, species abundance and monitoring status require newer evidence.
10	**Environmental Engineering Consultants, Inc. (EEC) – *Mangrove Ecosystem Assessment: Graeme Hall Nature Sanctuary, Barbados***	**30 Apr. 2010**	Primary field investigation of wetland environmental health including surface-water and sediment chemistry, bacteriological sampling, benthic community assessment, mangrove/biological indicators, fish/crab sampling, drainage, geology/hydrogeology and surrounding pollution sources. Documents 1,156-acre surface-water catchment; groundwater and surface-water pathways into GHS; SCSTP immediately adjacent to Ramsar site; historical emergency sewage discharge pathway; dysfunctional sluice and restricted tidal exchange; decline in lake salinity from 8.4 ppt (2002) to 1.9 ppt (2010); freshwater transformation of	**Very High – GHNS and wider GHS hydrological system; includes Ramsar wetland, adjacent SCSTP, agricultural lands, drainage network, groundwater/surface-water catchment, Bisecting Canal, sluice and coastal outlet.**	**A – Existing or Proposed Protected Area / Internationally Recognized Site:** corroborates Ramsar/international recognition; **B – Area Necessary to Maintain a Protected Area:** – strong direct evidence that hydrological processes and activities beyond the protected-area boundary maintain/influence ecological character; **E– Migratory Species/Routes or Congregations:** – migratory bird habitat and roosting; **F – Habitat Highly Suitable for Biodiversity Conservation:** mangrove ecological character, rarity, long-term persistence, ecological degradation and dependence on hydrological/tidal processes. Also highly relevant to Steps 5–6 impact pathways.	**High for 2010 conditions.** Primary multidisciplinary field investigation with environmental sampling, laboratory analyses, biological assessment, drainage/hydrogeological investigation and site reconnaissance.	**Historical (2010);** conditions cannot be assumed to represent 2026 status. Study commissioned by GHNS and field investigations focus substantially on the privately owned Sanctuary portion rather than providing uniform ecological sampling across the entire Ramsar site. Some historical/background information is secondary. Contemporary condition and species presence require verification.

REF.	SOURCE	DATE	INFORMATION EXTRACTED	SPATIAL RELEVANCE	CHA CRITERION SUPPORTED	RELIABILITY	GAP/LIMITATION
			mangrove ecosystem; replacement of saltwater benthos by freshwater taxa; poor water quality, pesticides and nutrient loading; fish/crab kills; mangrove sensitivity to loss of tidal exchange; migratory bird habitat and egret roosting; historical mangrove–seagrass–reef connectivity.				
11	**Lashley, C. H. – *Collaboration and enforcement: the missing pieces of the puzzle in managing the Graeme Hall Swamp in Barbados*. Case study prepared for Global Water Partnership training**	**Mar. 2016**	Synthesis of Graeme Hall watershed characteristics, ecological importance, surrounding land uses, hydrological constraints, pollution pressures and management/governance issues. Identifies 1,156-acre watershed; GHS relationship with St. Lawrence Lagoon; mangrove–seagrass–reef proximity; resident/migratory bird importance; surrounding residential, commercial and agricultural land uses; South Coast Sewerage Treatment Facility; runoff and nutrient pathways; historical emergency sewage discharge; impaired seawater exchange and sluice operation; reported salinity decline; and need for integrated watershed management.	**High – wider Graeme Hall watershed, Ramsar wetland, surrounding agricultural/residential/commercial areas, SCSTP and wetland–coastal connection.**	**A – Existing or Proposed Protected Area / Internationally Recognized Site:** corroborates international/national recognition; **B – Area Necessary to Maintain a Protected Area:** – supports functional importance of wider watershed and hydrological processes outside Ramsar boundary; **E – Migratory Species/Routes or Congregations:** corroborates migratory/wading-bird importance; **F – Habitat Highly Suitable for Biodiversity Conservation:** supports uniqueness and vulnerability of coastal wetland/mangrove ecosystem. Relevant to Steps 1, 5 and 6.	**Moderate–High as synthesis/contextual source.** Prepared for GWP training and draws on government, technical and academic sources. Useful integration of watershed, governance, hydrology and ecological pressures.	Predominantly secondary literature review rather than primary field investigation. Much technical/ecological evidence derives from earlier sources already included in CHA evidence base. Historical species-status terminology should not be used as current conservation status. Does not establish current 2026 conditions.

REF.	SOURCE	DATE	INFORMATION EXTRACTED	SPATIAL RELEVANCE	CHA CRITERION SUPPORTED	RELIABILITY	GAP/LIMITATION
	on Integrated and Adaptive Water Resources Planning, Management and Governance.		Includes watershed and habitat maps illustrating wetland relationship to wider catchment and coastal environment.				

Note: The "CHA Criterion Supported" column identifies criterion(s) from Step 3 in the CHA Methodology to which each source contributes evidence. It does not constitute the determination that the criterion is met. Final screening positions will be assigned in the Critical Habitat Assessment Matrix as **Confirmed Trigger, Potential Trigger, Not Triggered, or Insufficient Information**, based on the combined evidence for each KBF.

Annex B. Priority Species Screening Matrix

Rapid Critical Habitat Assessment

Priority Species Screening Matrix

Table 204 presents the priority species screening matrix.

Table** 204**: Priority species screening matrix

Scientific Name	Common Name	Taxon	Source/Record	Resident/ Migratory	IUCN Status	Endemic/Range Restricted?	Habitat Association	CHA Relevance
Egretta garzetta	Little Egret	Bird	**R1, R2, R3, R5, R6, R7** – historical/site and breeding records; R8 status	Resident breeding population at GHS; species also dispersive/migratory	**LC**	No	Mangrove islands, wetland margins and shallow water; nesting, roosting and foraging habitat	**Very High – Criterion E.** Historical evidence indicates GHS supported ≥1% of a biogeographic population and an important breeding colony; potential direct congregatory/breeding trigger
Egretta thula	Snowy Egret	Bird	**R1, R2, R3, R5, R6, R7** – historical/site and nesting records; R8 status	Resident / locally dispersive	**LC**	No	Mangrove nesting/roosting areas, marsh and shallow wetland	**High – Criteria E/F.** Important component of GHS nesting/roosting assemblage and Ramsar ecological character
Bubulcus ibis	Cattle Egret	Bird	**R1, R2, R3, R5, R6, R7** – principally historical/site records; R8 status	Resident / locally dispersive	**LC**	No	Mangrove nesting/roosting areas, wetland margins, grassland/agricultural areas	**Supporting – Criteria E/F.** Historically important component of congregatory nesting/roosting assemblage
Loxigilla barbadensis	Barbados Bullfinc	Bird	**R7 – observed April 2026** in project environs;	Resident	**LC**	**Yes – Barbados endemic**	Woodland, shrubland and wooded wetland margins; project	**High – Criterion D.** Contemporary occurrence confirmed and species forms part of GHS range-restricted bird assemblage

Scientific Name	Common Name	Taxon	Source/Record	Resident/ Migratory	IUCN Status	Endemic/Range Restricted?	Habitat Association	CHA Relevance
	h		R1, R3, R5, R6 – site/literature records; R8 status				environs	
Setophaga petechia /Dendroica petechia	Yellow Warbler / Barbados Yellow Warbler	Bird	**R1, R2, R3, R5, R6, R7, R11** – historical/site records including historical breeding estimate; R8 species status	Resident breeding population	**LC at species level**	**Barbados population/subspecies range-restricted**	Mangrove, shrubland and wetland-edge vegetation	**High – Criterion D.** Historical evidence indicates an important breeding population at GHS
Eulampis holosericeus	Green-throated Carib	Bird	**R3, R5, R6, R7** – site/literature records; R8 status	Resident	**LC**	**Caribbean/ Lesser Antillean restricted range**	Woodland, shrubland and flowering wetland-edge vegetation	**High – Criterion D**, principally as part of the range-restricted resident bird assemblage
Orthorhyncus cristatus	Antillean Crested Hummingbird	Bird	**R3, R5, R6, R7** – site/literature records; R8 status	Resident	**LC**	**Lesser Antillean range-restricted**	Woodland, scrub and flowering vegetation	**High – Criterion D**, as part of range-restricted assemblage
Elaenia martinica	Caribbean Elaenia	Bird	**R3, R5, R6, R7** – site/literature records; R8 status	Resident	**LC**	**Caribbean-restricted**	Woodland, scrub and wetland-edge vegetation	**High – Criterion D**, as part of range-restricted assemblage
Calidris pusilla	Semipalmated Sandpiper	Bird	**R6 – historical/site record;** R8 – status	**Migratory**	**NT**	No	Shallow wetlands, mudflats and wetland margins used principally for migratory feeding and	**High – Criteria C/E.** Near Threatened long-distance migratory shorebird recorded at GHS; relevant to Criterion C screening and strengthens evidence for GHS as habitat for migratory wetland birds under Criterion E

Scientific Name	Common Name	Taxon	Source/Record	Resident/ Migratory	IUCN Status	Endemic/Range Restricted?	Habitat Association	CHA Relevance
							roosting	
Falco peregrinus	Peregrine Falcon	Bird	**R3, R5, R6, R11** – historical/site records; R8 status	Migratory/ visitor	**LC**	No	Open wetland/coastal habitat and prey-rich bird habitat	**Supporting – Criterion E.** Historic Ramsar relevance, but not a current Criterion C threatened-species trigger
Fulica americana (Historically *F. caribaea*)	American Coot / historically Caribbean Coot	Bird	**R3, R5, R6, R11** – historical/site records; R8 taxonomy/status	Resident/ visitor	**LC**	No	Open water, ponds and freshwater/brackish marsh	**Supporting – Criteria E/F.** Component of wetland bird assemblage and ecological character
Pluvialis dominica	American Golden-Plover	Bird	**R4, R6, R7** – migratory/site records; R8 status	**Migratory**	**LC**	No	Mudflats, shallow wetlands and open areas	**Criterion E.** Supports GHS migratory stopover/feeding function
Tringa flavipes	Lesser Yellowlegs	Bird	**R4, R6, R7** – migratory/site records; R8 status	**Migratory**	**LC**	No	Shallow freshwater/brackish wetland and mudflats	**Criterion E.** Component of migratory wetland assemblage
Calidris himantopus	Stilt Sandpiper	Bird	**R6, R7** – site/literature records; R8 status	**Migratory**	**LC**	No	Marshes, shallow ponds and mudflats	**Criterion E.** Component of migratory wetland assemblage
Limnodromus griseus	Short-billed Dowitcher	Bird	**R6, R7** – site/literature records; R8 status	**Migratory**	**LC**	No	Shallow wetland, mudflats and coastal margins	**Criterion E.** Supports migratory-wetland function
Calidris melanotos	Pectoral Sandpiper	Bird	**R4, R6** – migratory/site records; R8	**Migratory**	**LC**	No	Shallow wetland/mudflat habitat	**Criterion E.** Supports migratory stopover function

Scientific Name	Common Name	Taxon	Source/Record	Resident/ Migratory	IUCN Status	Endemic/Range Restricted?	Habitat Association	CHA Relevance
			status					
Sterna dougallii	Roseate Tern	Bird	**R6** – historical/site record; R8 status	Migratory/ marine	**LC**	No	Coastal and marine feeding habitat	**Potential supporting Criterion E.** GHS record alone does not demonstrate site importance
Rhizophora mangle	Red Mangrove	Plant	**R1, R2, R3, R5, R6, R7** – extensive site/habitat records; R8 status	N/A	**LC**	No globally; **nationally rare/important habitat-forming species**	Brackish mangrove forest and lake margins	**Very High – Criteria F/B.** Core habitat-forming species and component of Ramsar ecological character
Laguncularia racemosa	White Mangrove	Plant	**R1, R2, R3, R5, R6, R7** – extensive site/habitat records; R8 status	N/A	**LC**	No globally; nationally important habitat-forming species	Mangrove forest, particularly less saline margins	**Very High – Criteria F/B.** Core component of nationally rare GHS mangrove ecosystem
Avicennia germinans (Historically *A. nitida*)	Black Mangrove	Plant	**R3, R5, R6** – principally historical records; R8 status	N/A	**LC**	No	Mangrove/intertidal wetland	**Supporting – Criterion F.** Part of historical mangrove diversity and ecological character
Conocarpus erectus	Buttonwood / Button Mangrove	Plant	**R3, R5, R6** – historical/site records; R8 status	N/A	**LC**	No	Upper wetland/mangrove transition	**Supporting – Criterion F.** Component of wetland vegetation/ecological character
Eleocharis mutata	Sedge / Rush	Plant	**R1, R2, R5, R6** – marsh vegetation	N/A	**NE**	No evidence identified of restricted range	Freshwater marsh/sedge communities	**Supporting – Criterion F.** Characteristic habitat species rather than stand-alone KBF

Scientific Name	Common Name	Taxon	Source/Record	Resident/ Migratory	IUCN Status	Endemic/Range Restricted?	Habitat Association	CHA Relevance
			records					
Guaiacum officinale	Roughbark Lignum-vitae / Tree of Life	Plant	**R7 – observed April 2026** immediately adjacent/near project area; R8 status	N/A	**EN**	Regionally distributed; not Barbados endemic	Dry terrestrial/tree habitat or landscaped environment near project footprint	**High – Criterion C.** Threatened species in immediate project environs; strong avoidance relevance
Swietenia mahagoni	West Indian Mahogany	Plant	**R7 – observed April 2026** near project/access area; R8 status	N/A	**NT**	**Caribbean/ South Florida restricted native range**	Terrestrial woodland/landscaped project environs	**Criteria C/D screening.** Conservation-priority project-proximate species; current evidence does not establish crucial habitat
Megalops atlanticus	Atlantic Tarpon	Fish	**R2, R3, R5, R6, R7** – historical/site records; persistence recorded in 2019; R8 status	Resident/use of GHS; marine/estuarine connected	**VU**	No	Fresh/brackish lake, canals, estuarine and marine environments	**High – Criterion C; also supports B/F**. Vulnerable species historically associated with GHS and an important top predator within the wetland food web, including a reported role in regulating tilapia populations. Its occurrence also provides evidence of wetland –marine ecological connectivity.
Kryptolebias marmoratus	Mangrove Rivulus	Fish	**R2, R5, R6** – historical/site records; R8 status	Resident	**LC**	No	Mangrove pools and shallow brackish wetlands	**Supporting – Criteria F/B.** Component of mangrove aquatic biodiversity/ecological character
Centropomus undecimalis	Common Snook	Fish	**R2, R3, R6** – historical GHS records; R8 status	Marine/ estuarine migrant; historically used wetland	**LC**	No	Estuarine channels, mangrove and coastal waters	**Supporting – Criteria B/F.** Evidence of historical wetland–marine ecological connectivity
Mugil curema	White Mullet	Fish	**R2, R3, R6** – historical GHS records; R8 status	Marine/ estuarine migrant/resident	**LC**	No	Brackish lake, channels and nearshore waters	**Supporting – Criteria B/F.** Evidence of historical connectivity and fish-community function

Scientific Name	Common Name	Taxon	Source/Record	Resident/ Migratory	IUCN Status	Endemic/Range Restricted?	Habitat Association	CHA Relevance
Acropora palmata	Elkhorn Coral	Coral	**R1, R2, R3, R6** – marine/site context; R8 status	N/A	**CR**	**Caribbean/ western Atlantic restricted**	Shallow, high-energy coral reef	**Very High – Criteria C/F.** Potential direct threatened-species KBF if current occurrence within the relevant marine area is established
Acropora cervicornis	Staghorn Coral	Coral	**R1, R2, R6** – marine context; R8 status	N/A	**CR**	**Caribbean/ western Atlantic restricted**	Shallow to moderate-depth coral reef	**Very High – Criteria C/F.** Potential threatened-species KBF
Eretmochelys imbricata	Hawksbill Turtle	Reptile	**R1, R4, R6** – national/project marine context; R8 status	**Migratory**	**CR**	No	Coral reef/coastal foraging habitat and sandy nesting beaches	**High – Criterion C; potentially E.** CR migratory species with clear South Coast relevance
Chelonia mydas	Green Turtle	Reptile	**R1, R4, R6** – national/project marine context; R8 status	**Migratory**	**LC globally**	No	Seagrass beds and shallow coastal/reef habitats used for foraging; sandy beaches may provide nesting habitat.	**Supporting – Criteria E/F and Key Biodiversity Features (KBF).** Migratory marine species associated with seagrass foraging habitat, including the St Lawrence Lagoon seagrass system into which Graeme Hall Swamp drains. Its occurrence reinforces the ecological relevance of the connected coastal and marine habitats considered under **KBF 5: Connected Coastal and Marine Habitats,** although its current global LC status does not independently trigger Criterion C.

Source Codes

R1 – BA-L1063 2024 ESIA, ESMP and ESMS
R2 – Earlier NEMUS ESMP and biodiversity studies cited within the 2024 documents
R3 – Ramsar Information Sheet and Ramsar site information for Graeme Hall
R4 – Barbados National Biodiversity Strategy and Action Plan
R5 – Barbados National Wetland Inventory

R6 – *Graeme Hall Swamp Barbados: Studies, Surveys, Plans and Development up to 2025*
R7 – BrinsJen Systems Development Specialists – ESIA and ESMP for the Workers' Camp, BA-L1063
R8 – IUCN Red List of Threatened Species™ / current online status verification
R9 - *The Wetlands of Graeme Hall: An Initial Assessment of Value 2008*
R10 - Mangrove Ecosystem Assessment: Graeme Hall Nature Sanctuary, Barbados 2010
R11 - Collaboration and enforcement: the missing pieces of the puzzle in managing the Graeme Hall Swamp in Barbados.

IUCN Red List Status Key

EX – Extinct

EW – Extinct in the Wild

CR – Critically Endangered

EN – Endangered

VU – Vulnerable

NT – Near Threatened

LC – Least Concern

DD – Data Deficient

NE – Not Evaluated / no current IUCN assessment confirmed

CHA Criterion Key

A – Existing or Proposed Protected Area / Internationally Recognized Site

B – Area Necessary to Maintain a Protected Area

C – Habitat Crucial for CR/EN/VU/NT Species

D – Endemic/Range-Restricted Species

E – Migratory Species/Routes or Congregations

F – Habitat Highly Suitable for Biodiversity Conservation

Note: This matrix is a priority CHA screening tool rather than a complete inventory of all species recorded from Graeme Hall Swamp and the surrounding environment. Species were prioritized where the available evidence indicates potential relevance to **Criterion C – Habitat Crucial for CR/EN/VU/NT Species; Criterion D – Endemic/Range-Restricted Species; Criterion E – Migratory Species/Routes or Congregations; or Criterion F – Habitat Highly Suitable for Biodiversity Conservation**, including species that help define wetland ecological character and functional connectivity. The wider species inventories contained in the source documents may be retained as supporting annex material. Historical occurrence has not been treated as equivalent to contemporary presence. Where a species could materially affect the Critical Habitat determination, current verification is identified, particularly for Little Egret, Atlantic Tarpon, threatened corals, marine turtles and project-proximate threatened flora.

Annex C. Ecological Field Verification Report

Ecological Field Verification Report

Rapid Critical Habitat Assessment

Introduction and Purpose

As part of the Rapid Critical Habitat Assessment (CHA) for the Barbados Climate Resilient South Coast Water Reclamation Project and Reuse Facilities, three ecological field verification visits were undertaken on **21, 24 and 28 August 2026**. The exercise was designed to ground-truth the findings of the desktop assessment and provide current field evidence concerning habitat condition, Key Biodiversity Features (KBFs), hydrological and ecological connections, existing environmental pressures and the principal interfaces between the proposed Project and the wider Graeme Hall wetland system.

The field verification was specifically intended to:

- confirm the presence and general condition of major habitat types identified through the desktop review;
- verify spatial relationships between the Project and Graeme Hall Swamp, particularly drainage and hydrological connections;
- document visible evidence of existing habitat degradation and environmental pressures;
- verify credible pathways through which Project activities could potentially affect Critical Habitat features;
- record opportunistic observations of flora and fauna relevant to the CHA;
- identify sensitive areas potentially requiring avoidance or other management measures; and
- determine whether field findings materially altered the desktop evidence, preliminary KBF screening or preliminary Critical Habitat Assessment Area (CHAA).

The three visits provided repeat observations under differing weather conditions. Conditions were slightly overcast with light rainfall on 21 August, sunny on 24 August, and overcast with scattered showers on 28 August. The exercise covered the seven field verification stations, subject to access constraints (*please refer to Figure 83: Ecological Field Verification Route & Table1: Field Verification Stations)*

Field Verification Approach

The verification followed the approved Rapid CHA Field Verification Methodology and used the same seven stations across the visits, where accessible

Table 205 presents the field verification stations.

Table** 205**: Field Verification Stations

Station	Verification Area	Principal Purpose
FV-01	SCSTP / Project Interface	Project footprint and immediate wetland interface
FV-02	Eastern Marsh	Wetland habitat closest to Project
FV-03	Upper Drainage	Drainage and hydrological inputs
FV-04	Bisecting Canal	Internal wetland connectivity
FV-05	Nature Sanctuary	Representative Core Critical Habitat features
FV-06	Southern Wetland Interface	Wetland–urban/coastal interface
FV-07	Sluice Gate / Coastal Connection	Downstream wetland–coastal connectivity

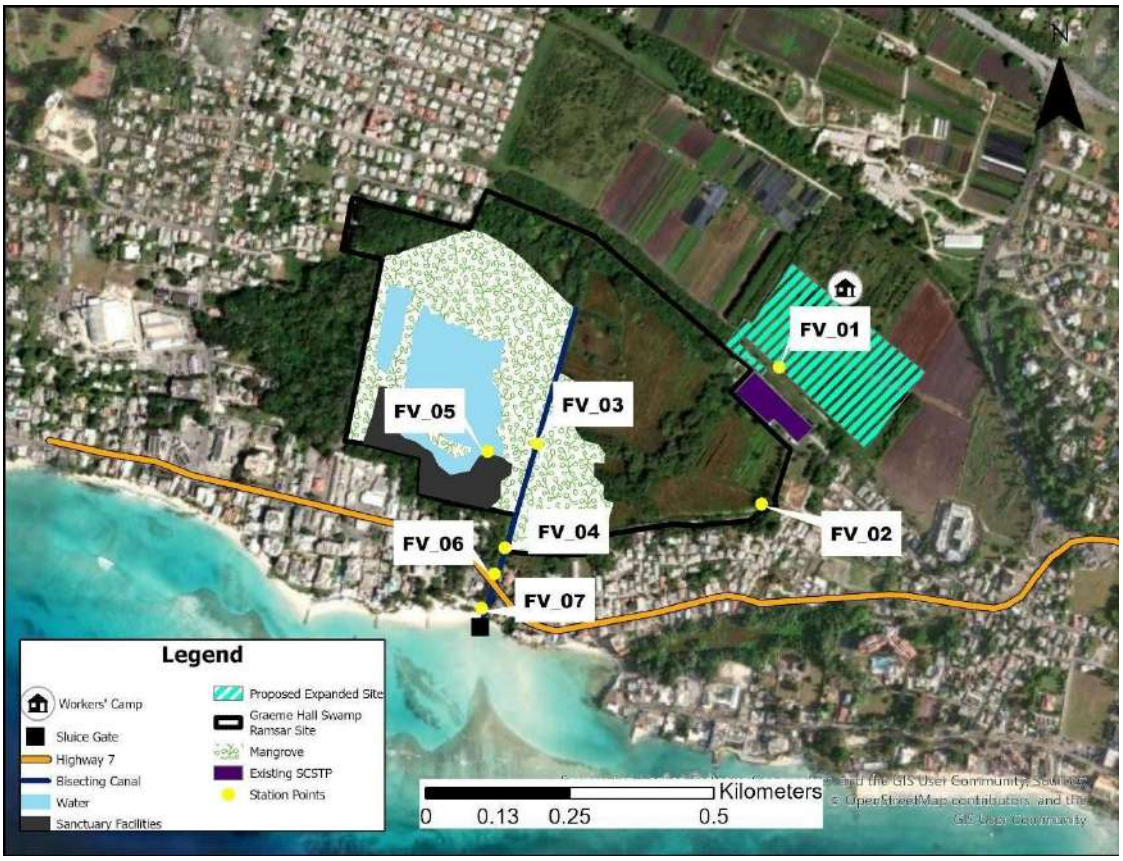


Figure 83: Ecological Field Verification Stations

At each accessible station, observations were made of habitat and vegetation condition, open/standing water, wildlife, drainage and apparent hydrology, visible environmental pressures and relevant Project–habitat interfaces. Photographs and GPS coordinates were recorded where practicable. Habitat condition was qualitatively assessed using the **Good – Moderate – Degraded – Highly Degraded** classification specified in the methodology.

The Upper Drainage station (FV-03) could not initially be accessed on 21 August because of dense vegetation but was subsequently accessed on 24 and 28 August after a route was opened. The remaining August stations were observed across the three-day exercise.

Access to the **Graeme Hall Nature Sanctuary** was not granted in time for the August field exercise. Accordingly, observations reported for FV-05 are **not August 2026 verification observations**. They are based on the Field Officer's most recent visit to the Sanctuary on **10 April 2026** and are retained solely to provide recent contextual information for that station.

The exercise was a rapid verification rather than a comprehensive flora, fauna or seasonal survey. Accordingly, wildlife records are opportunistic, and non-detection during the visits should not be interpreted as evidence of species absence.

● Field Verification Findings

o *FV-01 – SCSTP / Project Interface*

FV-01 confirmed the location of the Project site within the broader natural watershed immediately north of the Graeme Hall wetland system. The area comprised predominantly brushland/shrubbery with several mature trees, including mahogany and lignum-vitae/Tree of Life, together with River Tamarind, Jamaica Caper and other vegetation recorded along the site margins. Overall habitat and vegetation condition at the station were assessed as **Good**. Birds and butterflies were observed opportunistically, including a cattle egret.

Figure 84 shows the site for the new Water Reclamation Facility at the Project interface.



Figure 84: Project Interface - Site for the new Water Reclamation Facility

A natural gully was observed along the eastern side of the Project area, further demonstrating the local drainage setting. The field evidence supported the desktop understanding that the Project is situated within the watershed from which water generally drains southwards toward the wetland and ultimately toward the coast.

Figure 85 shows the natural gully to the east of the Project site.



Figure 85: Project Interface – Natural Gully to the East of the Project Site

Project works and construction access were evident. Shade cloth was being used as an existing dust-control measure. No wetland encroachment was identified at this station, and a physical separation between the Project area and wetland habitat remained evident. Existing lighting and some activity/noise associated with the existing plant were also noted.

Figure 86 shows shade cloth being used for dust mitigation at the Project interface.



Figure 86: Project Interface: Shade cloth being used for dust mitigation

The principal CHA relevance of FV-01 is therefore not direct occupation of wetland habitat, but the **source–pathway relationship created by the site's position within the watershed**, particularly the potential for construction-related runoff and sediment to move downslope toward wetland receptors.

- *FV-02 – Eastern Marsh*

The Eastern Marsh, immediately southeast of the sewage treatment plant, comprised marsh habitat with open and standing water and was assessed as being in **Good to Moderate condition**. Vegetation was relatively well established and included sedge/rush habitat, Water Lettuce, Water Hyacinth, duckweed and other wetland and edge vegetation. Opportunistic fauna observations included butterflies, dragonflies, common ground doves, cattle egrets, mongooses and tilapia.

Standing water was present, with water depths recorded at approximately 2 ft 6 in or greater in some areas. The water showed tannin coloration but no notable odor during the field visits. No obvious siltation or sedimentation was recorded at the time of inspection.

Figure 87 shows the Eastern Marsh, southeast of the South Coast Sewage Treatment Plant.



Figure 87: Eastern Marsh – Southeast of the South Coast Sewage Treatment Plant

Importantly, the station confirmed **multiple urban surface-water drainage connections into the wetland**. Four drainage pipes/areas were identified as allowing surface water from the surrounding southeast urban environment to enter the swamp as part of the wider drainage/flood-management system. The photographic record documents drainage from both the Harmony Hall and Bamboo Road areas.

Figure 88 shows surface water drainage from Harmony Hall and Bamboo Road discharging into the swamp.



Figure 88: Surface water drainage from Harmony Hall & Bamboo Road (Urban environment) discharging into the swamp as part of flood mitigation

The station also showed evidence of existing anthropogenic pressures. Illegal dumping was recorded, including discarded household material and appliances. White mangroves at the edge of the marsh exhibited visible storm damage from **Hurricane Beryl,** as confirmed by fishermen in the area. The

photographic record also documents the collection/use of white-mangrove wood by fishermen from the St. Lawrence area for construction of fish pots.

Figure 89 shows illegal dumping in the Eastern Marsh.



Figure 89: Eastern Marsh – Illegal Dumping

Figure 90 shows White Mangrove (Laguncularia racemosa) wood in the Eastern Marsh.



Figure 90: Eastern Marsh – White Mangrove (Laguncularia racemosa) wood used by fisherman in the St. Lawrence area to make fishpots

Figure 91 shows White Mangrove (Laguncularia racemosa) in the Eastern Marsh damaged by Hurricane Beryl.



Figure 91: Eastern Marsh – White Mangrove (Laguncularia racemosa). Damaged by Hurricane Beryl

The field findings confirmed FV-02 as an important Project–habitat interface because it is located downslope of the Project and receives drainage from the surrounding watershed. Construction-related runoff, sediment transport and changes in drainage therefore constitute credible impact pathways requiring consideration in the CHA and subsequent mitigation planning.

- *FV-03 and FV-04 – Upper Drainage and Bisecting Canal*

The Upper Drainage and Bisecting Canal together confirmed the continuity of mangrove and wetland habitat within the government-owned portion of the Graeme Hall system and the importance of internal drainage pathways.

At FV-03, mature **red mangrove (*Rhizophora mangle*) and white mangrove (*Laguncularia racemosa*)** were recorded. Habitat conditions varied spatially. The eastern section appeared comparatively healthy, with a few fallen white mangroves, while fallen and damaged red mangroves were evident toward the western section. The recorded damage was attributed to Hurricane Beryl. Open/standing water was present, approximately 2–3 ft deep, with visible tannin coloration but no noticeable odor. No evident siltation, erosion, solid waste, or wastewater contamination was recorded at this station.

At FV-04, the canal was confirmed as a waterbody separating the privately owned and government-owned portions of the mangrove swamp and providing an internal hydrological connection between wetland areas. The channel was narrower toward its southern section and broadened northwards. Water depth was approximately 2 ft, with tannin coloration and no noticeable odor. Duckweed was present on the water surface.

Mangrove vegetation at FV-04 was assessed as **Good to Moderate**, although some red mangroves had also been damaged by Hurricane Beryl. Butterflies and dragonflies were observed along the margins. No significant sediment accumulation, erosion, debris or obvious contamination was observed during the visits.

Together, FV-03 and FV-04 demonstrate that the interior wetland retains substantial areas of mature mangrove habitat and standing/open water despite localized storm damage. They also support the

desktop interpretation that the wetland functions as an interconnected hydrological system rather than as isolated habitat patches.

- *FV-05 – Graeme Hall Nature Sanctuary*

No field verification of the Nature Sanctuary was undertaken during the 21, 24 or 28 August 2026 exercise because the necessary access permission was not received in time. The observations presented here therefore derive from the Field Officer's previous visit on **10 April 2026** and should not be interpreted as contemporaneous August observations.

During the April visit, the Nature Sanctuary supported mangrove swamp, open water and associated wetland habitats and was assessed as being in **Good to Moderate condition**. Red and white mangroves were present together with Sea Grape and Water Hyssop. Lake Tarpon provided a substantial open-water feature.

A comparatively diverse assemblage of birds and aquatic fauna was recorded during that visit, including Little Egret, Snowy Egret, Cattle Egret, Barbados Bullfinch, Barbados Yellow Warbler, Antillean Crested Hummingbird, Caribbean Elaenia, American Golden-Plover, Lesser Yellowlegs, Stilt Sandpiper, Short-billed Dowitcher and Pectoral Sandpiper. Atlantic Tarpon and tilapia were also recorded. Egret Island was identified as a breeding/nesting/roosting feature.

The April observations are consistent with the desktop evidence regarding the Sanctuary's ecological importance but pre-date the August verification exercise.

- *FV-06 – Southern Wetland Interface*

FV-06 represents the transition between the mangrove wetland and the developed Highway 7/coastal corridor. The area supported mangrove swamp and standing water and was assessed as being in **Moderate condition**. Some red mangroves showed storm-related damage, while Water Lettuce and duckweed were recorded within the waterbody.

Water depth was approximately 1 ft 5 in at the point measured. Tannin coloration was visible and no notable odor was recorded. The station also confirmed the continuation of the existing SCSTP outflow infrastructure through the wetland. Two pumping stations were observed and associated pipes continued southwards through this portion of the swamp toward Sandy Beach. Based on the proposed Project design, this existing conveyance pathway is expected to change, with treated water instead directed to the new water reclamation facility for reuse, including aquifer recharge and/or agricultural purposes.

Human influence is comparatively more pronounced at this station because of the proximity of Highway 7, existing infrastructure, road lighting and urban activity.

Figure 92 shows Station FV-06, the Southern Wetland Interface.



Figure 92: Station FV-06 – Southern Wetland Interface

- *FV-07 – Sluice Gate / Coastal Connection*

FV-07 confirmed the physical relationship between the Graeme Hall wetland system and the downstream coastal environment.

The sluice gate appeared to be **inoperable** during the field visits, with low, largely stagnant water within the channel. Tannin-related discoloration and a mild odor were recorded, together with some solid waste/debris. The observations indicated restricted wetland–coastal exchange at the time of the visits.

The station was therefore assessed as **Degraded**, principally because of the non-functioning sluice structure and evident beach erosion. The adjacent coastal habitat consisted of sandy beach and nearshore marine environment. The field record also notes that green sea turtles are common in the wider area and identifies a nearshore reef ecosystem as an ecologically relevant feature; these observations should be treated as contextual rather than as confirmation of turtle presence during the three verification visits.

Two existing SCSTP outflow pipes were traced through the southern wetland interface to the coastal outlet, where they continue offshore. This directly verified a Project/wastewater–wetland–coastal pathway that had been identified during the desktop assessment.

The apparent lack of effective sluice-gate operation is also important for understanding present wetland hydrology. No visible active exchange of seawater through the structure was observed during the visits, indicating that wetland–marine hydrological exchange was constrained at the time of verification.

Cross-Cutting Findings and Implications for the CHA

The field verification largely confirmed the desktop evidence. The principal findings relevant to the CHA are summarized below.

- *Wetland habitat and ecological condition*

The field visits confirmed a mosaic of marsh, mangrove, canal/open-water and coastal-interface habitats across the assessment area. Overall, the interior wetland was generally assessed as **Moderate to Good**, with mature red and white mangrove habitat remaining present. The Eastern Marsh was comparatively healthy, while localized mangrove damage was recorded in the Upper Drainage, Bisecting Canal and Southern Wetland Interface. A notable addition to the desktop evidence was the field confirmation of **visible residual mangrove damage attributed to Hurricane Beryl**, particularly affecting red and white mangroves in portions of the wetland.

- *Hydrological connectivity*

The exercise strongly confirmed that hydrological connectivity is a central feature of the Project–Critical Habitat relationship. The Project lies within a watershed draining generally southwards toward the Graeme Hall wetland and coast. Multiple urban drainage points discharge into the Eastern Marsh, while internal waterways connect different wetland components. Existing SCSTP outflow infrastructure extends through the southern wetland and ultimately offshore.

This field evidence reinforces **KBF 2 – Hydrological and ecological processes supporting Graeme Hall** and supports continued treatment of hydrological pathways as a principal basis for defining the Project's interaction with Critical Habitat.

- *Existing pressures*

Existing non-Project pressures recorded during the exercise included:

- localized illegal dumping in the Eastern Marsh;
- hurricane-related mangrove damage;
- urban stormwater inflows;
- existing wastewater conveyance infrastructure through the southern wetland;
- physical disturbance associated with the developed wetland margin;
- an apparently inoperable sluice gate;
- stagnant water and debris in the coastal outlet channel; and
- beach erosion at Sandy Beach.

These pressures are important to the CHA because they establish the existing condition and cumulative context within which Project impacts must be assessed.

- *Project-related pathways*

The field exercise verified two principal source–pathway–receptor relationships relevant to the subsequent impact assessment:

Project construction area → stormwater/runoff and potential sediment transport → Eastern Marsh/internal wetland → mangrove and wetland ecological processes;

And existing/current SCSTP infrastructure → southern wetland conveyance route → sluice/coastal outlet → nearshore marine environment.

The first pathway is particularly relevant during construction, while the second provides important context for assessing the changes associated with the proposed water reclamation system.

- *Key Biodiversity Features*

Field observations were consistent with the six KBF groupings identified during the CHA process:

- **KBF 1:** Graeme Hall Ramsar wetland and ecological character;
- **KBF 2:** hydrological and ecological processes supporting Graeme Hall;
- **KBF 3:** migratory/congregatory wetland birds;
- **KBF 4:** endemic and range-restricted resident birds;
- **KBF 5:** connected coastal and marine habitats; and
- **KBF 6:** threatened species associated with the Project/CHAA.

The August field exercise was particularly effective in verifying the physical habitat and hydrological basis for **KBFs 1, 2 and 5**. Opportunistic fauna observations provided supplementary evidence relevant to KBF 3, while the April Nature Sanctuary record provides contextual evidence for KBFs 3 and 4. The rapid nature of the exercise means the absence of particular priority species during the August visits should not affect the species screening conclusions.

- *Limitations and Follow-up*

The principal limitation of the exercise was the inability to obtain access to the **Graeme Hall Nature Sanctuary during the August verification period**. Consequently, FV-05 was not contemporaneously verified. The 10 April 2026 observations are useful supporting evidence but should remain clearly differentiated from the 21, 24 and 28 August observations.

The field exercise also did not include systematic fauna surveys, quantitative vegetation surveys, hydrological monitoring or water-quality sampling, consistent with its agreed rapid-verification scope.

Two matters in the field records would benefit from **project-team confirmation rather than additional ecological survey**:

- the function and configuration of the drainage/outflow pipes observed at the Eastern Marsh and downstream locations; and
- the operational status and operating regime of the sluice gate, which remains the responsibility of the Drainage Unit of the Ministry of Transport and Works (MTW).

These issues are relevant because both influence the interpretation of existing and future hydrological pathways.

No field finding indicates that the preliminary CHAA requires material contraction or expansion. Rather, the verified drainage network, internal wetland connectivity, existing southward conveyance route and coastal outlet support retaining the preliminary CHAA spatial framework, including the **Project–wetland interface, the interconnected Graeme Hall wetland system and the downstream coastal environment**, for subsequent Critical Habitat determination and impact-pathway assessment."

Conclusion

The three-day ecological field verification exercise substantially achieved its intended purpose of ground-truthing the desktop assessment and confirming current habitat, hydrological and Project–habitat conditions across the Graeme Hall assessment area.

Overall, the accessible wetland was found to be in **Moderate to Good ecological condition**, with established marsh and mangrove habitats, open and standing water, and opportunistic observations of wildlife. Localized degradation and disturbance were nevertheless evident, including hurricane-related mangrove damage, illegal dumping, existing infrastructure and urban influence.

Most importantly for the CHA, the field exercise clearly verified the **hydrological connectivity between the Project area, the wetland and the downstream coastal environment**. Surface-water drainage enters the wetland from the surrounding urban watershed, internal channels connect wetland areas, and the existing SCSTP outflow infrastructure continues through the southern wetland toward the coastal outlet. The apparently inoperable sluice gate currently constrains observable wetland–coastal water exchange.

The findings therefore reinforce the desktop identification of hydrological and ecological processes as a key consideration in assessing potential Project effects on Graeme Hall Critical Habitat. They also support continued assessment of construction-related runoff and sedimentation pathways and the potential consequences of changes to existing wastewater conveyance and wetland hydrology.

The field verification did **not identify evidence requiring a fundamental change to the preliminary Critical Habitat screening**. Rather, the observations provide current field confirmation to support refinement of the Biodiversity Evidence Register, KBF screening, Critical Habitat determination, impact-pathway assessment and subsequent mitigation and monitoring requirements.

Annexes

- *Annex 1: Completed Field Verification Data Sheet*
- *Annex 2: Field Verification Photographic Record*

Annex D. Critical Habitat Screening and Determination Matrix

Rapid Critical Habitat Assessment

Barbados Climate Resilient South Coast Water Reclamation Project and Reuse Facilities

Project No. BA-L1063 *5908/OC-BA/BA-L1063*

Final Critical Habitat Screening and Determination

Table 206 presents the final critical habitat screening and determination matrix.

Table** 206**: Final critical habitat screening and determination matrix

IDB Critical Habitat Criterion	**Relevant KBF(s)**	**Key Evidence – Desktop Assessment**	**Field Verification Evidence – August 2026**	**Final Determination**
Criterion A – Existing or Proposed Protected Area / Internationally Recognized Site	**KBF 1 – Graeme Hall Ramsar wetland and ecological character**	Graeme Hall Swamp is designated as a **Wetland of International Importance under the Ramsar Convention (Ramsar Site No. 1591)**. The designation establishes the international biodiversity significance of the wetland and its ecological character. Desktop evidence identifies the Ramsar wetland as comprising mangrove, marsh, open-water and associated wetland habitats supporting resident and migratory fauna and important ecological functions.	Field verification was consistent with the ecological characteristics identified through the desktop assessment. Accessible portions of the Graeme Hall wetland contained an established mosaic of **marsh, mangrove, canal/open-water and coastal-interface habitats**. The interior wetland was generally assessed as **Moderate to Good**, with mature red and white mangroves, marsh vegetation and open/standing water remaining present. No field observation contradicted the desktop evidence supporting the Ramsar designation. The Nature Sanctuary itself was not accessed during August; observations for FV-05 therefore remain based on the field officer's 10 April 2026 visit and existing literature.	**CONFIRMED TRIGGER.** Graeme Hall's designation as a Ramsar Wetland of International Importance independently satisfies Criterion A under the Critical Habitat framework applied in this assessment. Field verification does not alter this determination and provides current corroborating evidence that the wider wetland continues to support the wetland habitat types and ecological characteristics underpinning its biodiversity significance.

IDB Critical Habitat Criterion	Relevant KBF(s)	Key Evidence – Desktop Assessment	Field Verification Evidence – August 2026	Final Determination
Criterion B – Area Necessary to Maintain a Protected Area	**KBF 1 – Graeme Hall Ramsar wetland and ecological character** **KBF 2 – Hydrological and ecological processes supporting Graeme Hall** **KBF 5 – Connected coastal and marine habitats**	Desktop evidence identifies **hydrology, salinity regime, drainage and wetland –sea exchange** as fundamental to maintaining the ecological character and functioning of Graeme Hall. The wetland forms part of a wider watershed and hydrological system extending beyond the formal Ramsar boundary. Existing evidence also identifies the sluice gate/coastal outlet as an important component of the wetland's hydrological connection with the marine environment. The preliminary assessment therefore identified a strong functional basis for treating adjoining hydrologically connected areas as potentially necessary to maintain the Ramsar site.	Field verification **strongly confirmed the hydrological basis for this criterion**. The Project lies within a watershed draining generally southwards toward Graeme Hall and the coast. A natural gully was confirmed immediately east of the Project site. Multiple urban drainage points discharge into the Eastern Marsh, including **four drainage pipes/areas** conveying surface water from the surrounding southeast urban environment. The Upper Drainage and Bisecting Canal form part of the interconnected internal wetland system; the Bisecting Canal was confirmed as a waterbody connecting wetland areas. Existing SCSTP outflow infrastructure continues through the southern wetland toward the sluice/coastal outlet and offshore environment. The field report concludes that these verified connections support retaining the Project–wetland interface, interconnected Graeme Hall wetland system and downstream coastal environment within the preliminary CHAA.	**CONFIRMED TRIGGER.** Field verification resolves the principal uncertainty identified during preliminary screening by demonstrating the functional hydrological connections linking the Project watershed, Eastern Marsh, internal wetland drainage system, southern wetland and coastal outlet. These areas and processes contribute to maintaining the hydrological and ecological functioning of the internationally recognized Graeme Hall wetland and are therefore relevant under Criterion B.
Criterion C – Habitat Crucial for CR/EN/VU/NT Species	**KBF 6 – Threatened species associated with the Project/CHAA** Relevant candidate taxa identified during screening include **lignum-vitae (*Guaiacum officinale*)**, Atlantic	Desktop species screening identified several conservation-priority taxa occurring within or potentially using habitats within the CHAA. Evidence includes threatened terrestrial flora associated with the Project/wetland interface and threatened or conservation-priority aquatic/marine species potentially associated with the wetland–coastal system. However, the	Field verification strengthened occurrence evidence for **lignum-vitae (*Guaiacum officinale*)**, which was directly confirmed and photographed at FV-01 at the Project interface (Photographic Record, Photo 1). However, the rapid field exercise did not include targeted threatened-species surveys or establish abundance, population size, breeding status, habitat dependence or relative importance of the CHAA to candidate threatened species.	**POTENTIAL TRIGGER – NOT INDEPENDENTLY CONFIRMED.** Field verification strengthens evidence that at least one qualifying threatened species occurs at the Project interface but does not establish that affected habitat is crucial to the survival, feeding, breeding or movement of threatened taxa. The evidence is therefore

IDB Critical Habitat Criterion	Relevant KBF(s)	Key Evidence – Desktop Assessment	Field Verification Evidence – August 2026	Final Determination
	Tarpon, marine turtles and threatened coral taxa associated with the connected coastal/marine environment.	preliminary assessment did not establish that the CHAA represents habitat **crucial to the survival** of these species, and several marine species records relate to the wider coastal environment rather than confirmed dependence on the Project-affected area.	Marine habitats/species were similarly not systematically surveyed.	insufficient to confirm Criterion C independently. Candidate threatened species nevertheless remain KBFs/sensitive receptors requiring consideration in the Project impact assessment and mitigation framework.
Criterion D – Endemic or Range-Restricted Species	**KBF 4 – Endemic and range-restricted resident birds**	Desktop evidence identifies endemic and restricted-range resident birds associated with Graeme Hall and its surrounding habitats, including the **Barbados Bullfinch** and other restricted-range taxa. Historical records demonstrate that the wetland and adjoining habitats support a diverse resident avifaunal assemblage. However, available evidence did not establish the proportion of relevant species' populations supported by the CHAA or otherwise demonstrate that applicable population/range thresholds are met.	Opportunistic fauna observations were made during the field exercise, but the August verification did **not constitute a systematic avifaunal survey** and was not designed to establish abundance, population size or seasonal habitat use. The Nature Sanctuary could not be accessed during August, further limiting contemporary verification of the area most strongly associated with the documented resident bird assemblage. The 10 April 2026 Nature Sanctuary observations remain contextual supporting evidence rather than August field verification. The field report identifies the August exercise as particularly effective for KBFs 1, 2 and 5, while April observations provide contextual evidence for KBFs 3 and 4.	**POTENTIAL TRIGGER – NOT INDEPENDENTLY CONFIRMED.** Existing evidence supports the occurrence and conservation relevance of endemic and restricted-range species within Graeme Hall, but available desktop and rapid field evidence does not provide the population-level information required to demonstrate that the site meets Criterion D independently. KBF 4 is nevertheless retained for subsequent impact assessment because Project-related changes to wetland habitat or ecological functioning could affect resident bird habitat.
Criterion E – Migratory Species, Routes Or Congregations	**KBF 3 –Migratory/congregatory wetland birds**	Graeme Hall is well documented as habitat for **migratory, nesting and roosting wetland birds**. Historical evidence records a diverse migratory avifauna and identifies the wetland as an important refuge and feeding/roosting area. Preliminary	Field verification confirmed the continued presence of habitat capable of supporting migratory and congregatory birds, including **marsh, open/standing water, canal and mature mangrove habitat**. Birds were recorded opportunistically during the exercise. However, observations were not systematic and cannot	**POTENTIAL TRIGGER – HIGH CONFIDENCE.** Historical evidence, Ramsar context and continuing availability of suitable wetland habitat provide a strong basis for retaining Criterion E as a high-confidence potential trigger.

IDB Critical Habitat Criterion	Relevant KBF(s)	Key Evidence – Desktop Assessment	Field Verification Evidence – August 2026	Final Determination
		screening identified particularly strong evidence for this criterion, including historical evidence associated with species such as the **Little Egret**, but available current information did not conclusively demonstrate that applicable congregatory/population thresholds continue to be met.	establish abundance, seasonal use or current congregatory thresholds. The inability to access FV-05 during August also means that contemporary observations of the Nature Sanctuary's principal open-water/mangrove bird habitats were unavailable. The methodology expressly provides that non-detection during the rapid exercise cannot be interpreted as evidence of absence.	However, the rapid verification exercise did not generate the abundance or population-level evidence required to confirm current globally significant concentrations. Migratory/congregatory birds therefore remain a priority KBF for the Project impact, mitigation and monitoring assessment.
Criterion F – Habitat Highly Suitable for Biodiversity Conservation	**KBF 1 – Graeme Hall Ramsar wetland and ecological character** **KBF 2 – Hydrological and ecological processes supporting Graeme Hall** Related KBFs 3, 4 and 5 contribute to the site's overall conservation value.	Desktop evidence identifies Graeme Hall as the **largest remaining significant mangrove/wetland system of its type in Barbados** and a nationally rare ecosystem supporting mangrove, marsh, open-water and associated habitats. The wetland performs important hydrological and ecological functions and supports diverse resident and migratory fauna. Existing literature documents historical modification and degradation but also substantial remaining ecological value and opportunities for restoration. Preliminary screening therefore concluded that Graeme Hall's national rarity, ecological functions, biodiversity value and restoration potential satisfy Criterion F.	Field verification **strongly corroborated** this assessment. Accessible portions of the wetland retained a mosaic of established marsh, open/standing-water and mangrove habitat. Mature **red mangrove (*Rhizophora mangle*) and white mangrove (*Laguncularia racemosa*)** were confirmed in the Upper Drainage and Bisecting Canal. Overall interior wetland condition was **Moderate to Good**. Existing pressures included localized illegal dumping, hurricane-related mangrove damage, urban stormwater inputs, existing wastewater infrastructure, developed wetland margins, an apparently inoperable sluice gate, stagnant water/debris in the coastal outlet and beach erosion. Nevertheless, the field exercise did not indicate loss of the wetland's overall ecological value or functioning.	**CONFIRMED TRIGGER.** Current field evidence reinforces the desktop determination that Graeme Hall retains nationally significant wetland and mangrove biodiversity values despite localized degradation. Its rarity within Barbados, remaining mature wetland habitats, hydrological/ecological functions, biodiversity-support value and restoration potential support confirmation under Criterion F. Existing degradation is relevant to baseline condition and cumulative impact assessment but does not negate the site's Critical Habitat significance.

OVERALL DETERMINATION	**FINAL FINDING**
CRITICAL HABITAT / CRITICAL NATURAL HABITAT – CONFIRMED	**Graeme Hall Swamp qualifies as Critical Habitat/Critical Natural Habitat under the applicable IDB framework.** Criterion **A** is confirmed through its designation as a Ramsar Wetland of International Importance. Field verification additionally provides sufficient evidence to confirm **Criterion B**, demonstrating the functional hydrological connections between the Project watershed, interconnected wetland system and downstream coastal outlet, and strengthens the existing confirmed determination under **Criterion F** concerning the site's nationally significant wetland/mangrove biodiversity and ecological functions. Criteria **C, D and E** remain potential species-based triggers because the rapid assessment does not provide the population-level evidence necessary to confirm those criteria independently. Their associated threatened, endemic/range-restricted and migratory/congregatory species nevertheless remain Key Biodiversity Features requiring explicit consideration in the Project impact, significant conversion/degradation, mitigation and monitoring assessments.

Annex E. Critical Habitat Impact and Significance Matrix

Rapid Critical Habitat Assessment

Critical Habitat Impact and Significance Matrix

Table 207 presents the critical habitat impact and significance matrix**.** The matrix uses the Rapid Critical Habitat Assessment's own qualitative scale for vulnerability, magnitude, likelihood and residual significance. That scale is specific to the Critical Habitat test and is separate from the risk matrix in Section 5.3 that rates the impact pathways in Chapter 7.

Table 207***: Critical habitat impact and significance matrix***

Project Activity / Pressure	**KBF(s) Affected**	**Impact Pathway / Potential Effect**	**Existing ESIA/ESMP Mitigation**	**Vulnerability / Irreplaceability**	**Magnitude**	**Extent**	**Duration**	**Reversibility**	**Likelihood**	**Cumulative Context**	**Residual Significance**	**Significant Conversion / Degradation?**	**Additional CHA Measure / Requirement**
Construction Adjacent to Wetland / Vegetation Clearance	**KBF 1** – Ramsar wetland and ecological character; **KBF 6** – Threatened species	Direct encroachment or vegetation clearance could cause habitat loss/degradation or affect conservation-priority flora at the Project interface.	No wetland clearing; construction-area demarcation and localized development controls.	**Very High** for Ramsar wetland; **High** for conservation-priority flora.	**Low**, provided footprint remains outside wetland habitat.	Project interface / localized.	Short-term construction; permanent if habitat were lost.	Wetland habitat loss potentially difficult to reverse; localized terrestrial vegetation loss potentially restorable.	**Unlikely** with confirmed footprint controls.	Wetland already subject to surrounding urban/infrastructure pressure.	**Low**	**No**, provided there is no encroachment into Ramsar/ wetland habitat and sensitive vegetation is appropriately	Confirm final construction boundary/no-go areas before works; avoid wetland encroachment; identify and protect or appropriatel

Project Activity / Pressure	KBF(s) Affected	Impact Pathway / Potential Effect	Existing ESIA/ESMP Mitigation	Vulnerability / Irreplaceability	Magnitude	Extent	Duration	Reversibility	Likelihood	Cumulative Context	Residual Significance	Significant Conversion / Degradation?	Additional CHA Measure / Requirement
												managed.	y manage conservation-priority flora, including confirmed lignum-vitae, where affected by works.
Earthworks, Exposed Soils and Stormwater Runoff	**KBF 1** – Ramsar wetland/ecological character; **KBF 2** – Hydrological/ecological processes; secondarily KBFs 3, 4 and 6	Sediment-laden or contaminated runoff moves downslope from the Project area into the Eastern Marsh/internal wetland, causing increased turbidity, sedimentation or deterioration in water	Silt traps; drainage, erosion and sediment controls; construction-site management measures.	**Very High**	**Moderate pre-mitigation; Low with effective controls.**	Local; potentially extending through connected wetland drainage.	Short-term/ intermittent during construction, particularly rainfall events.	Generally reversible if limited and rapidly controlled; repeated inputs could have longer-term effects.	**Possible** without effective controls; **Unlikely** with effective implementation.	Existing urban runoff and water-quality pressures already affect the wetland. Field verification confirmed multiple existing drainage inputs.	**Low–Medium**	**No**, with effective erosion, sediment and stormwater controls. Uncontrolled or repeated substantial releases could contribute to degradation.	Treat prevention of runoff to Critical Habitat as a priority requirement. Confirm controls at the Project–wetland interface; inspect before/during earthworks and following significant

Project Activity / Pressure	KBF(s) Affected	Impact Pathway / Potential Effect	Existing ESIA/ESMP Mitigation	Vulnerability / Irreplaceability	Magnitude	Extent	Duration	Reversibility	Likelihood	Cumulative Context	Residual Significance	Significant Conversion / Degradation?	Additional CHA Measure / Requirement
		quality and aquatic/wetland habitat.											rainfall; maintain corrective-action records.
Chemical and Fuel Storage/Handling During Construction	**KBF 1, KBF 2, KBF 3 and KBF 6**	Spill or contaminated runoff enters the connected drainage system and wetland, causing toxicity, water-quality deterioration and effects on vegetation/aquatic fauna.	Bunded storage; spill-prevention and response measures; appropriate chemical/fuel handling and waste-management controls.	**Very High**	**Low–High**, depending on nature and volume of release.	Local; potentially wider where contaminants enter connected drainage.	Temporary to long-term depending on contaminant and event severity.	Generally reversible for small/contained spills; potentially difficult for substantial contamination.	**Unlikely** with controls.	Existing contamination/water-quality pressures increase sensitivity to additional pollutant loads.	**Low** under normal controlled conditions; potentially **High** for a major uncontrolled release.	**No under normal operations.** A substantial uncontrolled release could cause material degradation.	Ensure hazardous materials and refueling are kept away from wetland/drainage pathways; verify spill containment and response arrangements specifically account for Graeme Hall; immediate notification and response

Project Activity / Pressure	KBF(s) Affected	Impact Pathway / Potential Effect	Existing ESIA/ESMP Mitigation	Vulnerability / Irreplaceability	Magnitude	Extent	Duration	Reversibility	Likelihood	Cumulative Context	Residual Significance	Significant Conversion / Degradation?	Additional CHA Measure / Requirement
													for any release with potential to reach Critical Habitat.
Routine Operation / Change in Wastewater and Reclaimed-Water Management	**KBF 1** and **KBF 2**; indirectly KBFs 3, 4 and 6	Changes to existing wastewater conveyance and water management could alter water quantity, water quality, salinity or hydrological conditions supporting wetland ecological character. Conversely, diversion of treated water for reuse may	Operational treatment and water-quality controls; water-quality monitoring and management provisions contained in ESIA/ESMP.	**Very High**	**Low–Moderate**, subject to final operational configuration and hydrological response.	Functional wetland/hydrological area.	Long-term.	Potentially reversible through operational adjustment, depending on nature/duration of change.	**Possible**, given change from existing water-management arrangement.	Graeme Hall already experiences altered hydrology, constrained seawater exchange and water-quality pressures.	**Low–Medium**, subject to design confirmation and monitoring.	**Not anticipated**, provided operation does not cause material adverse alteration of wetland hydrology or water quality.	Confirm the future configuration/function of existing outflow and drainage infrastructure and demonstrate that final operating arrangements will not materially adversely alter the water balance, water quality, salinity regime or

Project Activity / Pressure	KBF(s) Affected	Impact Pathway / Potential Effect	Existing ESIA/ESMP Mitigation	Vulnerability / Irreplaceability	Magnitude	Extent	Duration	Reversibility	Likelihood	Cumulative Context	Residual Significance	Significant Conversion / Degradation?	Additional CHA Measure / Requirement
		reduce existing wastewater-related pressure.											ecological functioning of Graeme Hall. Establish appropriate operational monitoring.
Plant Failure, Overflow or Maintenance/Emergency Event	**KBF 1, KBF 2, KBF 3, KBF 5 and KBF 6**	Untreated or inadequately treated wastewater enters drainage/wetland/coastal pathways, causing acute water-quality deterioration, oxygen stress, contamination or habitat/faunal effects.	Existing emergency/operational provisions, plant controls and wastewater-management measures.	**Very High**	**High** for a substantial uncontrolled event.	Local to wider wetland system; potentially downstream coastal environment.	Short-term event with potentially longer-term ecological consequences.	Variable; potentially difficult to reverse if event is severe or prolonged.	**Unlikely**, assuming effective design, containment and response systems.	Existing wetland water-quality/hydrological stress could reduce ecological resilience to an additional acute event.	**Low–Medium** with robust containment; potentially **High/Critical** without containment.	**No under designed/managed conditions.** A severe or prolonged uncontrolled release represents a credible significant-degradation scenario.	Engineering confirmation of emergency containment, overflow, backup and plant-failure arrangements before operation. Emergency planning must explicitly prevent or minimize release to Graeme Hall and connected

Project Activity / Pressure	KBF(s) Affected	Impact Pathway / Potential Effect	Existing ESIA/ESMP Mitigation	Vulnerability / Irreplaceability	Magnitude	Extent	Duration	Reversibility	Likelihood	Cumulative Context	Residual Significance	Significant Conversion / Degradation?	Additional CHA Measure / Requirement
													drainage/coastal pathways.
Artificial Lighting During Construction and Operation	**KBF 3** – Migratory/congregatory birds; **KBF 4** – Endemic/range-restricted birds; other nocturnal fauna	Light spill into adjoining habitat could alter behavior, movement or habitat use and cause localized disturbance/ displacement.	Directional fixtures, shielding and lighting controls.	**High**	**Low**	Localized Project–wetland interface.	Short-term during construction; long-term during operation.	Reversible through modification/removal of lighting.	**Possible** without controls; **Unlikely** with low-spill design.	Existing urban and SCSTP lighting already contributes to baseline disturbance.	**Low**	**No**	Confirm low-spill lighting design at wetland interface; orient lighting away from wetland; use shielding and minimum illumination necessary for safety/security; inspect night-time light spill and correct where required.
Construction Noise,	**KBF 3** and **KBF 4**;	Construction activity	Restriction/ manageme	**High**	**Low**	Localized.	Short-term.	Reversible once	**Likely** locally	Existing SCSTP,	**Low**	**No**	Maintain constructio

Project Activity / Pressure	KBF(s) Affected	Impact Pathway / Potential Effect	Existing ESIA/ESMP Mitigation	Vulnerability / Irreplaceability	Magnitude	Extent	Duration	Reversibility	Likelihood	Cumulative Context	Residual Significance	Significant Conversion / Degradation?	Additional CHA Measure / Requirement
Vibration and Human Activity	other wetland fauna	causes temporary behavioral disturbance or displacement from habitat near the Project interface.	nt of nuisance-generating activities; equipment and work-hour controls.					activity ceases.	during active construction, although ecological response may vary.	roads and surrounding development already generate anthropogenic disturbance.			n activities within approved areas/hours; avoid unnecessary high-disturbance activity adjacent to wetland margins; apply targeted timing restrictions if sensitive breeding/roosting activity is identified during works.
Drainage Modification / Change in Hydrological Regime	**KBF 1** – Ramsar ecological character; **KBF 2** – Hydrologic	Altered drainage, water quantity, inundation, water quality	Drainage-management/design measures in ESIA/ESMP.	**Very High**	**Potentially High** if material hydrol	Functional ecological/ hydrological area.	Long-term.	Potentially difficult to reverse where ecological/ hydrologic	**Possible**, depending on final design	Existing hydrological alteration and constrain	**Low–Medium**, provided advers	**No**, provided no material adverse alteration	Demonstrate through design review that the Project will not

Project Activity / Pressure	KBF(s) Affected	Impact Pathway / Potential Effect	Existing ESIA/ESMP Mitigation	Vulnerability / Irreplaceability	Magnitude	Extent	Duration	Reversibility	Likelihood	Cumulative Context	Residual Significance	Significant Conversion / Degradation?	Additional CHA Measure / Requirement
	al/ecological processes; indirectly KBFs 3, 4 and 6	or salinity changes wetland ecological processes and habitat condition.			ogical alteration occurs; **Low** where hydrological function is maintained.			al change becomes established.	and operational configuration.	ed wetland–sea exchange make the system particularly sensitive to additional change.	e hydrological change is avoided and monitored.	occurs. **Potentially Yes** if Project-related change substantially and persistently impairs hydrological processes necessary to maintain Critical Habitat.	materially adversely alter wetland hydrological function. Confirm function/configuration of drainage/outflow pipes and sluice management arrangements. Establish hydrological/water-quality indicators sufficient to identify material Project-related change.
Change In Existing	**KBF 2** – Hydrologic	Change or cessation of	Operational water-	**High–Very**	**Low–Moder**	Southern wetland	Long-term.	Potentially reversible	**Possible**	Existing sluice	**Low–Mediu**	**Not presentl**	Confirm future

Project Activity / Pressure	KBF(s) Affected	Impact Pathway / Potential Effect	Existing ESIA/ESMP Mitigation	Vulnerability / Irreplaceability	Magnitude	Extent	Duration	Reversibility	Likelihood	Cumulative Context	Residual Significance	Significant Conversion / Degradation?	Additional CHA Measure / Requirement
Downstream Wastewater Conveyance / Coastal Discharge Pathway	al/ecological processes; **KBF 5** – Connected coastal/marine habitats; potentially KBF 6	the existing SCSTP southward conveyance/ discharge route alters water quantity/quality reaching the southern wetland or coastal environment; accidental releases may also be transported downstream.	quality/discharge controls and Project water-reuse arrangements.	**High**	**ate**, subject to final configuration and actual ecological dependence on the pathway.	interface to downstream coastal environment.		through operational adjustment; ecological response may be slower.	because the Project intentionally changes existing water-management arrangements.	appears inoperable; wetland–coastal exchange is already impaired. Existing SCSTP outflow infrastructure currently follows this route.	**m / Uncertain pending technical confirmation**	**y indicated.** Insufficient evidence that the planned change would cause significant degradation, but the pathway requires confirmation.	function/configuration of existing outflow pipes and the implications of cessation/change in existing discharge. Confirm sluice operational/management status. Assess whether changes materially affect wetland water balance or downstream coastal water quality before final

Project Activity / Pressure	KBF(s) Affected	Impact Pathway / Potential Effect	Existing ESIA/ESMP Mitigation	Vulnerability / Irreplaceability	Magnitude	Extent	Duration	Reversibility	Likelihood	Cumulative Context	Residual Significance	Significant Conversion / Degradation?	Additional CHA Measure / Requirement
													operational arrangements are confirmed.
Existing Environmental Pressures + Project Pressures (Cumulative)	**All KBFs**, principally KBF 1 and KBF 2	Incremental Project pressures interact with existing hydrological alteration, urban runoff, wastewater influence, habitat disturbance, dumping and hurricane-related damage, reducing ecological resilience or contributing to progressive degradation.	Existing ESMP measures across water quality, drainage, waste, pollution prevention and biodiversity management.	**Very High**	**Low–Moderate incremental Project contribution**, provided mitigation is effective.	Wetland system / functional ecological area.	Long-term.	Variable; some cumulative ecological changes may be difficult to reverse.	**Possible** if Project controls are ineffective or hydrological changes compound existing stress.	**High relevance.** Field verification confirmed existing urban runoff, infrastructure influence, localized dumping, hurricane damage and impaired coastal exchange while finding the accessible wetland overall in	**Low–Medium** with effective controls and monitoring.	**No**, based on currently identified Project pathways and proposed controls. Could contribute to significant degradation if substantial Project-related hydrological or pollution pressures are	Integrate Critical Habitat indicators into Project monitoring; distinguish Project-related change from baseline pressures where practicable; establish thresholds/triggers for investigation and corrective action; apply adaptive manageme

Project Activity / Pressure	KBF(s) Affected	Impact Pathway / Potential Effect	Existing ESIA/ESMP Mitigation	Vulnerability / Irreplaceability	Magnitude	Extent	Duration	Reversibility	Likelihood	Cumulative Context	Residual Significance	Significant Conversion / Degradation?	Additional CHA Measure / Requirement
										Moderate –Good condition.		allowed to persist cumulatively.	nt where adverse trends are detected.

Overall finding: The assessment does not identify any Project activity that, following implementation of existing ESIA/ESMP controls and the additional CHA requirements identified above, is predicted to result in significant conversion or degradation of Graeme Hall Critical Habitat. Direct conversion of Ramsar wetland or mangrove habitat is not anticipated. The principal residual risks arise from indirect hydrological and water-quality pathways, particularly construction runoff, changes to drainage or wastewater conveyance, and accidental/emergency releases. These risks are considered capable of being avoided or reduced to acceptable residual levels through appropriate design, construction controls, operational safeguards and monitoring. A material, sustained adverse alteration of wetland hydrology or water quality, or a substantial uncontrolled wastewater/pollution release, would however represent a potential significant-degradation scenario and should therefore be subject to explicit prevention, monitoring and adaptive-management requirements.

Annex F. Critical Habitat Mitigation, Monitoring and Follow-up Action Matrix

Rapid Critical Habitat Assessment

Critical Habitat Mitigation, Monitoring and Follow-up Action Matrix

Table 208 presents the critical habitat mitigation, monitoring and follow-up action matrix.

Table** 208**: Critical habitat mitigation, monitoring and follow-up action matrix

KBF / Risk	Required Measure	Mitigation Hierarchy	Existing ESIA/ESMP Provision	Additional CHA Requirement	Responsible Party	Timing	Monitoring / Verification
KBF 1 – Wetland/Mangrove Habitat: Construction Encroachment	Maintain all Project construction activities outside Ramsar wetland, mangrove, marsh and associated wetland habitat and clearly demarcate no-go areas.	**Avoid**	No wetland clearing; localized development and construction-area controls.	Confirm final construction footprint and no-go boundaries before works. Prohibit unauthorized access, storage, spoil disposal, equipment placement or temporary works within wetland habitat.	Contractor / BWA	Pre-construction and construction	Pre-construction boundary verification; routine boundary inspection; photographic records; incident/non-compliance reporting and corrective action.
KBF 6 – Conservation-Priority Flora: Vegetation Clearance	Minimize vegetation clearance and avoid impacts to conservation-priority flora at the Project interface where practicable.	**Avoid / Minimize**	Vegetation and construction-footprint management measures.	Identify conservation-priority vegetation within areas proposed for clearance before works, including confirmed lignum-vitae (*Guaiacum officinale*). Avoid where practicable; where avoidance is not feasible, determine appropriate management before removal.	Contractor / BWA / Environmental Specialist	Pre-construction and construction	Pre-clearance verification; records of plants retained/affected and management action; photographic verification.
KBFs 1 & 2 – Wetland	Prevent sediment-laden or contaminated	**Avoid / Minimize**	Silt traps; drainage, erosion	Confirm adequacy and placement of controls at the Project–wetland	Contractor	Pre-construction	Routine inspection of erosion/sediment

KBF / Risk	Required Measure	Mitigation Hierarchy	Existing ESIA/ESMP Provision	Additional CHA Requirement	Responsible Party	Timing	Monitoring / Verification
Habitat And Hydrological Processes: Construction Sediment/Runoff	construction runoff from entering the Eastern Marsh or other connected wetland drainage pathways.		and sediment-control measures.	interface and along pathways capable of conveying runoff toward the wetland. Controls to be installed before significant ground disturbance and maintained throughout works.		and construction	controls; inspections following significant rainfall; runoff/turbidity observations where warranted; maintenance and corrective-action records.
KBFs 1, 2 & 6 – Wetland Vegetation/Fauna: Fuel, Chemical And Contaminant Releases	Prevent and rapidly contain fuel, chemical and other contaminant releases capable of reaching wetland habitat or drainage pathways.	**Avoid / Minimize**	Chemical/fuel storage, bunding, waste-management and spill-response requirements.	Locate hazardous-material storage/refueling away from wetland margins and connected drainage pathways. Ensure response arrangements specifically recognize Graeme Hall as Critical Habitat and provide for immediate containment and notification of releases capable of reaching the wetland.	Contractor / BWA	Construction and operation, as applicable	Storage/containment inspections; spill and incident records; response documentation; corrective-action verification.
KBFs 1 & 2 – Wetland Ecological Character and Hydrological Processes: Routine Wastewater/Reclaimed-Water Management	Ensure final wastewater and reclaimed-water arrangements do not materially adversely alter wetland water quantity, water quality, salinity, drainage or ecological functioning.	**Avoid / Minimize**	Operational treatment, water-quality, drainage and reclaimed-water management provisions.	Confirm the final operational configuration and demonstrate that changes from the existing wastewater-management arrangement will not materially adversely alter hydrological or water-quality conditions supporting Graeme Hall.	BWA / Design Team / Operator	Detailed design / pre-operation / operation	Design and operational verification; relevant flow/discharge records; water-quality and hydrological monitoring; review of trends against baseline/reference conditions.
KBFs 1 & 2 – Wetland Hydrology:	Avoid material adverse alteration of drainage, water balance,	**Avoid / Minimize**	Drainage-management and design provisions.	Verify that final drainage design maintains wetland hydrological function. Any subsequent design	BWA / Design Team / Engineering	Detailed design / pre-construction	Design review/technical verification;

KBF / Risk	Required Measure	Mitigation Hierarchy	Existing ESIA/ESMP Provision	Additional CHA Requirement	Responsible Party	Timing	Monitoring / Verification
Drainage Modification	inundation, salinity or hydrological connectivity supporting Critical Habitat.			change capable of materially altering drainage, discharge, groundwater interaction or wetland water balance should be reviewed for Critical Habitat implications before implementation.	Team	and when relevant design changes occur	inspection of constructed drainage; hydrological and water-quality indicators sufficient to identify material Project-related change.
KBFs 2 & 5 – Wetland–Coastal Connectivity: Existing Outflow/Coastal Pathway	Ensure changes to existing downstream conveyance arrangements do not cause material adverse effects on wetland hydrology or connected coastal receptors.	**Avoid / Minimize**	Existing wastewater conveyance/discharge and Project water-reuse provisions.	Confirm the **function and future configuration of existing drainage/outflow infrastructure**, including infrastructure observed at the Eastern Marsh and existing SCSTP conveyance route. Confirm with **the MTW Drainage Unit the operational status and intended future arrangements for the sluice gate/coastal outlet.** Determine whether proposed changes could materially affect wetland water balance or downstream water quality.	BWA / Design & Engineering Team / Operator	Detailed design / before operation	Documented engineering/operational confirmation; design review; relevant flow/water-quality verification where required.
KBFs 1, 2, 3, 5 & 6 – Plant Failure/Overflow/Emergency Wastewater Release	Prevent untreated or inadequately treated wastewater from entering Graeme Hall or connected coastal pathways during plant failure, maintenance or emergency events.	**Avoid / Minimize**	Operational controls, emergency-response and plant-failure provisions.	Engineering confirmation that credible failure scenarios, including overflow, loss of treatment capacity, equipment failure, power interruption and maintenance events, can be contained or managed without substantial uncontrolled discharge to Critical Habitat.	BWA / Engineering Team / Operator	Detailed design / before operation and throughout operation	Engineering verification; emergency-procedure review/testing; operational and incident records; notification records; post-incident

KBF / Risk	Required Measure	Mitigation Hierarchy	Existing ESIA/ESMP Provision	Additional CHA Requirement	Responsible Party	Timing	Monitoring / Verification
				Emergency procedures should explicitly address Graeme Hall and connected downstream pathways.			environmental verification where a material release occurs.
KBFs 3 & 4 – Migratory/Congregatory and Resident Birds: Artificial Lighting	Minimize artificial light spill into adjoining wetland habitat.	**Minimize**	Directional fixtures, shielding and lighting controls.	Confirm low-spill lighting design at the wetland interface. Direct lighting away from wetland habitat and use shielding and the minimum illumination required for safety/security.	Contractor / BWA / Operator	Design, construction and operation	Design review; night-time inspection where warranted; corrective action where excessive spill is identified.
KBFs 3 & 4 – Wetland Birds/Fauna: Construction Noise and Activity	Minimize unnecessary noise, activity and disturbance adjacent to wetland habitat.	**Minimize**	Construction nuisance controls and working-hour requirements.	Maintain activities within approved areas/hours. Avoid unnecessary high-disturbance activities adjacent to wetland margins. Apply targeted temporary restrictions where significant nesting, roosting or other sensitive fauna activity is identified immediately adjacent to works.	Contractor	Construction	Routine site inspection; environmental observations; record and verification of any targeted temporary controls implemented.
Relevant KBF – Accidental Habitat Disturbance	Restore or rehabilitate habitat promptly where accidental disturbance occurs.	**Restore / Rehabilitate**	Site-restoration and reinstatement requirements.	Restoration measures should be proportionate to the affected KBF, habitat type and severity of disturbance and should seek to restore ecological condition/function rather than only physical appearance.	Contractor / BWA / Environmental Specialist	As required	Restoration plan/record where applicable; inspection; photographic verification; follow-up condition check sufficient to confirm establishment/recovery.
Principally KBFs 1 & 2 –	Verify that Project activities are not	**Monitor / Adaptive**	Existing water-quality, drainage	Integrate CHA-relevant parameters and locations into	BWA / Operator /	Construction and	Periodic review against

KBF / Risk	Required Measure	Mitigation Hierarchy	Existing ESIA/ESMP Provision	Additional CHA Requirement	Responsible Party	Timing	Monitoring / Verification
Critical Habitat Hydrology And Water Quality: Monitoring	causing material deterioration in hydrological or water-quality conditions supporting Graeme Hall.	**Management**	and environmental monitoring provisions.	existing Project monitoring rather than establish a parallel program. Monitoring should be capable of detecting material Project-related changes in relevant water-quality and hydrological conditions and identifying when investigation/corrective action is required.	Environmental Team	operation	baseline/reference conditions; trend analysis; investigation of material adverse changes; documented corrective/adaptive-management action.
All Relevant KBFs – Cumulative Pressures and Ecological Condition	Prevent Project-related pressures from materially adding to existing hydrological, water-quality and habitat stress or reducing ecological resilience.	**Avoid / Minimize / Adaptive Management**	Existing biodiversity and environmental monitoring and ESMP controls.	Review Project monitoring results in the context of existing pressures. Where practicable, distinguish Project-related changes from wider baseline variation and investigate adverse trends plausibly linked to the Project.	BWA / Operator / Environmental Team	Construction and operation	ESMP/CHA monitoring reports; periodic trend review; incident and corrective-action records; adaptive-management actions where trigger conditions are identified.
All Relevant KBFs – Material Project Change / New Impact Pathway	Review biodiversity implications where subsequent Project changes introduce an impact pathway not assessed by the CHA.	**Avoid / Follow-up**	Project change-management/environmental review procedures, as applicable.	Undertake targeted Critical Habitat review before implementing any material change involving new wetland footprint, altered drainage/water-management arrangements, new discharge pathways or another credible pathway capable of materially changing the CHA conclusions or required mitigation.	BWA / Design Team / Environmental Specialist	Before relevant Project change is approved/implemented	Documented change review; additional targeted technical/ecological assessment only where necessary; incorporation of resulting requirements into design/ESMP.

Annex G. Field Verification Photographic Record

Photographic record

Site visit photographic annex

Table 209 presents the field verification photographic record details.

Table** 209**: Field verification photographic record details

Project ref.	Barbados Climate Resilient South Coast Water Reclamation Project and Reuse Facilities *(Project Number: 5908/OC-BA/BA-L1063*	**Photographer**	Tracy Phillips Gregory Franklin Katherine Blackman
Site name	Graeme Hall Swamp and Surrounding Area	**Camera / device**	Cellular Phone
Parish / district	Christ Church	**Datum (default WGS 84)**	Yes
Date(s) of visit	21 August 2026 24 August 2026 28 August 2026	**Total photographs**	

Stations: FV-01 – SCSTP / Project Interface · FV-02 – Eastern Marsh · FV-03 – Upper Drainage · FV-04 – Bisecting Canal · FV-05 – Nature Sanctuary · FV-06 – Southern Wetland Interface · FV-07 – Sluice Gate / Coastal Connection

Category codes: A Project Site · B Natural Habitat · C Flora and Vegetation · D Fauna · E Built Environment · F Existing Impacts and Hazards



Photo 1	*Project Interface East of the current Plant –Lignum-vitae Tree of Life (Guaiacum officinale)*

GPS: 13°04'19.4"N 59°34'18.6"W	**Date / time: 21 Aug**	**Facing: North**	**Station: FV-01:SCSTP / Project Interface**	**Category: C - flora and vegetation**



Photo 2	*Project Interface in front of the current Plant– Mahogany Tree (Swietenia mahagoni)*

GPS: 13°04'19.4"N 59°34'20.4"W	**Date/time: 28 Aug**	**Facing: West**	**Station: FV-01: SCSTP / Project Interface**	**Category: C - flora and vegetation**



Photo 3	*Project Interface: Western Boundary of the Site for the new Water Reclamation Facility, current Sewage Treatment Plant (left)*			
GPS: 13°04'22.7"N 59°34'22.0"W	**Date / time: 21 Aug**	**Facing: East**	**Station: FV-01 SCSTP / Project Interface**	**Category: A – Project site**



Photo 4	*Project Interface: Site for the new Water Reclamation Facility*			
GPS: 13°04'22.7"N 59°34'22.0"W	**Date/time: 21 Aug**	**Facing: Northeast**	**Station: FV-01 SCSTP / Project Interface**	**Category: A – Project Site**



Photo 5	*Project Interface: Site for the new Water Reclamation Facility – Shade cloth being used for dust mitigation*			
GPS: 13°04'22.7"N 59°34'22.0"W	**Date/time: 21 Aug**	**Facing: East**	**Station: FV-01 SCSTP / Project Interface**	**Category: A – Project site**



Photo 6	*Project Interface Western Boundary Jamaica Caper Quadrella cynophallophora (formerly part of the Capparis genus).*			
GPS: n/a	**Date/time: 21 Aug**	**Facing: Southwest**	**Station: FV-01 SCSTP / Project Interface**	**Category: C - flora and vegetation**



Photo 7	*Project Interface Western Boundary Wireweed/Broomweed (Sida acuta)*			
GPS: n/a	**Date/time: 21 Aug**	**Facing: Southwest**	**Station: FV-01 SCSTP / Project Interface**	**Category: C - flora and vegetation**



Photo 8	*Project Interface Southwest Boundary– River Tamarind (Leucaena leucocephala)*			
GPS: n/a	**Date/time: 21 Aug**	**Facing: Southwest**	**Station: FV-01 SCSTP / Project Interface**	**Category: C - Flora and Vegetation**



Photo 9	*Project Interface – Natural Gully to the East of the Project Site*			
GPS: 13°04'19.4"N 59°34'18.6"W	**Date/time: 24 Aug**	**Facing: East**	**Station: FV-01 SCSTP / Project Interface**	**Category: B - Natural Habitat**



Photo 10	*Project Interface Cattle Egret (Ardea ibis, formerly Bubulcus ibis)*			
GPS: n/a	**Date/time: 28 Aug**	**Facing: n/a**	**Station: FV-01 SCSTP / Project Interface**	**Category: D - Fauna**



Photo 11	*Eastern Marsh – Southeast of the South Coast Sewage Treatment Plant*			
GPS: 13.00702090, -59.5770550	**Date/time: 21 Aug**	**Facing: West**	**Station: FV-02 Eastern Marsh**	**Category: B - Natural Habitat**



Photo 12	*Eastern Marsh – Sedge/Rush (Eleocharis mutata)*			
GPS: 13.00702090, -59.5770550	**Date / time: 21 Aug**	**Facing: West**	**Station: FV-02 Eastern Marsh**	**Category: B - Natural Habitat**



Photo 13	*Eastern Marsh – Southeast of the South Coast Sewage Treatment Plant*			
GPS: 13.00702090, -59.5770550	**Date / time: 21 Aug**	**Facing: West**	**Station: FV-02 Eastern Marsh**	**Category: B - Natural Habitat**

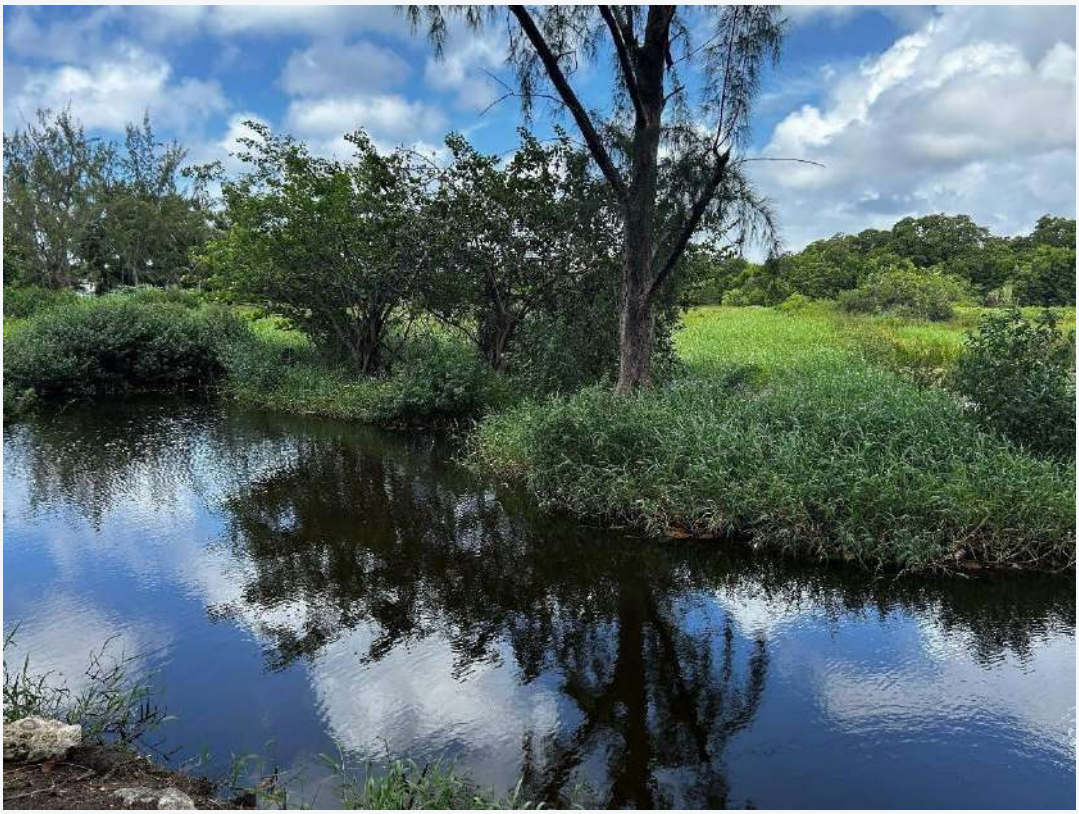


Photo 14	*Eastern Marsh – Southeast of the South Coast Sewage Treatment Plant*			
GPS: 13.00702090, -59.5770550	**Date / time: 21 Aug**	**Facing: West**	**Station: FV-02 Eastern Marsh**	**Category: B - Natural Habitat**



Photo 15	*Surface water drainage from Harmony Hall (urban environment) discharging into the swamp as part of flood mitigation*			
GPS: GPS: 13°04'14.6"N 59°34'21.4"W	**Date / time: 21 Aug**	**Facing: n/a**	**Station: FV-02 Eastern Marsh**	**Category: E – Built Environment**



Photo 16	*Eastern Marsh – Water Coloration*			
GPS: 13.00702090, -59.5770550	**Date/time: 21 Aug**	**Facing: n/a**	**Station: FV-02 Eastern Marsh**	**Category: B - Natural Habitat**



Photo 17	*Eastern Marsh – White Butterfly Great Southern White (Ascia monuste)*			
GPS:	**Date/time: 21 Aug**	**Facing: n/a**	**Station: FV-02 Eastern Marsh**	**Category: D - Fauna**



Photo 18	*Eastern Marsh – Little Yellow Butterfly (Eurema Lisa)*			
GPS: n/a	**Date / time: 21 Aug**	**Facing: n/a**	**Station: FV-02 Eastern Marsh**	**Category: D - Fauna**



Photo 19	*Eastern Marsh – Primrose Willow/Water Primroses (Ludwigia octovalvis)*			
GPS: n/a	**Date / time:21 Aug**	**Facing:**	**Station: FV-02 Eastern Marsh**	**Category: C - Flora and Vegetation**



Photo 20	*Eastern Marsh - Caster Bean/Oil Plant (Ricinus communis)*			
GPS: n/a	**Date / time:21 Aug**	**Facing: n/a**	**Station: FV-02 Eastern Marsh**	**Category: C - Flora and Vegetation**



Photo 21	*Eastern Marsh – Water Lettuce (Pistia stratiotes)*			
GPS: n/a	**Date/time: 21 Aug**	**Facing: n/a**	**Station: FV-02 Eastern Marsh**	**Category: C - Flora and Vegetation**



Photo 22	*Eastern Marsh – Water Hyacinth (Pontederia crassipes)*			
GPS: n/a	**Date/time: 21 Aug**	**Facing: n/a**	**Station: FV-02 Eastern Marsh**	**Category: C - Flora and Vegetation**



Photo 23	*Eastern Marsh – Duckweed (Spirodela polyrhiza)*			
GPS: n/a	**Date/time: 21 Aug**	**Facing: n/a**	**Station: FV-02 Eastern Marsh**	**Category: C - Flora and Vegetation**



Photo 24	*Surface water drainage from Bamboo Road (Urban environment) discharging into the swamp as part of flood mitigation*			
GPS: 13°04'13.8"N 59°34'29.6"W	**Date / time: 21 Aug**	**Facing: n/a**	**Station: FV-02 Eastern Marsh**	**Category: E – Built Environment**

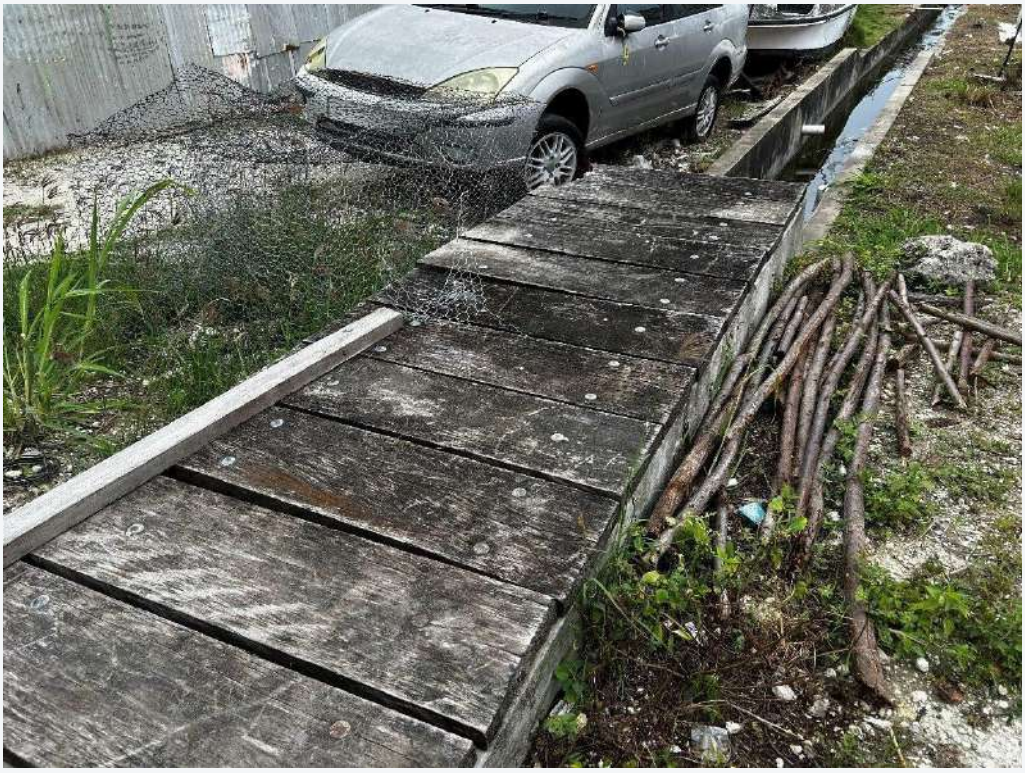


Photo 25	*Eastern Marsh – White Mangrove (Laguncularia racemosa wood used by fisherman in the St. Lawrence area to make fishpots*			
GPS: 13°04'13.8"N 59°34'29.6"W	**Date / time: 21 Aug**	**Facing: n/a**	**Station: FV-02 Eastern Marsh**	**Category: F Existing Impacts and Hazards**



Photo 26	*Eastern Marsh - Napier Grass / Elephant Grass (Cenchrus purpureus, formerly Pennisetum purpureum)*			
GPS: n/a	**Date / time:21 Aug**	**Facing: n/a**	**Station: FV-02 Eastern Marsh**	**Category: C - Flora and Vegetation**



Photo 27	*Eastern Marsh – Illegal Dumping Old Mattress*			
GPS: 13°04'13.7"N 59°34'30.6"W	**Date / time:21 Aug**	**Facing: n/a**	**Station: FV-02 Eastern Marsh**	**Category: F Existing Impacts and Hazards**



Photo 28	*Eastern Marsh – Illegal Dumping Old Appliances*			
GPS: 13°04'13.7"N 59°34'30.6"W	**Date / time:21 Aug**	**Facing: n/a**	**Station: FV-02 Eastern Marsh**	**Category: F Existing Impacts and Hazards**



Photo 29	*Eastern Marsh – White Mangrove (Laguncularia racemosa). Damaged by Hurricane Beryl*			
GPS:13.070245, -59,575785	**Date / time: 21 Aug**	**Facing: West**	**Station: FV-02 Eastern Marsh**	**Category: C - Flora and Vegetation**



Photo 30	*Upper Drainage – Mature red (Rhizophora mangle) and White mangroves (Laguncularia racemosa), dense vegetation*			
GPS:13.070245, -59,575785	**Date/time: 24 Aug**	**Facing: North**	**Station: FV-03 Upper Drainage**	**Category: C - Flora and Vegetation; B - Natural Habitat**



Photo 31	*Upper Drainage – Mature red (Rhizophora mangle) and White mangroves (Laguncularia racemosa), dense vegetation*			
GPS:13.070245, -59,575785	**Date/time: 24 Aug**	**Facing: North**	**Station: FV-03 Upper Drainage**	**Category: C - Flora and Vegetation; B - Natural Habitat**



Photo 32	*Upper Drainage – Fallen White mangroves (Laguncularia racemosa) from the passage of Hurricane Beryl*			
GPS: 13.070245, -59,575785	**Date/time: 28 Aug**	**Facing: East**	**Station: FV-03 Upper Drainage**	**Category: C - Flora and Vegetation; B - Natural Habitat**



Photo 33	*Upper Drainage – Fallen Red mangroves (Rhizophora mangle) from the passage of Hurricane Beryl.*			
GPS:	**Date / time: 28 Aug**	**Facing: West**	**Station: FV-03 Upper Drainage**	**Category: C - Flora and Vegetation; B - Natural Habitat**



Photo 34	*Upper Drainage Sour Bush (Pluchea carolinensis)*			
GPS:13.070176, -59,577093	**Date/time: 28 Aug**	**Facing: n/a**	**Station: FV-03 Upper Drainage**	**Category: B - Natural Habitat**



Photo 35	*Upper Drainage Standing Water - Tannins Visible*			
GPS:13.070176, -59,577093	**Date/time: 28 Aug**	**Facing: n/a**	**Station: FV-03 Upper Drainage**	**Category: B - Natural Habitat**



Photo 36	*Bisecting Canal – Red Mangrove (Rhizophora mangle)*			
GPS:13.070176, -59,577093	**Date/time: 21 Aug**	**Facing: South**	**Station: FV-04 – Bisecting Canal**	**Category: B - Natural Habitat**



Photo 37	*Bisecting Canal – Red Mangrove (Rhizophora mangle) & Duckweed*			
GPS:13.070176, -59,577093	**Date/time: 21 Aug**	**Facing: Northwest**	**Station: FV-04 – Bisecting Canal**	**Category: B - Natural Habitat**



Photo 38	*Bisecting Canal – Fallen Red Mangrove (Rhizophora mangle)*			
GPS:13.070176, -59,577093	**Date / time: 21 Aug**	**Facing: West**	**Station: FV-04 – Bisecting Canal**	**Category: C - Flora and Vegetation**



Photo 39	*Bisecting Canal – Red Mangrove (Rhizophora mangle)*			
GPS:13.070176, -59,577093	**Date / time: 21 Aug**	**Facing: West**	**Station: FV-04 – Bisecting Canal**	**Category: C - Flora and Vegetation**



Photo 40	*Bisecting Canal – Swamp Flatsedge (Cyperus ligularis)*			
GPS: n/a	**Date / time: 24 Aug**	**Facing: n/a**	**Station: FV-04 – Bisecting Canal**	**Category: C - Flora and Vegetation**



Photo 41	*Bisecting Canal – Sour Bush (Pluchea carolinensis)*			
GPS:	**Date / time: 24 Aug**	**Facing: East**	**Station: FV-04 – Bisecting Canal**	**Category: C - Flora and Vegetation**



Photo 42	*Bisecting Canal – White Mangrove (Laguncularia racemosa)*			
GPS:	**Date/time: 24 Aug**	**Facing: East**	**Station: FV-04 – Bisecting Canal**	**Category: C - Flora and Vegetation**



Photo 43	*Bisecting Canal – Spanish needles (Bidens alba)*

GPS:	**Date / time:24 Aug**	**Facing: n/a**	**Station: FV-04 – Bisecting Canal**	**Category: C - Flora and Vegetation**



Photo 44	*Bisecting Canal – Bushy lippia (Lippia alba)*

GPS: n/a	**Date/time: 28 Aug**	**Facing: n/a**	**Station: FV-04 – Bisecting Canal**	**Category: C - Flora and Vegetation**



Photo 45	*Bisecting Canal – Cattle bush (Trichodesma zeylanicum)*			
GPS: n/a	**Date/time: 28 Aug**	**Facing: East**	**Station: FV-04 – Bisecting Canal**	**Category: C - Flora and Vegetation**



Photo 46	*Bisecting Canal – Tropical buckeye (Junonia evarete) butterflies*			
GPS:	**Date / time:24 Aug**	**Facing: n/a**	**Station: FV-04 – Bisecting Canal**	**Category: D - Funa**



Photo 47	*Bisecting Canal – Widow skimmer (Libellula luctuosa) dragonfly*			
GPS:	**Date / time:24 Aug**	**Facing: n/a**	**Station: FV-04 – Bisecting Canal**	**Category: D - Funa**

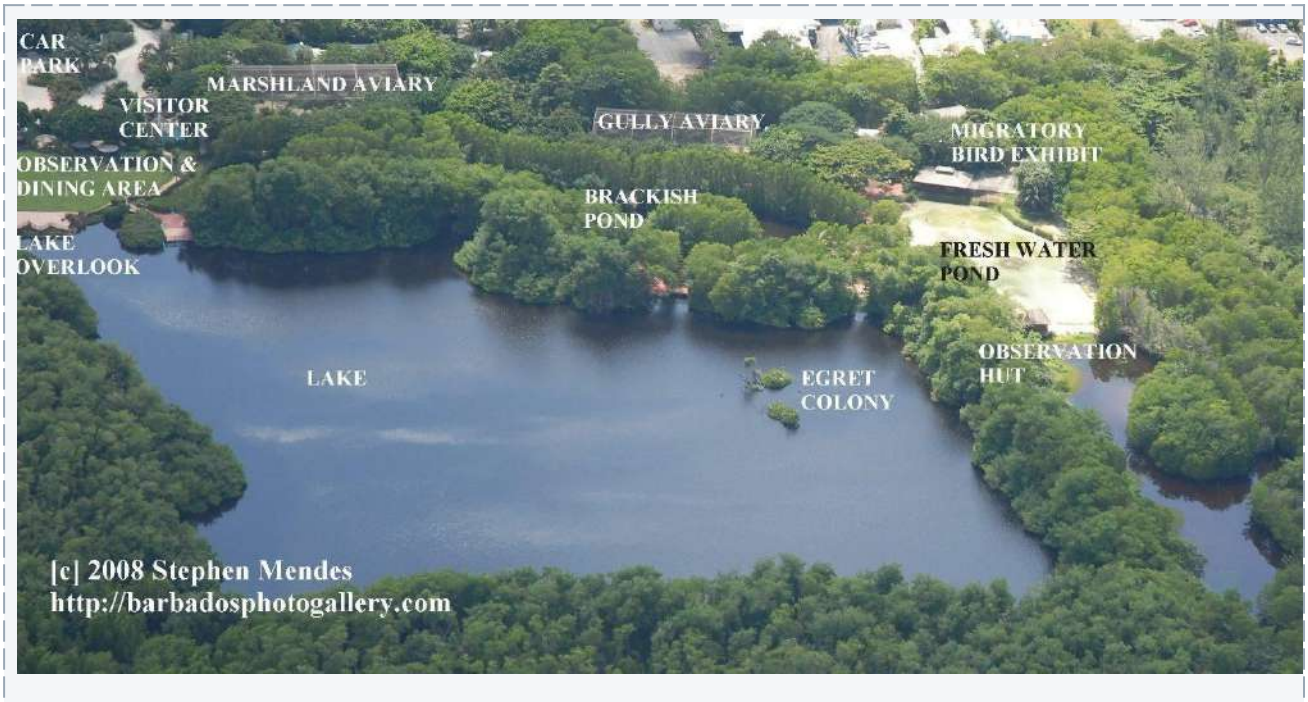


Photo 48	*Graeme Hall Nature Sanctuary Layout – Stock Photo from Literature*			
GPS: n/a	**Date/time: 2008**	**Facing: Aerial View**	**Station: FV-05 – Nature Sanctuary**	**Category: n/a**



Photo 49	*FV-06 – Southern Wetland Interface – Intersection of the Swamp with Highway 7*			
GPS: 13°04'11.4"N 59°34'38.0"W	**Date/time: Aug 21**	**Facing: South**	**Station: FV-06 – Southern Wetland Interface**	**Category: E Built Environment; F Existing Impacts and Hazards**



Photo 50	*FV-06 – Southern Wetland Interface – SCSTP Outflow Pipe*			
GPS:13°04'11.4"N 59°34'38.0"W	**Date/time: 21 Aug**	**Facing: South**	**Station: FV-06 – Southern Wetland Interface**	**Category: F Existing Impacts and Hazards**



Photo 51	*FV-06 – Southern Wetland Interface SCSTP Outflow Pumping Station (2 present in the area)*			
GPS: 13°04'11.4"N 59°34'38.0"W	**Date/time: 21 Aug**	**Facing: South**	**Station: FV-06 – Southern Wetland Interface**	**Category: E Built Environment; F Existing Impacts and Hazards**



Photo 52	*FV-06 – Southern Wetland Interface - SCSTP Outflow Pump (2 present in the area)*			
GPS: 13°04'11.4"N 59°34'38.0"W	**Date/time: 24 Aug**	**Facing: n/a**	**Station: FV-06 – Southern Wetland Interface**	**Category: E Built Environment;**



Photo 53	*FV-06 – Southern Wetland Interface – SCSTP Outflow Pipe branches into two under bridge and into the channel on Sandy Beach*			
GPS: 13°04'10.2"N 59°34'38.3"W	**Date/time: 24 Aug**	**Facing: Southwest**	**Station: FV-06 – Southern Wetland Interface**	**Category: E Built Environment; F Existing Impacts and Hazards**



Photo 54	*FV-06 – Southern Wetland Interface – SCSTP Outflow Pipes continue through the channel at Sandy Beach*			
GPS: 13°04'10.2"N 59°34'38.3"W	**Date/time: 24 Aug**	**Facing: Northwest**	**Station: FV-06 – Southern Wetland Interface**	**Category: E Built Environment; F Existing Impacts and Hazards**



Photo 55	*Sluice Gate – Beach Erosion*			
GPS: 13°04'09.5"N 59°34'38.7"W	**Date/time: 28 Aug**	**Facing: South**	**Station: •FV-07 – Sluice Gate / Coastal Connection**	**Category: E Built Environment; F Existing Impacts and Hazards**



Photo 56	*Sluice Gate*			
GPS: 13°04'09.5"N 59°34'38.7"W	**Date/time: 21 Aug**	**Facing: South**	**Station: FV-07 – Sluice Gate / Coastal Connection**	**Category: E Built Environment; F Existing Impacts and Hazards**



Photo 57	*Water Channel leading to the Sluice Gate*			
GPS: 13°04'09.5"N 59°34'38.7"W	**Date/time: 21 Aug**	**Facing: North**	**Station: FV-07 – Sluice Gate / Coastal Connection**	**Category: E Built Environment**



Photo 58	*Sluice Gate - Debris in the water channel*			
GPS: 13°04'09.5"N 59°34'38.7"W	**Date/time:21 Aug**	**Facing: n/a**	**Station: FV-07 – Sluice Gate / Coastal Connection**	**Category: E Built Environment; F Existing Impacts and Hazards**



Photo 59	*Sluice Gate- Outflow from the sewage plant culminates here and heads offshore*			
GPS: 13°04'09.5"N 59°34'38.7"W	**Date/time: 21 Aug**	**Facing: South**	**Station: FV-07 – Sluice Gate / Coastal Connection**	**Category: E Built Environment; F Existing Impacts and Hazards**

Annex H. Environmental and Social Commitments Register

This register converts the commitments and mitigation measures in this assessment into auditable implementation requirements. For each commitment it records the applicable Environmental and Social Performance Standard, the party accountable for implementing it, the point at which it must be complete, the monitoring and reporting that attaches to it, the evidence that demonstrates compliance, and the criteria on which it is closed together with the party that verifies closure.

Its purpose is to let the Borrower and the Bank supervise implementation from a single instrument, and to remove the scope for differing interpretations of what a commitment requires during construction and operation. The register is the controlling record of commitment status. It is updated whenever a commitment is closed, whenever the review provisions change a commitment, and whenever the updated Critical Habitat Assessment adds one, and its status is reported in the semi-annual compliance report to the Bank.

References to Performance Standards are to the Inter-American Development Bank Environmental and Social Performance Standards, given by number. Standard 1 is assessment and management of environmental and social risks and impacts, Standard 2 labor and working conditions, Standard 3 resource efficiency and pollution prevention, Standard 4 community health, safety and security, Standard 5 land acquisition and involuntary resettlement, Standard 6 biodiversity conservation and sustainable management of living natural resources, Standard 8 cultural heritage, Standard 9 gender equality, and Standard 10 stakeholder engagement and information disclosure.

Table 210 presents the environmental and social commitments register.

Table** 210**: Environmental and Social Commitments Register

Ref	Commitment or mitigation measure	ESPS	Responsible implementing party	Timing and completion milestone	Monitoring and reporting requirement	Evidence required to demonstrate compliance	Closure criteria and verification responsibility
C-01	Update the wetland risk assessment and the Critical Habitat impact assessment against the final design	1, 6	Project Execution Unit with the ecological specialist	Before construction begins	Progress reported in the semi-annual report to the Bank	Updated assessment report stating whether the conclusion of no significant conversion or degradation remains valid	Accepted by the Project Execution Unit and disclosed to the Bank; verified by the Bank

Ref	Commitment or mitigation measure	ESPS	Responsible implementing party	Timing and completion milestone	Monitoring and reporting requirement	Evidence required to demonstrate compliance	Closure criteria and verification responsibility
C-02	Close out every gate condition before the activity it governs	1	Contractor, countersigned by the verifier named against each condition	Before the governed activity, and again on any material design or method change	Gate register status in every monthly performance report	Gate condition close-out record countersigned by the named verifier	All conditions closed; verified by the Project Execution Unit as holder of the gate register
C-03	Operate the consolidated monitoring program with its indicators, thresholds and verification records	1	Contractor; verified by AECOM, the Project Execution Unit and the Barbados Water Authority as assigned	From mobilization, continuing through the operation assistance period ending 14 May 2032	Monthly performance report; quarterly to the regulators; semi-annually to the Bank	Certificates of analysis, inspection checklists and monitoring records held in the indexed register	No overdue corrective actions and no unrecorded action-level results at the annual independent audit
C-04	Maintain the non-conformance register and close corrective actions through the verifying party	1	Contractor Health, Safety and Environment Manager	Continuous from mobilization	Register movement reported in every monthly performance report	Non-conformance register with dated entries and the closure evidence identified	Each entry closed on evidence by the authority set for its classification
C-05	Complete the actions that close the baseline information gaps	1	Contractor for the physical and chemical actions; SAEDI Consulting for the social survey and Sanctuary access	Before mobilization, before the 2027 wet season, or as stated against each action	Status reported in every monthly performance report until complete	Sampling records, survey dataset and dated field records	Each gap recorded as closed, with the affected findings requalified where the results require

Ref	Commitment or mitigation measure	ESPS	Responsible implementing party	Timing and completion milestone	Monitoring and reporting requirement	Evidence required to demonstrate compliance	Closure criteria and verification responsibility
C-06	Conduct internal, surveillance, compliance and independent audits	1	Contractor, AECOM, Project Execution Unit and the independent auditor	Quarterly, monthly, semi-annually and annually respectively	Audit reports at each level; annual audit report to the Bank	Audit reports with classified findings and their closure status	Findings from previous audits closed, or carried forward with a recorded reason
C-07	Apply the Labor Management Plan across the workforce, including subcontractor personnel	2	Contractor Human Resources	From first recruitment, continuing through the Project	Workforce register extract submitted monthly	Payroll, employment register and contracts of employment	Audit confirms terms, hours, wages and rest days meet the plan
C-08	Induct every worker on the Code of Conduct before first entry to site	2, 9	Contractor Health, Safety and Environment with Human Resources	Before first site entry for each person	Induction coverage reconciled monthly against the site access register	Induction register with signed acknowledgments of the Code of Conduct	Coverage at 100 percent at every monthly reconciliation
C-09	Operate a worker grievance channel independent of line management, with no retaliation	2	Contractor Human Resources with designated focal points	From mobilization	Worker grievances disaggregated and reported monthly	Worker grievance register and case files	Cases closed within the service standards; no substantiated instance of retaliation
C-10	Hold occupational noise exposure below 85 dB(A) over an 8-hour time-weighted average	2	Contractor Health, Safety and Environment Officer	Continuous from mobilization	Personal dosimetry monthly, and on any change of plant or method	Exposure records and the hearing protection issue register	No exposure above the action level left uncorrected at the next measurement

Ref	Commitment or mitigation measure	ESPS	Responsible implementing party	Timing and completion milestone	Monitoring and reporting requirement	Evidence required to demonstrate compliance	Closure criteria and verification responsibility
C-11	Meet the discharge standard for treated effluent at the plant outlet	3	Contractor process operator; verified by the Barbados Water Authority	From commissioning	Weekly through commissioning, monthly thereafter; quarterly to the regulators	Certificates of analysis with chain of custody	Twelve consecutive compliant monthly results in steady operation
C-12	Produce reclaimed water to the confirmed standard and hold every non-conforming batch	3	Contractor process operator; verified by the Barbados Water Authority with the Environmental Protection Department	From commissioning	Daily for operational parameters, monthly for the full suite	Reclaimed water quality log and non-conforming batch records	No non-conforming batch released to any point of use
C-13	Control the quality of stormwater discharged at the southeast outfall	3, 6	Contractor environmental officer; verified by AECOM	From the start of earthworks	Monthly in the dry season and after each design rainfall event in the wet season	Outfall sampling records and certificates of analysis	No exceedance left uncorrected; the gully pathway reassessed at the updated assessment
C-14	Install and maintain erosion and sediment controls before any ground disturbance	3, 6	Contractor environmental officer; verified by AECOM	Before any ground disturbance, as a gate condition	Weekly inspection, and within 24 hours after any rainfall event	Erosion and sediment control inspection checklists	No sediment observed beyond the control line at any inspection in the final quarter of earthworks
C-15	Segregate, store and transfer waste under manifest to approved facilities	3	Contractor environmental officer	From mobilization	Monthly reconciliation of the waste log against manifests and receipts	Waste log, waste manifests and receiving facility receipts	Every off-site transfer matched to a signed manifest and a receipt

Ref	Commitment or mitigation measure	ESPS	Responsible implementing party	Timing and completion milestone	Monitoring and reporting requirement	Evidence required to demonstrate compliance	Closure criteria and verification responsibility
C-16	Store hazardous materials with secondary containment at not less than 110 percent of capacity and segregate incompatible reagents	3, 4	Contractor Health, Safety and Environment Officer; verified by AECOM	Before any chemical is brought to site	Weekly inspection of every storage area	Hazardous materials checklists, chemical inventory and safety data sheet register	No loss of containment, and all storage compliant at the annual independent audit
C-17	Dewater and solar-dry sludge on site and dispose of or reuse it under the approved arrangements	3	Contractor process operator; verified by AECOM	From commissioning	Measurement and solids testing on every consignment	Waste manifests, sludge removal records and solids test certificates	Every consignment traced to an approved destination
C-18	Report purchased electricity, standby generation and solar output separately against the Contract carbon commitment	3	Project Execution Unit with the Contractor	Annually from commissioning, with the baseline established before commissioning	Annual report to the Bank and the Green Climate Fund	Energy and emissions account with the supporting monitoring results	Account accepted by the Bank, with the operational emissions baseline established
C-19	Operate one integrated Traffic and Pedestrian Management Plan across all three site areas, with school-sensitive transit windows	4	Contractor Site Supervisor; verified by AECOM and the Project Execution Unit	Adopted before full construction mobilization	Weekly speed checks; movement log kept daily and reconciled weekly	Movement logs, window reconciliation sheets and compliance check sheets	No movement within a restricted window and no injury collision in the reporting year

Ref	Commitment or mitigation measure	ESPS	Responsible implementing party	Timing and completion milestone	Monitoring and reporting requirement	Evidence required to demonstrate compliance	Closure criteria and verification responsibility
C-20	Hold ambient noise at residential receptors within 55 dB(A) daytime and 45 dB(A) at night	4	Contractor Health, Safety and Environment Officer; verified by the Project Execution Unit	From mobilization	Monthly, and within 48 hours of any noise grievance	Noise monitoring records and grievance response records	Exceedances corrected and confirmed by remeasurement
C-21	Suppress dust and hold particulates within the adopted limit at the site boundary	3, 4	Contractor environmental officer; verified by AECOM	From the start of earthworks	Continuous during earthworks and demolition, monthly thereafter	Air quality monitoring records and dust suppression logs	No visible dust reaching a residential receptor at any inspection
C-22	Deliver the Community Health Plan, covering vector control, disease surveillance and emergency preparedness	4	Contractor Health, Safety and Environment Officer with camp medical staff, coordinated with the Ministry of Health and Wellness	From site occupation	Weekly vector inspection; weekly illness recording; drills to schedule	Vector inspection records, larval surveys, camp health record and drill records	No outbreak unreported, and all scheduled drills completed
C-23	Adopt and implement the Sewage Spill Response Protocol recognizing Graeme Hall as Critical Habitat	4, 6	Contractor with the Barbados Water Authority and the Project Execution Unit	Adopted before construction, as a gate condition	Every activation recorded within 24 hours and notified immediately	Bypass activation records, incident reports and notification records	Protocol adopted and tested, and every activation investigated and closed
C-24	Keep the construction footprint outside wetland habitat and clear of the wetland margin	6	Contractor; verified by the Project Execution Unit	Continuous from site establishment	Monthly site inspection against the approved footprint	Site inspection records and the setting-out survey	No encroachment recorded at any inspection

Ref	Commitment or mitigation measure	ESPS	Responsible implementing party	Timing and completion milestone	Monitoring and reporting requirement	Evidence required to demonstrate compliance	Closure criteria and verification responsibility
C-25	Control lighting direction, shielding and intensity at the wetland-facing boundary, and time noisy activity to avoid sensitive periods	6	Contractor Site Engineer; verified by the ecological specialist	Before any night working begins	Monitoring under the Critical Habitat requirements at Annex F	Lighting design record and the Critical Habitat monitoring results	Effectiveness verified at the updated assessment
C-26	Determine whether a Biodiversity Action Plan is required	6	Project Execution Unit, in agreement with the Bank	On completion of the updated Critical Habitat Assessment	Reported in the semi-annual report to the Bank	Written determination recording the reasons	Determination recorded, and a plan prepared where the updated assessment requires one
C-27	Apply the Chance Find Procedure	8	Contractor Site Supervisor; verified by the Project Execution Unit	From first ground disturbance	Every find recorded and notified to the authority	Chance find records and authority notifications	No ground disturbance resumed at a find location before authority clearance
C-28	Prevent and respond to sexual exploitation, abuse, harassment and gender-based violence on a survivor-centered basis	9, 2	Trained focal point independent of line management; verified by the Project Execution Unit Social Management Specialist	Plan in force from mobilization	Every report acted on immediately; aggregated data reported monthly and to the Bank	Confidential case register, referral records and awareness session records	Every report handled to the protocol, confidentiality maintained and no retaliation substantiated

Ref	Commitment or mitigation measure	ESPS	Responsible implementing party	Timing and completion milestone	Monitoring and reporting requirement	Evidence required to demonstrate compliance	Closure criteria and verification responsibility
C-29	Monitor and report workforce composition and local content, disaggregated by sex, nationality, disability and vulnerability status	9, 2	Contractor Human Resources; verified by the Project Execution Unit	Monthly from mobilization	Monthly workforce register extract	Workforce register and recruitment records	Reporting complete for every month, with measures applied where disparities are detected
C-30	Operate the Grievance Redress Mechanism to the published service standards	10	Community Liaison Officer; verified by the Project Execution Unit Social Management Specialist	From mobilization	Monthly grievance statistics measured against the service standards	Grievance register, case files and closure records	Cases closed within standard, and those out of standard escalated and disclosed
C-31	Disclose monitoring performance to affected communities in plain language	10	Project Execution Unit through the Community Liaison Officer	Quarterly, and before any activity materially changing community exposure	Quarterly disclosure through the channels in the Stakeholder Engagement Plan	Town hall records, attendance registers and disclosure materials	Disclosure delivered each quarter, with feedback recorded and answered
C-32	Continue engagement with vulnerable and differentially affected groups and complete the household and community survey	10, 9	SAEDI Consulting with the Community Liaison Officer	Survey completed under the engagement program	Status reported in the monthly performance report until complete	Survey dataset and consultation records	Survey complete and the social baseline requalified against its results

Ref	Commitment or mitigation measure	ESPS	Responsible implementing party	Timing and completion milestone	Monitoring and reporting requirement	Evidence required to demonstrate compliance	Closure criteria and verification responsibility
C-33	Prepare and implement a Livelihood Restoration Plan for vendors affected by the pipeline corridor	5	Project Execution Unit under the Pipeline Environmental and Social Assessment and Management Plan	Completed and implemented before pipeline construction begins	Reported under the pipeline instrument	Livelihood Restoration Plan and its implementation records	Closed under the pipeline instrument. Recorded here so the commitment is not lost between the two documents
C-34	Issue the neighboring land and agricultural property requirements of the Code of Conduct (Section 8.4.8.6) to every worker in a language the worker reads, and obtain a signed acknowledgment	1, 4	Contractor Human Resources Representative, supported by the Project Manager	Before any worker takes up accommodation at the campsite or starts work, and on each subsequent mobilization	Coverage reported in every monthly performance report until all mobilized workers are covered	Signed acknowledgments held on the worker file, and the issued Standard Chinese text showing Section 8.4.8.6 in full	100 percent of mobilized workers hold a signed acknowledgment of a version containing Section 8.4.8.6; verified by the Project Execution Unit
C-35	Carry the prohibition on entry to neighboring farms and on taking crops, fruit or livestock into the camp rules, and verify compliance at the monthly camp inspection	1, 4	Contractor, with the camp rules agreed with the Project Execution Unit	Camp rules issued before first occupation; verification monthly thereafter	Inspection findings reported in the monthly performance report; grievances reported through the Grievance Redress Mechanism	Issued camp rules containing the prohibition, posted in English and Standard Chinese, and the dated monthly inspection log	Camp rules issued and posted, and twelve consecutive monthly inspections recorded; verified by the Project Execution Unit

How to read this register. Each row is one commitment, and it can be read across to answer the four questions a supervisor asks: who must do it, by when, how it is checked, and what proves it was done. The last column is the one that closes a commitment, and it names a verifier who is not the party delivering the commitment. A commitment stays open until its closure criteria are met on evidence, and the open commitments are reported every period until they are closed. Commitment C-33 is delivered under a different instrument and is recorded here so that it is not lost between the two documents.

Annex I. Townhall Records

Consultation evidence note: The documented Town Hall meetings took place on 23 September and 8 October 2026. The first meeting record describes mobilisation/site clearing as already underway, so the available record does not establish that all engagement preceded preparatory site activities. The advance notices issued by the Barbados Water Authority are listed in the disclosure record below. Dated evidence of publication on the BWA and IDB websites, and of the placement of printed copies eight days before the Town Hall, is held by the Barbados Water Authority and is not reproduced in this annex. The seven days stated in the consultation chronology refer to the written notice of 16 September 2026; the eight days refer to the placement of printed copies, which is part of the evidence held by the Barbados Water Authority. Until that evidence is provided, the eight-day placement is recorded as an outstanding disclosure item rather than a verified fact, and responsibility for closing it rests with the Barbados Water Authority.

Disclosure and community notification record. The Barbados Water Authority issued the following notices and information material to residents and business owners of Harmony Hall, Christ Church. Copies were provided by the Communications and Public Relations Officer of the South Coast Water Reclamation Project and accompany this annex.

17 June 2026 (Ref. PMO/SC-WRRP/2026/080): Community Update and Upcoming Project Activities. The letter advises of site preparation, deliveries, construction vehicle movements and temporary traffic management, and encloses Frequently Asked Questions on activities at the project site, dated 18 June 2026.

Community Liaison Officer Backgrounder No. 1: approved project information for Community Liaison Officers to use with the notification letter and the Frequently Asked Questions when answering questions from residents, businesses and farmers, with complaints referred to the Grievance Redress Mechanism.

3 September 2026 (Ref. PMO/SC-WRRP/2026/113): Community Update No. 3. The letter gives notice of site clearance within the camp and plant boundary, filling and construction of the temporary access road and construction of the workers' and management camp, with the Contractor's contact details and grievance hotline.

16 September 2026: Community Update No. 4. The letter invites residents and business owners to the Town Hall and public consultation of 23 September 2026 at Hawthorne Methodist Church, states that the consultation addresses the ESIA and ESMP, and gives the BWA and grievance contacts.

28 September 2026: Community Update No. 5. The letter reminds residents that the ESIA and ESMP remain available for review through a QR code and invites them to the virtual public consultation of 8 October 2026.

The record shows that residents were notified of preparatory activities on 17 June 2026 and of site clearance and camp construction on 3 September 2026, that the Town Hall was announced seven days in advance and the virtual consultation ten days in advance, and that site clearance was notified before the first Town Hall took place.

BWA notice of 17 June 2026: Community Update and Upcoming Project Activities

BARBADOS WATER AUTHORITY

GOVERNMENT OF BARBADOS
PINE COMMERCIAL ESTATE, THE PINE, ST MICHAEL, BB11103, BARBADOS
Tel: (246) 434-4200
Fax: (246) 228-0155

Our Ref: **PMO/SC-WRRP/2026/080**

Your Ref:

Date: June 17, 2026

Residents and Business Owners
Harmony Hall
Christ Church
Barbados

Dear Resident / Business Owner,

RE: SOUTH COAST WATER RECLAMATION PROJECT (SCWRP)
COMMUNITY UPDATE & UPCOMING PROJECT ACTIVITIES

The Barbados Water Authority (BWA) wishes to advise residents and businesses of upcoming activities associated with the South Coast Water Reclamation Project (SCWRP) within and around Harmony Hall, Christ Church, and surrounding areas to the project site.

The SCWRP is a BWA project financed by the Inter-American Development Bank (IDB) and the Green Climate Fund (GCF). It is designed to strengthen Barbados' water security, improve wastewater management and increase resilience to drought and climate change.

The project will upgrade the infrastructure associated with the South Coast Wastewater Treatment Plant and develop a new reclaimed water system for agricultural irrigation. Instead of discharging treated wastewater to the sea, reclaimed water will be used to help conserve Barbados' limited freshwater resources while supporting sustainable agriculture.

As part of the project's current activities, residents and businesses may notice:

- Site preparation and construction activities.
- Delivery of construction materials and equipment.
- Increased movement of project/construction vehicles.
- Temporary traffic management or short-term traffic delays.
- Increased contractor and workforce activity within the project area.

Measures are being implemented to minimise disruption where practicable and to protect the safety of residents, businesses, workers and road users. Project activities are being carried out in accordance with the project's environmental, social, health and safety requirements.

The BWA is providing this information to help residents, businesses and farmers understand the project, upcoming activities and how to obtain additional information or raise concerns if needed.

PMO/SC-WRRP/2026/080

June 17, 2026

Residents and Business Owners
Harmony Hall
Christ Church
Barbados

Enclosed is a **Frequently Asked Questions (FAQ)** document that provides additional information on:

- The South Coast Water Reclamation Project.
- Upcoming project activities.
- Temporary disruptions that may occur during construction.
- Safety measures.
- Community engagement.
- The project's Grievance Redress Mechanism (GRM).
- Project contact information.

We thank you for your patience and cooperation as these activities progress.

Should you require additional information or wish to raise a concern, please contact:

Contractor Contact

China Railway Shanghai Engineering Group Co., Ltd. (CRSE)

Email: crshebarbados@crshe.com
Grievance Hotline: (246) 826-0392

Barbados Water Authority (BWA)

Tracy Moore
Communications & Public Relations Officer – SCWRP
Email: tracy.moore@bwa.gov.bb

Grievance-related Matters

Ramona Sinanan
Social Management Specialist – SCWRP
Tel: (246) 434-4292
Email: Ramona.Sinanan@bwa.gov.bb

Kind Regards,

Yours faithfully,

Ian Constantine
SCWRP, Project Coordinator

BWA notice of 3 September 2026: Community Update No. 3, upcoming construction preparation activities

BARBADOS WATER AUTHORITY

GOVERNMENT OF BARBADOS
PINE COMMERCIAL ESTATE, THE PINE, ST MICHAEL, BB11103, BARBADOS
Tel: (246) 434-4200
Fax: (246) 228-0155

Our Ref: **PMO/SC-WRRP/2026/113**

Your Ref:

Date: September 3, 2026

Residents and Business Owners
Harmony Hall
Christ Church
Barbados

Dear Resident / Business Owner,

RE: SOUTH COAST WATER RECLAMATION PROJECT – COMMUNITY UPDATE NO. 3 & UPCOMING CONSTRUCTION PREPARATION ACTIVITIES

The Barbados Water Authority (BWA), through the South Coast Water Reclamation Project (SCWRP), wishes to advise residents and businesses of upcoming site construction preparation and mobilisation work within the project area.

Given the overall construction schedule requirements of the project, site construction preparation and mobilisation works are planned to commence with the following activities scheduled to begin shortly:

The upcoming works include:

- Site clearance within the project camp and plant boundary
- Filling and construction of the temporary access road
- Construction of the workers' and management personnel's camp

The above works are an important prerequisite for the formal commencement of construction at both the existing plant and the new plant in Harmony Hall, Christ Church.

Residents and businesses may observe increased contractor and workforce activity, movement of project-related vehicles and equipment, and site preparation work within the project area. Efforts will be made to minimise disruption and maintain safety throughout these activities.

We thank you for your patience, cooperation and understanding as these important national works continue.

Should you require additional information or wish to raise a concern, please contact:

Contractor Contact:
China Railway Shanghai Engineering Group Co., Ltd. (CRSE)
Email: crshebarbados@crshe.com
Grievance Hotline: (246) 826-0392

PMO/SC-WRRP/2026/113

September 3, 2026

Residents and Business Owners
Harmony Hall
Christ Church
Barbados

Barbados Water Authority (BWA)
Tracy Moore
Communications & Public Relations Officer – SCWRP
Email: tracy.moore@bwa.gov.bb

Grievance-related Matters
Ramona Sinanan
Social Management Specialist – SCWRP
Tel: (246) 434-4292
Email: Ramona.Sinanan@bwa.gov.bb

Kind Regards,

Ian Constantine
SCWRP, Project Coordinator

cc: Mr. Peter Thompson, Chief Executive Officer, BWA
Ms. Gillian Applewhaite, Chief Operating Officer, BWA
Mrs. Shelley Parris, Project Manager, Project Management Office, BWA.

BWA notice of 16 September 2026: Community Update No. 4, invitation to the Town Hall of 23 September 2026

BARBADOS WATER AUTHORITY

GOVERNMENT OF BARBADOS
PINE COMMERCIAL ESTATE, THE PINE, ST MICHAEL, BB11103, BARBADOS
Tel: (246) 434-4200
Fax: (246) 228-0155

Our Ref: *Your Ref:*

Date: September 16, 2026

Residents and Business Owners
Harmony Hall, Christ Church, Barbados

Dear Resident / Business Owner,

RE: COMMUNITY UPDATE NO. 4: INVITATION TO THE SOUTH COAST WATER RECLAMATION PROJECT TOWN HALL MEETING/PUBLIC CONSULTATION

The Barbados Water Authority invites residents, business owners within the project area to attend a Town Hall/Public Consultation on the South Coast Water Reclamation Project. The meeting will provide an update on the project, its purpose, and its anticipated benefits for the community and the environment. Attendees will also have an opportunity to ask questions, share ideas and provide feedback. The consultation will address the Environmental and Social Impact Assessment and Environmental and Social Management Plan.

Date: Wednesday, September 23, 2026
Time: 6:30 p.m. to 8:30 p.m.
Venue: Hawthorn Methodist Church
Address: "Hathway," Rendezvous Hill, Christ Church

Your participation is important. We encourage residents and representatives of businesses in the area to attend and contribute to the discussion. The enclosed poster provides additional information and links to project resources. We look forward to your participation.

Contractor Contact:
China Railway Shanghai Engineering Group Co., Ltd. (CRSE)
Email: crshebarbados@crshe.com
Grievance Hotline: (246) 826-0392

Barbados Water Authority (BWA)
Tracy Moore | Communications & Public Relations Officer – SCWRP
Tel: **(246) 434-4200, extension 4337**
Email: tracy.moore@bwa.gov.bb

Grievance-related Matters
Ramona Sinanan | Social Management Specialist – SCWRP
Tel: (246) 434-4292
Email: scwrp.grievances@bwa.gov.bb

Kind Regards,

Ian Constantine
SCWRP, Project Coordinator

Executive Summary

Two public engagement sessions were held on the South Coast Water Reclamation Project (SCWRP) to disclose project information, present the Environmental and Social Impact Assessment (ESIA) and Environmental and Social Management Plan (ESMP), explain the project Grievance Redress Mechanism

(GRM), and gather stakeholder questions and feedback before the safeguards documents are finalised. The First Town Hall Meeting was held in person at Hawthorne Methodist Church on 23 September 2026, and a Virtual Town Hall was held on Zoom on 8 October 2026.

The proceedings at the two meetings were not substantively different: the same project, safeguards, public-health and grievance-redress information was presented. This report therefore describes the proceedings once, then reports stakeholder feedback separately for each meeting, followed by combined outcomes, next steps and the annexes for both meetings.

Second Town Hall: no substantive questions on the presented project scope were raised during the formal question-and-answer period. Two interventions were recorded: a supportive comment from a farmer on the use of reclaimed water for agriculture, and a complaint from a resident about recurrent odour in her area.

Third Town Hall: participants raised practical questions about worker accommodation and conduct, parking and welfare facilities, the use of reclaimed water, the reclaimed-water pipeline alignment, local versus non-national workers, and the potential to use the pipeline corridor for a future walking and cycling trail. A written follow-up from the Future Centre Trust clarified that its trail proposal would not require project funding for the trail surface, but asked that the pipeline corridor be reinstated to a compacted subbase specification that could later support a Trust-funded trail.

Meetings at a Glance

Table** 211**: Summary of the Two Town Hall Meetings

Item	Second Town Hall Meeting	Third Town Hall Meeting
Date	23 September 2026	8 October 2026
Format and venue	In person, Hawthorne Methodist Church (approx. 6:30 to 8:30 pm)	Virtual (Zoom)
Participants recorded	59 (attendance register)	34 (consultation log entries); approx. 28 to 30 concurrent participants on Zoom
Sex-disaggregated attendance	Male: 30 (50.8%) Female: 26 (44.1%) Not recorded / N/A: 3 (5.1%)	Not captured in the consultation log
Who attended	Community members, farmers, project stakeholders, representatives of the Barbados Water Authority (BWA) and Ministry of Health, ministers, public-health and environmental personnel, the project contractor, and consultants	BWA, SAEDI Consulting, project partners (IDB, EIB, CRSEG), civil-society and community / public participants

Item	Second Town Hall Meeting	Third Town Hall Meeting
Stakeholder feedback recorded	2 interventions (1 farmer comment, 1 resident complaint)	5 recorded comments / questions, plus 1 written submission after the meeting (Future Centre Trust)
Recording and presentation	Not applicable	Recording: Zoom link (Passcode: =RKJLKn1) Presentation: Google Drive link
Annex	Annex A: Attendance sheets	Annex B: Participation record; Annex C: Presentation slides

Note: *Participant figures are register or log entries and are not de-duplicated across the two meetings (59 + 34 = 93 entries combined). Zoom counts include hosts, presenters and automated transcription services where present and should not be read as unique attendees. Some entries in the virtual consultation log are Zoom display or device names rather than full personal names.*

Proceedings Common to Both Meetings

Both meetings followed the same structure: project disclosure first, then an open floor for stakeholder questions and comments. The objectives of the ESIA/ESMP consultation, as presented, were to disclose project information, capture stakeholder concerns, support inclusive participation, reinforce awareness of the GRM, document engagement outcomes, and close the feedback loop.

Project Information Presented

The SCWRP was presented as a water-resilience and wastewater-treatment investment intended to improve wastewater treatment, increase the use of reclaimed water, protect the Graeme Hall Swamp and strengthen sector operations. It comprises four main components:

- Upgrading the existing wastewater treatment plant from primary treatment to secondary and tertiary treatment and constructing a new advanced water reclamation and reuse facility (the South Coast Water Reclamation and Re-use Facility, SCWRRF).
- Constructing an approximately 25 km reclaimed-water pipeline through Christ Church and parts of St. George to River Plantation, St. Philip, to support agricultural irrigation and non-potable groundwater (aquifer) recharge.
- Installing approximately 7 MW of solar photovoltaic generation with battery storage, alongside biodiversity and wetland protection and restoration measures associated with the Graeme Hall Swamp.
- Institutional strengthening, training and capacity building for the BWA and relevant government partners, including improved monitoring and verification systems and support for inclusion in the water sector.

Construction was reported as scheduled to begin in October 2026, with the main construction period continuing to approximately May 2029. Contractor operational support and knowledge transfer are expected to continue after commissioning, through approximately May 2032.

On financing, the First Town Hall was told that the project has a combined financing package of approximately BBD $220 million, comprising loans and grant financing, including support from the Inter-American Development Bank (IDB) and the Green Climate Fund (GCF). The Virtual Town Hall presentation identified US$110 million in upfront financing from the IDB and GCF, including a US$40 million GCF grant, with the European Investment Bank (EIB) supporting the wider debt-conversion structure through a guarantee.

The Government of Barbados is the project owner, with the BWA serving as executing agency. China Railway Shanghai Engineering Group (CRSEG) is the design-build contractor, and AECOM is providing contract-administration and construction-oversight support.

Agenda and Presenters

Table** 212**: Agenda Items Covered at Each Meeting

Agenda item	**First Town Hall (23 Sept)**	**Virtual Town Hall (8 Oct)**
Welcome and housekeeping	Covered	Tracy Moore, PR and Communications (moderator)
Project overview: purpose, scope, benefits, financing and delivery arrangements	Covered	Ian Constantine, SCWRP Project Coordinator
Construction and engineering update	Covered	Within project overview
Grievance Redress Mechanism and stakeholder engagement arrangements	Covered	Ramona Sinanan, SCWRP PEU Social Management Specialist
ESIA/ESMP findings: key risks, impacts and mitigation measures	Covered	Leisa Perch, SAEDI Consulting (Barbados) Inc. (on behalf of CRSEG)
Public-health safeguards and environmental monitoring	Covered	Within ESIA/ESMP presentation
Questions, comments and feedback	Covered	All presenters

Water Security, Agriculture and Long-Term Benefits

A central theme was the use of reclaimed water to improve Barbados' water resilience while reducing pressure on potable-water supplies. The project is expected to produce just over 3 million cubic metres of reclaimed water annually and support irrigation for up to approximately 1,320 hectares of farmland, as presented. The reclaimed-water system is also intended to support aquifer recharge. The upgrade from primary treatment to more advanced treatment was presented as an opportunity to improve effluent quality, reduce odour, strengthen monitoring, improve food and water security, and develop local technical capacity.

Construction Readiness and Management of Temporary Impacts

As reported at the First Town Hall, the contractor had commenced mobilisation, including site clearing, temporary access arrangements, temporary drainage works, delivery of more than 20 containers and other equipment, and approximately 700 tons of reinforcing steel. The bioreactor tank was identified as one of the first major structures expected to commence at foundation level, with the initial foundation works estimated at approximately six to eight weeks. Multiple activities are expected to proceed concurrently. Local participation had also begun through subcontracting, surveying, geotechnical work, and locally rented equipment and operators.

It was acknowledged that construction will create temporary inconvenience, including noise, dust and traffic impacts. A dust complaint received during mobilisation had been addressed through watering and covering exposed material, after which no further dust complaints had been reported at the time of the First Town Hall.

Environmental and Social Safeguards

The ESIA/ESMP presentation covered the existing treatment-plant upgrade, the new reclamation facility and the workers' camp, and outlined risks associated with community health and safety, labour influx, sanitation, traffic and road safety, noise, air quality, runoff and sedimentation, biodiversity, and cumulative pressures. Particular attention was given to the sensitivity of the Graeme Hall wetland environment. Proposed controls include environmental monitoring, incident and emergency-response planning, labour-management requirements, a code of conduct, community-health measures, occupational health and safety provisions, biodiversity and habitat-protection measures, waste management and recycling, and procedures for unexpected archaeological or cultural-heritage discoveries. Toolbox talks are also expected to reinforce site requirements during implementation.

The presentation covered the scope of the ESIA and ESMP, including the baseline assessment, legal and institutional framework, impact assessment, management plans and stakeholder engagement process. It reported engagement with 79 community members during field data collection, including female-headed households, tenants, elderly persons living alone, migrant / non-national workers and persons with disabilities. Community feedback collected during the assessment was generally supportive of the project, while highlighting the need to manage temporary construction impacts. Frequently raised benefits included improved wastewater treatment, water conservation and reuse, reduced pollution, improved environmental quality, and local jobs and business opportunities. Frequently raised concerns included temporary access disruption, noise, road and pedestrian safety, traffic congestion and dust.

The ESMP management plans cover noise, air quality, spill response, erosion and sediment control, reclaimed-water quality assurance, biodiversity protection, waste management, labour conditions, worker conduct, community health, SEA/SH/GBV risk management, traffic, emergency response, stakeholder engagement and the GRM.

Public Health and Monitoring

The public-health presentation emphasised that reclaimed-water use must be supported by appropriate treatment standards, safeguards against contamination, and continuous monitoring. Oversight is expected to involve the BWA and relevant units within the Ministry of Health and Wellness, including environmental-health and environmental-protection functions. Monitoring will include treatment

performance and water quality, with continued attention to groundwater, recreational-water quality, air and noise. Worker accommodation is also subject to environmental-health approval and ongoing inspection relating to sanitation, ventilation and other health requirements.

Grievance Redress Mechanism

The GRM was presented as a free and accessible mechanism available to residents, businesses, landowners, government agencies, civil-society organisations, suppliers, contractors and project workers. Stakeholders may submit grievances through the channel they consider easiest and safest, including email, telephone, town halls and the Community Liaison Officer. A suggestion box and QR codes were also available at the First Town Hall as additional channels for feedback and project information.

The process presented includes acknowledgement within two days, eligibility screening within three to five working days, assessment or investigation within ten to fifteen working days, communication of the proposed outcome within three to five working days following review, and case closure once agreed actions have been implemented and monitored. Sensitive complaints, including SEA/SH/GBV matters, are to be escalated and handled confidentially using a survivor-centred approach.

GRM contacts: scwrp.grievances@bwa.gov.bb | (246) 434-4200 ext. 4337.

Feedback from the First Town Hall (23 September 2026)

The moderator invited questions several times during the formal question-and-answer period; however, no substantive questions about the presented project scope were raised. Instead, two main contributions were recorded.

Farmer Comment: Peter Chase, identified during the meeting as President of the Food and Vegetable Farmers Association, welcomed the proposed use of reclaimed water for agriculture. He highlighted the difficulty experienced by farmers in obtaining an adequate water supply, particularly in the River area of St. Philip, and expressed support for the project's potential to improve agricultural water availability. He also referred to the use of treated or reclaimed water to support agriculture in other countries and expressed hope that similar support could eventually benefit farmers in other parts of Barbados.

Resident Complaint: A resident of Rendezvous Ridge reported a recurring strong odour that she associated with the South Coast sewage system. She stated that the odour had been severe in 2024, had improved during 2025, but had become very noticeable again approximately two weeks before the meeting, to the extent that she could not comfortably open doors and windows. She also noted that she had previously raised the issue through emails, telephone calls and the media. The project representatives indicated that her contact details would be taken and that an engineer associated with the South Coast sewage plant would follow up to investigate the issue and provide information.

Post-Meeting Clarifications from CRSEG

Following the First Town Hall, CRSEG provided the following clarifications in response to technical questions identified for follow-up.

Question: Will the 7 MW solar plant provide power to the grid?

CRSEG response: The solar power facility installed within the project site is primarily intended to provide renewable energy for the project itself and will not supply power to the public grid.

Question: What happens to the sludge?

CRSEG response: Sludge generated during the wastewater treatment process will be properly handled on site. The project includes sludge dewatering and solar drying facilities to reduce the moisture content and volume of the sludge. The treated sludge will subsequently be disposed of or beneficially reused in accordance with relevant environmental requirements and as approved by the competent authorities.

Question: The water reclamation plant will be supplied by the existing sewage system. Will there be capacity to truck in sewage from other parts of Barbados?

CRSEG response: The project design considers receiving sludge from the Bridgetown Sewage Treatment Plant for drying using this project's sludge treatment facilities. There is no current plan to routinely receive sewage trucked in from other parts of Barbados.

Feedback from the Virtual Town Hall (8 October 2026)

Following the presentations, the floor was opened for stakeholder questions and comments. The matrix below summarises the specific comments and questions recorded and the responses provided during the session.

Table** 213**: Stakeholder Comments, Questions and Responses (Virtual Town Hall)

#	Issue	Comment / question	Response provided	Follow-up / status
1	Worker facilities and site management	Asked how parking, breaks, smoking and waste would be managed for the construction workforce.	SAEDI advised that a workers' camp would be established on-site, supported by designated welfare and parking arrangements, waste-management controls and smoking restrictions.	Requirements to be implemented through the Workers' Camp ESMP, waste plan, HSE requirements and worker Code of Conduct.
2	Reclaimed water and potable-water demand	Asked how the project would reduce the need for drinking water.	Project representatives explained that reclaimed water would be used for agricultural irrigation and non-potable recharge, thereby reducing pressure on potable water supplies. The reclaimed water would be treated to a higher standard than the current effluent discharge.	Continue public communication on intended reclaimed-water uses, water-quality controls and recharge arrangements.

#	Issue	Comment / question	Response provided	Follow-up / status
3	Pipeline alignment	Asked whether the reclaimed-water pipeline would pass near the Dover / Divi Southwinds area.	Dr. Mwansa clarified that the pipeline would not run south along Highway 7 or through Dover. The route would extend from Graeme Hall toward the Ministry of Agriculture, the St. George Valley and other designated agricultural / recharge areas.	Final alignment and construction-stage access impacts should continue to be disclosed to affected communities.
4	Potential walking and cycling trail along pipeline corridor	Proposed that the pipeline corridor could support a public walking and cycling trail and act as a communication and recreation asset.	The project team noted that project funding was not currently available for trail paving under the climate-finance conditions, but indicated openness to coordination where compatible reinstatement or third-party funding could support the concept.	Future Centre Trust submitted a written clarification after the consultation (see below). Further discussion at the proposed site meeting is requested.
5	Worker sourcing and accommodation	Asked how workers for the new treatment facilities would be sourced and accommodated.	Dr. Mwansa clarified that non-national Chinese workers associated with the lead contractor would be housed in the on-site workers' camp, while local Barbadian workers would commute to the site.	Worker accommodation, transport, welfare and conduct to be managed through the ESMP and labour / worker-camp requirements.

Future Centre Trust Follow-Up Submission

Following the Virtual Town Hall, Barney Gibbs, Director and Trailway Lead of the Future Centre Trust, submitted a written clarification concerning the proposed trailway along the pipeline corridor. The submission requested that the proposal be included in the ESIA comment-response record.

- The Trust clarified that it is not requesting SCWRP funding for the trail surface. It requested that, where the pipeline follows the proposed corridor, the works be reinstated to a compacted subbase built to an agreed specification, after which the Trust would fund and install the trail surface.
- The Trust noted that the completed trail could provide an all-weather access route to BWA valves and chambers and stated that it would keep the pipeline strip free of trees to preserve BWA access.
- The Trust requested the consultation summary and chat record and asked that its written submission be included in the formal ESIA consultation comment-response record.
- A site meeting was proposed for further technical discussion.

Key Outcomes Across Both Meetings

Table** 214**: Key Consultations Outcomes and Required Follow-Up

Outcome	**Implication for ESIA/ESMP**	**Follow-up action**
Support for project benefits (including from the farming community) alongside concern about construction disruption.	Maintain strong controls for traffic, dust, noise, access and worker-community interaction.	Retain and strengthen mitigation, monitoring and advance communication measures.
Recurrent odour reported by a resident near the South Coast sewage system.	Odour is a visible community concern; improved treatment was presented as an opportunity to reduce odour.	BWA / South Coast sewage plant engineer to follow up with the resident.
Questions remain about reclaimed-water use and groundwater recharge.	Water-quality and safe-use information should remain prominent in disclosure materials.	Continue stakeholder communication on non-potable uses, monitoring and public-health safeguards.
Worker accommodation and conduct remain socially sensitive.	Workers' camp management, labour conditions, Code of Conduct, waste and community health measures are material safeguards.	Ensure clear implementation responsibilities, monitoring and accessible grievance channels.
Pipeline alignment affects how communities understand local impacts.	Route-specific disclosure will be important as Component 2 advances.	Provide updated alignment, access and construction information to affected communities when available.
Future Centre Trust trailway proposal requires a formal project response.	The proposal should be logged in the ESIA consultation comment-response record.	BWA / CRSEG to consider technical compatibility, reinstatement requirements and next-step discussion.

Conclusion and Next Steps

The First Town Hall was primarily information-sharing in nature. Although its question-and-answer period generated limited discussion, the farmer comment and the resident complaint provided two clear pieces of stakeholder feedback. The Virtual Town Hall generated more detailed practical questions, particularly on worker accommodation, reclaimed-water use, pipeline alignment and the proposed trailway.

The project team is expected to review consultation feedback from both meetings, update the ESIA/ESMP as required, and resubmit the documents to the IDB in accordance with the project review process. Design reviews and construction activities will continue in parallel, together with the identified mitigation, monitoring, health and safety, community-engagement and grievance measures.

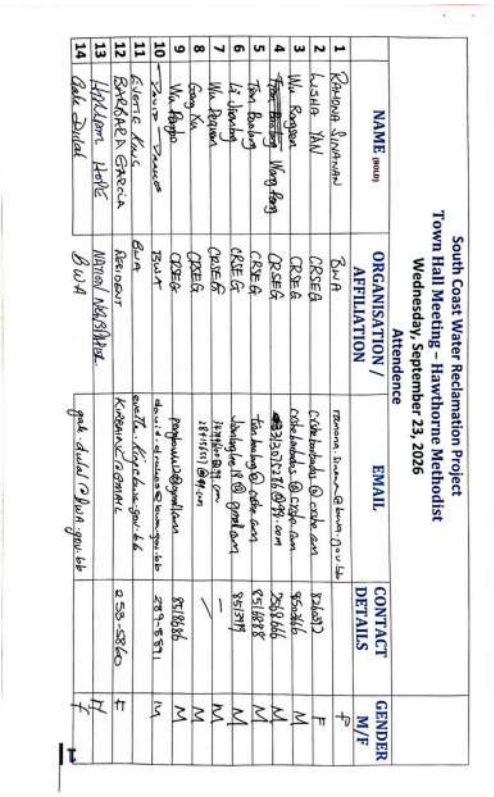
Table** 215**: Follow-Up Areas, Responsibilities and Due Dates

Follow-up area	Responsibility	Due date
Review stakeholder feedback from both meetings, update the ESIA/ESMP as required and resubmit to the IDB	Project team / SAEDI Consulting	Following consultation / before final submission
Include the Future Centre Trust written submission in the ESIA comment-response record and record the project response once determined	BWA / CRSEG / SAEDI Consulting	Following consultation / before final submission
Follow up on the resident complaint concerning recurrent odour	BWA / South Coast sewage plant engineer	Prompt follow-up
Continue dust, noise, runoff, traffic and environmental controls during mobilisation and construction	EPC contractor / Project team	Ongoing
Maintain and publicise GRM and stakeholder communication channels, including the project email and telephone contacts	Social Management Specialist / Community Liaison	Throughout project

Responsibilities and due dates can be confirmed and updated as implementation planning progresses.

Second Town Hall Attendance Sheets

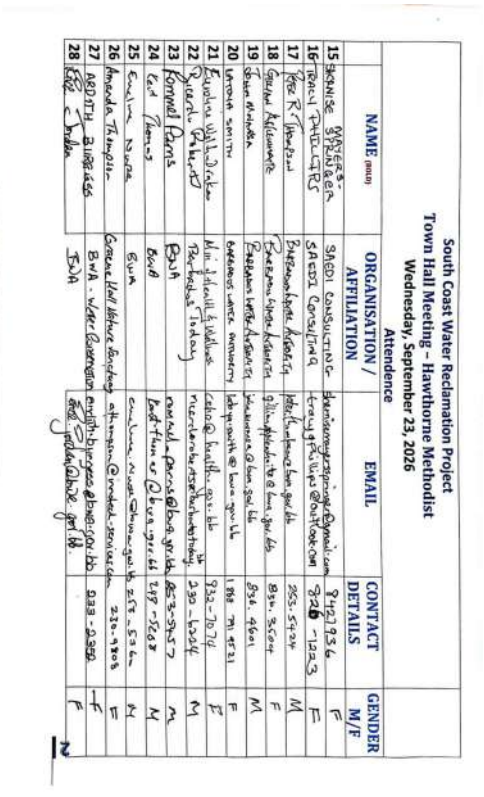
Attendance register for the Second Town Hall Meeting held on 23 September 2026 (59 attendees recorded).



South Coast Water Reclamation Project
Town Hall Meeting – Hawthorne Methodist
Wednesday, September 23, 2026
Attendence

	NAME (PRINT)	ORGANISATION / AFFILIATION	EMAIL	CONTACT DETAILS	GENDER M/F
1	Rajendra Sinchaudhari	BWA	[illegible]	[illegible]	M
2	Lusia Yan	CRSEA	[illegible]	[illegible]	F
3	Wu Rogers	CRSEA	[illegible]	[illegible]	M
4	Tom Bailey Wong-fong	CRSEA	[illegible]	[illegible]	M
5	Tom Bailey	CRSEA	[illegible]	[illegible]	M
6	Li Wenling	CRSEA	[illegible]	[illegible]	M
7	Wu Rogers	CRSEA	[illegible]	[illegible]	M
8	Gang Xia	CRSEA	[illegible]	[illegible]	M
9	Wu Fang	CRSEA	[illegible]	[illegible]	M
10	Paul Dennis	BWA	[illegible]	[illegible]	M
11	Alberto Rios	BWA	[illegible]	[illegible]	M
12	BARBARA GARCIA	Resident	[illegible]	258-5860	F
13	Hirkimi Hoffe	National Wildlife	[illegible]		F
14	Gale Dodel	BWA	[illegible]		F

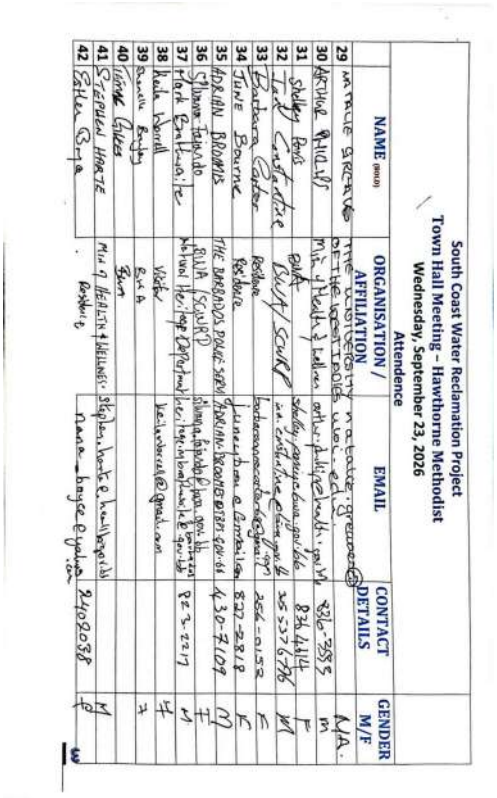
Figure 93**: Second Town Hall Attendance Record #1**



South Coast Water Reclamation Project
Town Hall Meeting – Hawthorne Methodist
Wednesday, September 23, 2026
Attendence

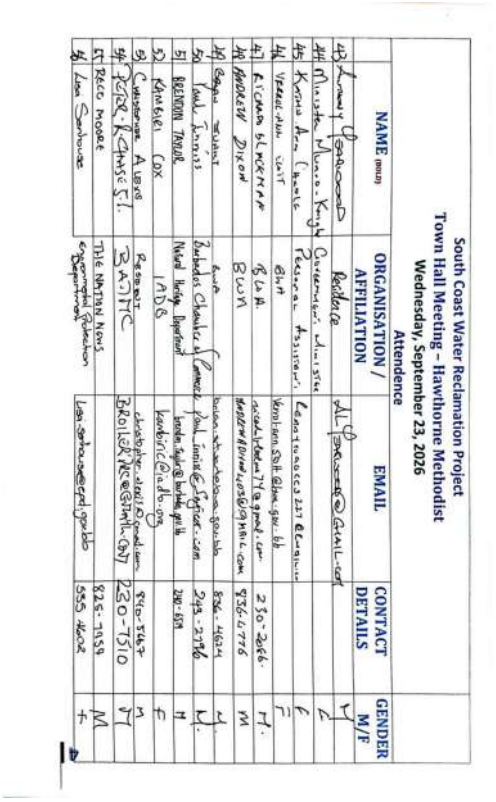
	NAME (PRINT)	ORGANISATION / AFFILIATION	EMAIL	CONTACT DETAILS	GENDER M/F
15	[illegible]	[illegible]	[illegible]	[illegible]	F
16	[illegible]	[illegible]	[illegible]	[illegible]	F
17	[illegible]	[illegible]	[illegible]	[illegible]	M
18	[illegible]	[illegible]	[illegible]	[illegible]	F
19	[illegible]	[illegible]	[illegible]	[illegible]	M
20	[illegible]	[illegible]	[illegible]	[illegible]	F
21	[illegible]	[illegible]	[illegible]	[illegible]	F
22	[illegible]	[illegible]	[illegible]	[illegible]	M
23	[illegible]	[illegible]	[illegible]	[illegible]	M
24	[illegible]	[illegible]	[illegible]	[illegible]	M
25	[illegible]	[illegible]	[illegible]	[illegible]	M
26	[illegible]	[illegible]	[illegible]	[illegible]	F
27	[illegible]	[illegible]	[illegible]	[illegible]	F
28	[illegible]	[illegible]	[illegible]	[illegible]	F

Figure 94**: Second Town Hall Attendance Record #2**



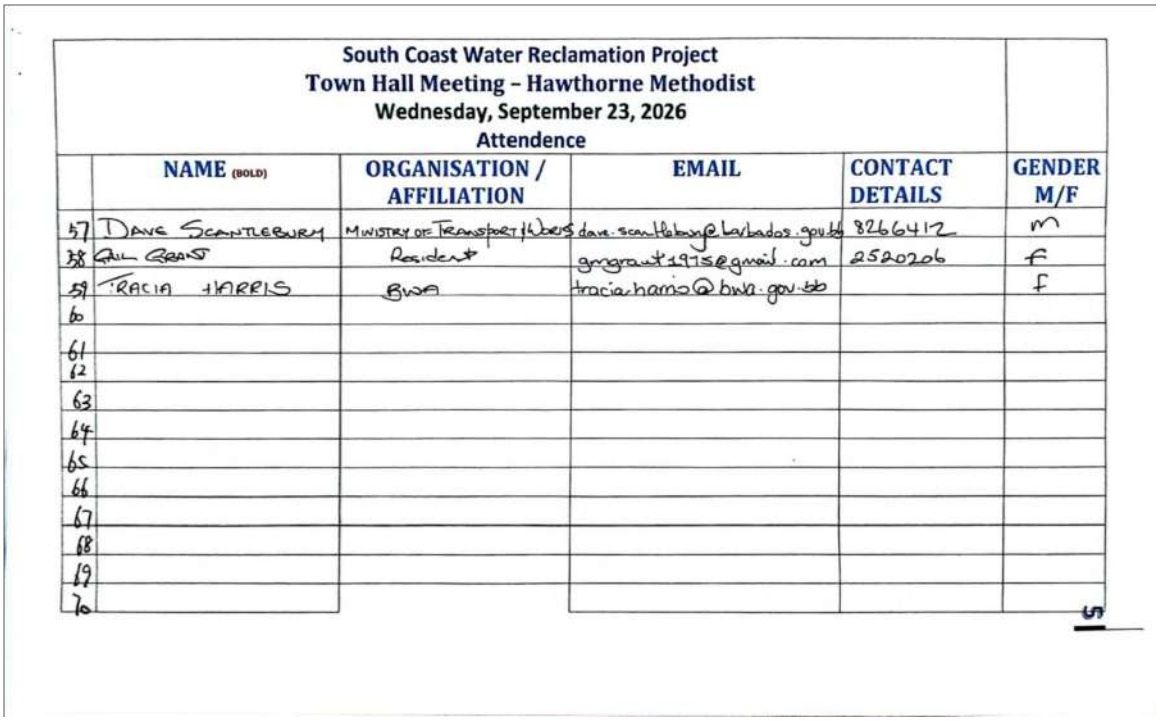
South Coast Water Reclamation Project
Town Hall Meeting – Hawthorne Methodist
Wednesday, September 23, 2026
Attendence

	NAME (BOLD)	ORGANISATION / AFFILIATION	EMAIL	CONTACT DETAILS	GENDER M/F
29	MARJORIE SPENCER	THE DISTRICT CONSTABULARY OF THE WEST INDIES (RETIRED)	greenwood@	836-2855	N/A
30	ARTHUR RHILLY	MIN. OF HEALTH & WELLNESS	arthur.phillips@health.gov.bb		M
31	Shelley Ross	BWA	shelley.ramsey@bwa.gov.bb	836 4414	F
32	Lord Cassandra	BWA/ SCAWD	cassandra.lord@bwa.gov.bb	245-237-6786	F
33	Barbara Carter	Resident	barbaracarter@gmail.com	2654-0152	F
34	JANE Bourne	Resident	janebourne@hotmail.com	827-2818	F
35	ADRIAN BLOOMFIELD	THE BARBADOS POLICE SERVICE	ADRIAN.BLOOMFIELD@BARBADOS.GOV.BB	430-7109	M
36	Clinton Taitt-Alleyne	BWA (SCAWD)	clinton.taitt-alleyne@bwa.gov.bb		M
37	Mark Easterbrook	National Hurricane Centre	mark.easterbrook@noaa.gov	822-2217	M
38	Paula Worrell	Visitor	paulaworrell@gmail.com		F
39	Dennis Bayley	BWA			M
40	Jeffrey Chase	BWA			M
41	Stephen HARTE	MIN of HEALTH & WELLNESS	Stephen.harte@health.gov.bb	2490888	M
42	Esther Griffith	Resident	Name_boyce@yahoo.com		F



South Coast Water Reclamation Project
Town Hall Meeting – Hawthorne Methodist
Wednesday, September 23, 2026
Attendence

	NAME (BOLD)	ORGANISATION / AFFILIATION	EMAIL	CONTACT DETAILS	GENDER M/F
43	Anthony Greenwood	Resident	[illegible]@gmail.com		M
44	Minister Munro-King	Government Minister			F
45	Karina Ann Lashley	Resident Assistant	Lashleyka237@yahoo.com		F
46	Vernon Gill	BWA	Vernon.Gill@bwa.gov.bb	230-2666	M
47	Richard McKenzie	BWA	richardmckenzie74@gmail.com		M
48	Andrew Dixon	BWA	andrewdixon1959@hotmail.com	836-6776	M
49	Roger Tennant	Barbados Chamber of Commerce	roger.tennant@sagicor.com	836-4624	M
50	Paul Inniss	Natural Hazards Department	paul.inniss@barbados.gov.bb	245-2396	M
51	BRENDON TAYLOR		brendon.taylor@barbados.gov.bb	230-659	M
52	Kimberly Cox	IADB	kimberlyc@iadb.org		F
53	Christopher A. Lewis	Resident	christopher.lewis1@gmail.com	836-5467	M
54	PETER K. CHASE SR.	BAWTC	PETER.K.CHASE@BTMU.COM	230-7510	M
55	Reco Moore	THE NATION NEWS			M
56	Lisa Sealy-Jones	Environmental Protection Department	lisa.sealy-jones@epd.gov.bb	535-4602	F



South Coast Water Reclamation Project
Town Hall Meeting – Hawthorne Methodist
Wednesday, September 23, 2026
Attendence

	NAME (BOLD)	ORGANISATION / AFFILIATION	EMAIL	CONTACT DETAILS	GENDER M/F
57	DAVE SCANTLEBURY	MINISTRY OF TRANSPORT & WORKS	dave.scantlebury@barbados.gov.bb	8266412	M
58	GAIL GRANT	Resident	gmgrant1975@gmail.com	2520206	F
59	TRACIA HARRIS	BWA	tracia.harris@bwa.gov.bb		F
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Figure 95**: Second Town Hall Attendance Record #3**

Figure 96**: Second Town Hall Attendance #4**

Figure 97**: Second Town Hall Attendance Record #5**

Annex B: Virtual Town Hall Participation Record

The virtual consultation log contains 34 entries. The entries include named participants, organisational representatives and some Zoom display / device names. Figures 6 to 9 provide a visual record of participation.

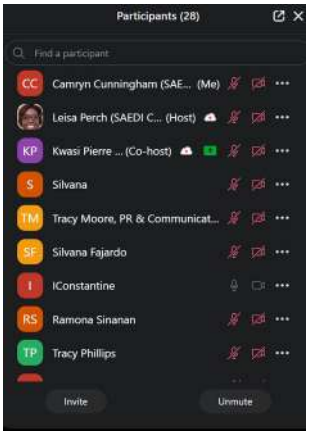


Figure 98**: Third Town Hall Participant List Part 1. Source: Camryn Cunningham**

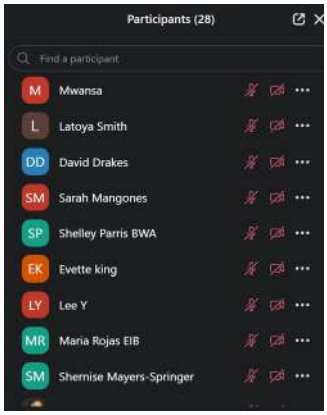


Figure 99**: Third Town Hall Participant List Part 2. Source: Camryn Cunningham**

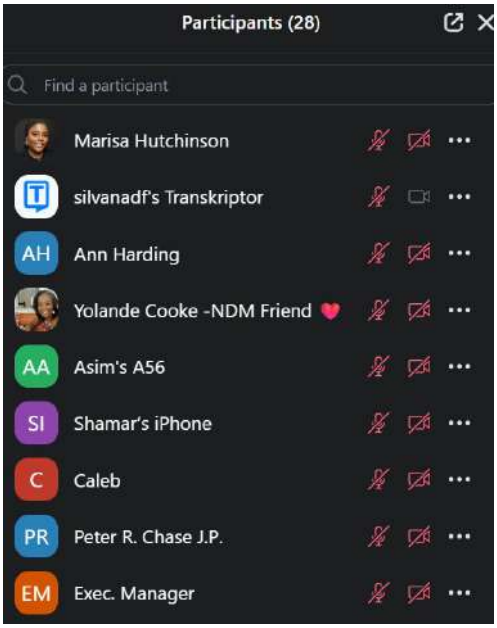


Figure 100**: Third Town Hall Participant List Part 3. Source: Camryn Cunningham**

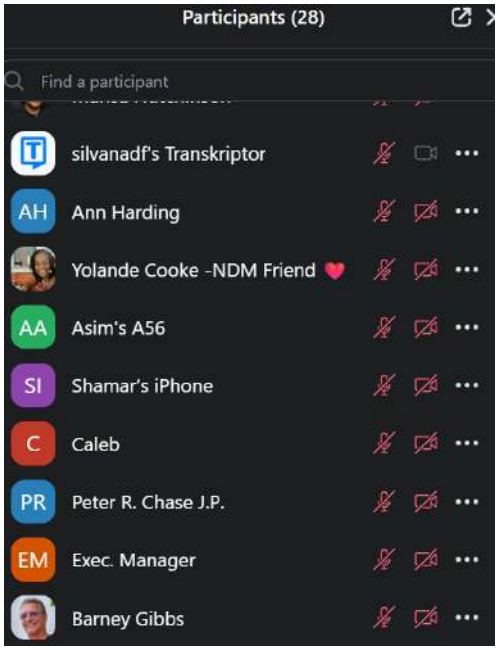


Figure 101**: Third Town Hall Participant List Part 4. Source: Camryn Cunningham**

Table** 216**: SCWRP virtual consultation participant log, 8 October 2026

No.	Name	Organisation	Email / contact information
1	Leisa Perch	SAEDI Consulting (Barbados) Inc.	leisa@saediconsulting.com

No.	Name	Organisation	Email / contact information
2	Kwasi Pierre	SAEDI Consulting (Barbados) Inc.	projectmanager1@saediconsulting.com
3	Silvana Fajardo	BWA, SCWRP	silvana.fajardo@bwa.gov.bb
4	Tracy Moore	BWA, SCWRP	tracy.moore@bwa.gov.bb
5	Ian Constantine	BWA, SCWRP	ian.constantine@bwa.gov.bb
6	Ramona Sinanan	BWA, SCWRP	ramona.sinanan@bwa.gov.bb
7	Dr. B.J Mwansa	BWA	John.Mwansa@bwa.gov.bb
8	Latoya Smith	BWA, SCWRP	latoya.smith@bwa.gov.bb
9	Evette King	BWA, SCWRP	evette.king@bwa.gov.bb
10	David Drakes	BWA, SCWRP	david.drakes@bwa.gov.bb
11	Sarah Mangones	IDB	
12	Shelley Parris	BWA	shelley.parris@bwa.gov.bb
13	Gale Dulal	BWA, SCWRP	gale.dulal@bwa.gov.bb
14	Lee Y	CRSEG	
15	Camryn Cunningham	SAEDI Consulting (Barbados) Inc.	juniorassociate12@saediconsulting.com
16	Maria Rojas	EIB	
17	Shernise Mayers-Springer	SAEDI Consulting (Barbados) Inc.	juniorassociate13@saediconsulting.com
18	Marisa Hutchinson	SAEDI Consulting (Barbados) Inc.	
19	Ann Harding	Environmental Activist	
20	Yolande Cooke	NDM Friend	
21	Asim Parris-White	Property Manager, DIVI Southwinds	
22	Shamar Blenman	IDB	
23	Caleb		

No.	Name	Organisation	Email / contact information
24	Peter Chase		230-7510
25	Barney Gibbs	Future Center Trust	barney@antillesoutdoor.com or barney@futurecentretrust.org
26	Wu Rongsen	CRSEG	
27	Jemmott		
28	Kambiri Cox	IDB	kambiric@iadb.org
29	LWR		
30	Chris J Derrell		chrisjderrell@gmail.com
31	Laura Rudder	Resident - Dover/Maxwell	rudd2000@hotmail.com
32	Tracy Phillips	SAEDI Consulting (Barbados) Inc.	associate11@saediconsulting.com
33	Executive Manager		
34	Samsung SM-A1768		

Annex C: Virtual Town Hall Presentation Slides

Selected slides used to communicate the project scope, consultation objectives and community stakeholder expectations at the Virtual Town Hall.

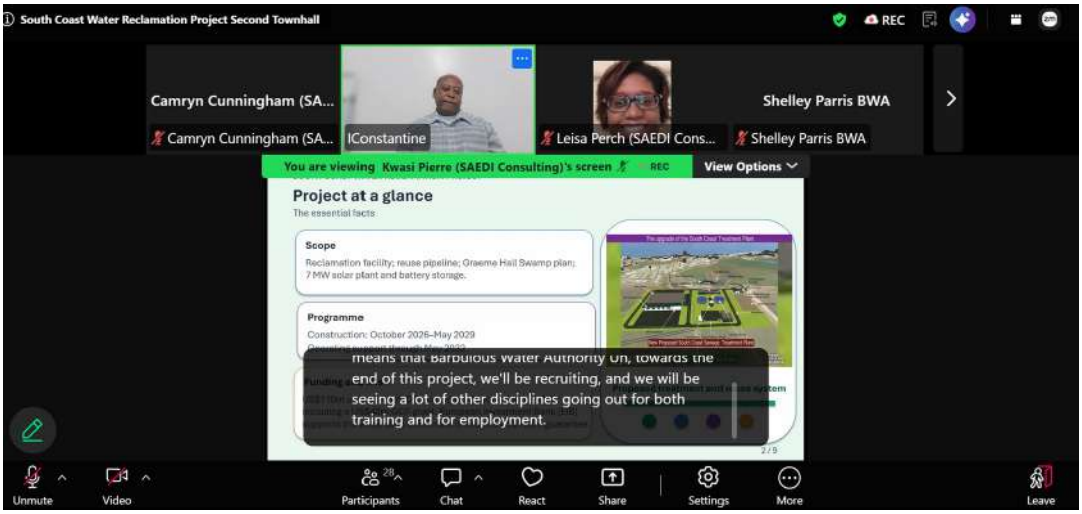


Figure 102**: Project-at-a-glance presentation during the virtual consultation. Source: Camryn Cunningham**

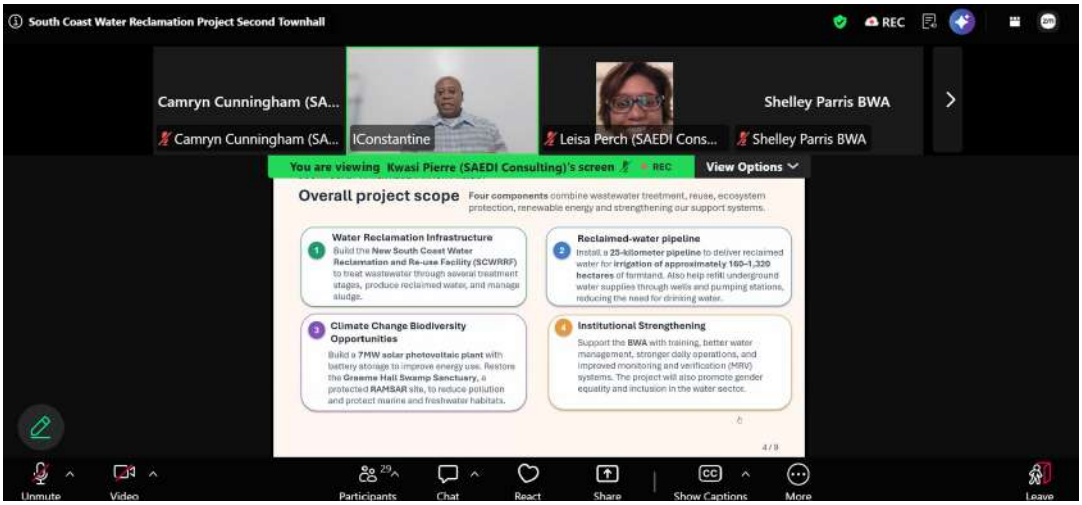


Figure 103**: Presentation of the overall SCWRP project scope. Source: Camryn Cunningham**

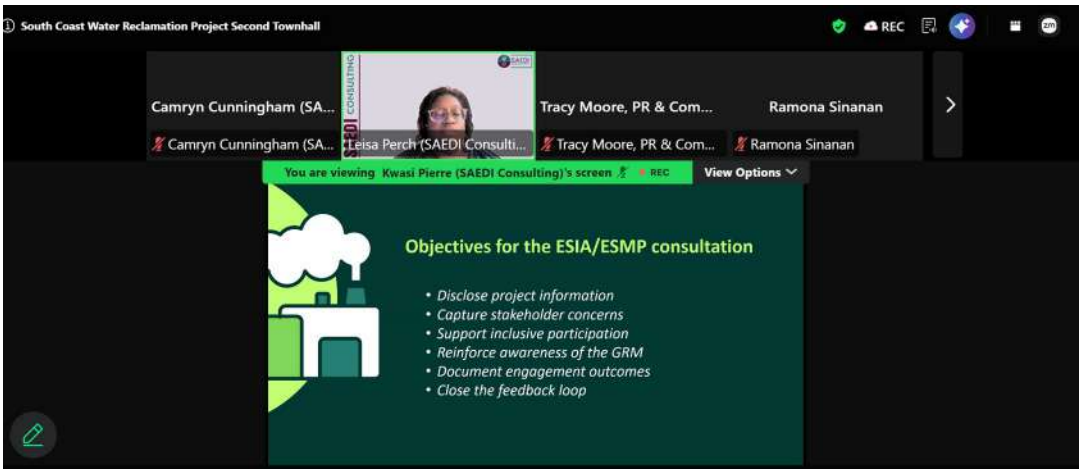


Figure 104**: ESIA/ESMP consultation objectives presented to participants. Source: Camryn Cunningham**

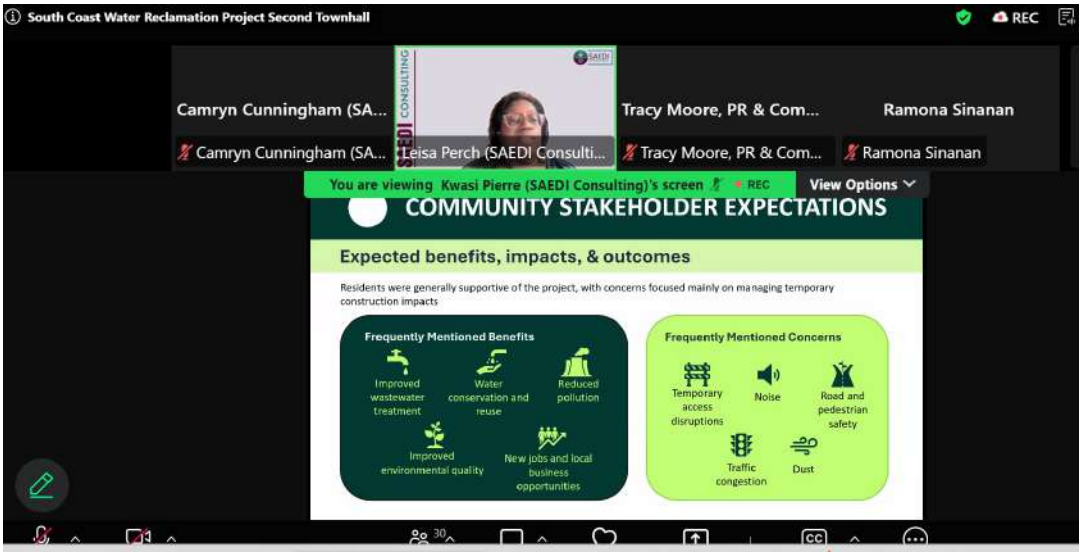


Figure 105**: Community stakeholder expectations presented during the ESIA/ESMP consultation. Source: Camryn Cunningham**

Annex J. Contractor's HSE Management Manual (REV2, 27 August 2026)

The Contractor's Health, Safety and Environment Management Manual (China Railway Shanghai Engineering Group Co., Ltd., Barbados Project Management Department, REV2, 27 August 2026) forms part of this submission as Annex J and is issued as a separate companion file, CRSEG_HSE_Management_Manual_REV2_27Aug26.docx (which is hyperlinked here). It is bound separately because it runs to 276 pages and reproducing it inside this report added a third to the length of the document and rendered its text unsearchable. Issued as its own file the manual remains searchable, its clauses can be cited and commented on directly, and the version annexed here is the same Rev. 2 that every reference in this report cites. The chapter map below allows any reference in this report to be followed to the corresponding chapter and page of the manual.

Table 216a: Annex J chapter map, Contractor HSE Management Manual REV2 (27 August 2026)

Chapter	Title	Page in the manual	Where this report relies on it
Front matter	Document Summary	17	
Front matter	List of Abbreviations	19	
1	General Provisions	25	
2	Basis for Preparation	32	
3	Project HSE Organizational Structure	35	
4	Risk Identification and Risk Assessment	40	
5	Safety Training and Education	59	

Chapter	Title	Page in the manual	Where this report relies on it
6	Personal Protective Equipment (PPE) Management	69	
7	Construction Site Safety Management	79	Section 7.2 Work at Heights and Section 7.3 Lifting and Hoisting cited at 8.4.13.5 and 8.4.13.11
8	Hazardous Chemicals Management Plan	113	
9	Safety Management of Key Work Processes	132	
10	Occupational Health Management	161	Section 10.4 cited at 8.4.13 point 9 (camp living and public health)
11	Environmental Protection Management	171	
12	Emergency Response Management	177	Serves as the Emergency Response Plan (8.4.13.21.1); Sections 12.2.1 and 12.2.12 cited at 8.4.13.5
13	Protection of Female Workers	234	
14	Incident Reporting and Investigation	238	Incident reporting procedure cited at 8.4.13.21
15	Subcontractor HSE Management	246	
16	Inspections and Audits	253	Inspection and audit regime cited at 8.5
17	Documentation and Record Management	267	

The manual is issued unchanged. Where a measure in this Environmental and Social Management Plan depends on a provision of the manual, that provision is also stated in full in the body of this report, so the obligation is readable without the companion file.

Annex K: Development Timeline for Additional Plans

Several detailed plans depend on final design, the construction method and the contractor's programme, so they are prepared after this ESIA is issued. Table 217 gives the owner and target month for each plan, and the trigger for each is recorded against it in Table 117. Each plan will be submitted to the PEU for review and approved before the activity it governs begins.

- **Site Drainage and Hydrological Management Plan** (Nov 2026, CRSEG): stormwater attenuation and drainage management.
- **Biodiversity Management and Habitat Protection Plan** (Dec 2026, SAEDI Consulting): gives effect to the Critical Habitat Assessment under gate condition G-23.
- **Noise and Vibration Plan** (Dec 2026, SAEDI Consulting): vibration management added to the existing Noise Management Plan.
- **Groundwater Protection and Monitoring Plan Enhancement** (Jan 2027, CRSEG): adds erosion, sediment and stormwater management. The full plan is approved before ground-breaking and again before operation.
- **HSE Plan Enhancement** (Jan 2027, CRSEG): evacuation routes, assembly points, safe high ground, drills and responsibilities. It builds on Chapter 12 of the HSE Management Manual (Annex J).

- **Energy Efficiency, GHG and Renewable Energy Plan** (Jan 2027, SAEDI Consulting).
- **Air Quality and Dust Plan** (Jan 2027, CRSEG).
- **Odor and Bioaerosol Plan** (Jan 2027, CRSEG).
- **Sludge and Residual Management Plan** (Apr 2027, CRSEG).
- **Operational Continuity and Bypass Management Plan** (Apr 2027, CRSEG).
- **Sewage Spill Response Protocol** (Apr 2027, CRSEG).

Plans that stay living documents will be revised and version-controlled as design, commissioning and monitoring data become available.

Table 217: Additional Plans Timeline and Responsible Party

Plan	Timeline	Owner
Site Drainage and Hydrology Management Plan	November 2026	CRSEG
Biodiversity Management and Habitat Protection Plan	December 2026	SAEDI Consulting
Noise and Vibration Plan (a Noise Management Plan has already been developed, vibration management will be added to the plan)	December 2026	SAEDI Consulting
Groundwater Protection and Monitoring Plan Enhancement (inclusion of elements on Erosion, Sediment and Stormwater Management)	January 2027	CRSEG
HSE Plan Enhancement (Evacuation Routes, Assembly Points, Safe High Ground, Drills and Responsibilities)	January 2027	CRSEG
Energy Efficiency, GHG and Renewable Energy Plan	January 2027	SAEDI Consulting
Air Quality and Dust	January 2027	CRSEG
Odor and Bioaerosol Plan	January 2027	CRSEG
Sludge and Residual Management Plan	April 2027[140]	CRSEG
Operational Continuity and Bypass Management Plan	April 2027[141]	CRSEG

[140] The arrangements for this plan require further discussion with the BWA PEU.
[141] Timeline for the development of this plan to be further discussed between CRSEG, BWA PEU and IDB.

Plan	Timeline	Owner
Sewage Spill Response Protocol	April 2027	CRSEG

Annex L: Public Disclosure Evidence

Table 218 provides links to the public disclosure provided to the public and surrounding community related to activities on the upcoming SCWRRF and SCSTP project.

Table 218: Public Disclosure Evidence List

Public Disclosure Evidence	Corresponding Link
Community Liaison Officer Backgrounder	Hyperlinked here
Community Update Letter June 17th, 2026	Hyperlinked here
Frequently Asked Questions	Hyperlinked here
Community Update Letter September 3rd, 2026	Hyperlinked here

Annex M: Waste Arrangements

Figure 105 displays a previous invoice to CRSEG related to waste disposal. CRSEG has noted that they have established a partnership with Infra Equipment Rentals Ltd., a locally licensed waste disposal company in Barbados wherein CRSEG will sort and consolidate domestic and construction waste, after which the company will collect and dispose of it.



Remit To:
Infra Equipment Rental Ltd.
Black Bess, St Peter
BB26086, Barbados, West Indies
InfraRentals.net
TIN 1000006214848

INFRA RENTALS

Paid in Full

Reservation	Invoice#
Thu 10/ 8/2026	128609-1

Customer #: 18237

CHINA RAILWAY SHANGHAI
ENGINEERING GROUP(BARBADOS)LTD
SOUTH COAST SEWAGE PLANT
CHRIST CHURCH

Date Out Thu 10/ 8/2026

Terms	Aging Date
Due upon receipt	Wed 10/ 7/2026

Fold Here

Ordered By: LI JIANLONG

Delivery Thu 10/ 8/2026 9:30AM
LI JIANLONG 246-851-3999
ENGINEERING GROUP(BARBADOS)LTD
SOUTH COAST SEWAGE PLANT
CHRIST CHURCH

Qty	Key	Items	Part#	Status	Rental Period	Price
1	SKIP 18 CU YD	RUBBISH SKIP - 18 CUBIC YARDS		Reserved	Thu 10/ 8/2026 9:30AM to Thu 12/ 3/2026 9:30AM	$480.00
2	SKIP REMOVAL-1	SKIP REMOVAL		Selling	Thu 10/ 8/2026 9:30AM to	$600.00

Figure 106: Waste Contractor Invoice