PROPOSAL FOR BEACH ENHANCEMENT AND STABILIZATION INCLUDING BOULDER REEFS, BOULDER GROYNES AND BEACH SAND TO BE BUILT IN THE NEARSHORE.

at

North of Paynes Bay to Sandy Lane, St. James.

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT.

PLANNING APPLICATION NO. 0932/07/2024C

August 2026

VOLUME 3

- **CUMULATIVE IMPACTS**
- **CONSTRUCTION IMPACTS**
- **MITIGATION AND ENVIRONMENTAL MONITORING SUMMARY**
- **ESIA CONCLUSIONS**



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1 INTRODUCTION

Volume 3 of the ESIA summarises the main findings of the impact studies and makes recommendations for mitigation and monitoring measures. This volume also includes and assessment of Cumulative Impacts as well as a framework for the Environmental Monitoring and Management Plan (EMMP).

2 CUMULATIVE IMPACTS

2.1 Introduction

A Cumulative Impact Assessment (CIA) examines a project in the context of previous, existing and proposed developments within the area surrounding the application site. A CIA will seek to determine if these cumulative impacts could be significant. This ensures that the project's potential impacts are not considered in isolation.

For this assessment, it was necessary to identify relevant development proposals within the Area of Influence (AOI) based on planning applications that have been submitted to the Chief Town Planner/Director of Planning and Development over the past fifteen years. A search of the statutory map register was undertaken at the Planning and Development Office on 28th May 2026. This research revealed that tens of applications have been submitted within the AOI within the period mentioned. Most relate to minor residential and commercial developments and are not considered relevant to this study.

The AOI is shown in Figure 2.1 below and encompasses the stretch of coastline that includes the application site together with additional stretches of coastline to the north and south.



Figure 2-1 Location of Applications Referred to In Table 2.1

2.2 Projects in Surrounding Area

Several planning applications and permissions were identified, and these are listed in Table 2.1 below. The applications relate to various types of developments, although many are associated with coastal works. This is indicative of the level of coastal erosion that has occurred over the period.

In general, those planning permissions that have been granted are consistent with the policies of the National Physical Development Plan, 2023.

CURRENT APPLICATIONS					
Satellite Ref. (see Fig. 2.1 above)	Application number	Submission Date mm/yyyy	Proposed Development	Location	Status
1	2029/11/2012C	11/2012	Construction of a Boulder Revetment	7 Grape Tree Road, Sandy Lane	Undetermined
2	1439/10/2025C	10/2025	Subdivision of Land into Lots for Residential Purposes and Reception of Dwelling House	Lots 4 and 5 Sandy Lane	Undetermined
APPROVED APPLICATIONS					
Satellite Ref. (see Fig. 2.1 above)	Application number	Permission Date mm/yyyy	Proposed Development	Location	Implemented
3	1976/12/2014C	06/2020	Construction of Breakwaters and Beach Rehabilitation	Sandy Lane and Adjacent Headlands	Partially implemented
4	0242/02/2019C	05/2025	Retention of Geotube Groyne and Sand Recharge	Lot 7, Sandy Lane	Permission for Sand Recharge only. Implemented
5	1159/08/2019C	06/2020	Biorock Reef Restoration Project	Heronetta, Sandy Lane	Unknown
6	0106/01/2022C	02/2024	Extension of Existing Terrace and Erection of two Gazebos and Associated Works	Sandy Lane Beach Club	Implemented
7	1479/10/2024C	12/2025	Retention of Beach Nourishment Works	Sandy Lane Bay	Implemented

Table 2-1 List of Applications

2.3 Potential Cumulative Impacts

The potential cumulative impacts of each of the approved developments may relate to the following.

2.3.1 Construction related cumilative impacts.

These impacts will be intensified if several projects are being carried out at the same time. However, the opposite of this scenario is where they take place one after another over several years, which can also have negative impacts on the surrounding area. The creation of jobs within the local community is a positive impact during the construction phase.

Mitigation measures will relate to proper site management and adherence to any Construction Management Plan or Sediment, Dust Control and Site Management plan required by the Director of Planning and Development.

2.3.2 Operational related cumulative impacts

These may be summarised as:

- Potential for increased traffic.
- Increased parking demand.
- Potential social impacts, both positive and negative, associated with a change in the character of the area, increased employment, beach access.
- Noise, water demand, wastewater, and marine pollution.

Mitigation measures will generally relate to those discussed within the impact assessment reports and, provided that the other developments meet the relevant standards and are implemented in accordance with their planning permissions, the potential for negative cumulative impacts will be kept to a minimum.

New development also presents an opportunity for improved beach stability, beach management, storm water management and rain water harvesting. There will be scope to reduce the potential for flooding as well as allowing for better management of the discharge of storm water into the marine environment.

3 CONSTRUCTION IMPACTS

3.1 Introduction

Construction impacts are discussed in Section 6 of the Coastal Impact Assessment included in Volume 2. These impacts relate mainly to marine environment impacts on habitat, water quality, reef habitat and turbidity/sedimentation.

Construction impacts will also occur landward of the coastline due to the need to transport materials to the site and create temporary construction access(es). Consideration must also be given to the health and safety of construction workers and the public.

The main dust receptors will be:

- Residents of the surrounding area.

- Pedestrians.
- Beach users close to the site.

3.2 Dust Impacts

The following measures are recommended to mitigate **land-based** dust construction impacts

- Stockpiles of building materials should be covered to reduce dust generation.
- A water vessel should be available and used when needed to suppress dust generation during windy periods.
- Remove materials that have the potential to produce dust from site as soon as possible, unless being re-used on site, in which case they should be covered.
- Plan site layout so that machinery and dust causing activities are located away from receptors, as far as possible.
- Erect solid screens or barriers around particularly dusty activities or around the site boundary that are at least as high as any stockpiles on site.
- Avoid site runoff of water or mud, particularly in respect of the marine environment.

Site workers may also need to be protected from dust impacts, and it is recommended that dust masks be made available for all workers.

3.3 Noise Impacts

The following measures are recommended to mitigate **land-based** noise construction impacts

- All vehicles and trucks within the work zone should be fitted with noise reducing mufflers.
- No noise generation construction activity should take place at the site before 0730 and after 1800.
- Control of delivery areas and times.
- Vehicles and mechanical plant will be maintained in a good and effective working order and operated in a manner to minimise noise emissions.
- The contractor will ensure that all plant complies with the relevant statutory requirements.
- Compressor, generator and engine compartment doors will be kept closed and plant turned off when not in use.
- All pneumatic tools will be fitted with silencers/mufflers.
- Care should be taken when unloading vehicles to avoid un-necessary noise.
- The use of particularly noisy plant will be limited, i.e., avoiding use of any such plant early in the morning.
- Plant maintenance operations will be undertaken at a distance from noise-sensitive receptors.
- Drop heights will be minimised when loading vehicles with rubble.
- Vehicles should be prohibited from waiting within the site with their engines running.
- Localised hoarding, screens or barriers should be erected to shield particularly noisy activities.

- Where site space is limited and volume of vehicles attending site is high, seek vehicle holding bay(s) to use with 'just in time' delivery management systems.
- Noise levels generated at the site should comply with the national noise policy.
- Construction and demolition activity, excluding emergency work, shall not be performed between the hours of 1800 and 0700 unless such activities can meet the limits set forth in national noise policy.

As with dust, workers also must be protected from noise, and where necessary, earmuffs should be made available to all workers who may be exposed to noise. These earmuffs should reduce but not eliminate noise altogether so that workers are still aware of the activity taking place within the vicinity.

Noise impacts will be inevitable, and the contractor should ensure that any inconvenience is kept to a minimum.

3.3.1 Sea Turtles

It is envisaged that a condition of any permission granted will require consultation with representatives of the Barbados Sea Turtle Project (BSTP) prior to the commencement of work at the site. This will help to mitigate the potential for adverse construction impacts on nesting sea turtles. The project has already commenced engagement with the BSTP.

3.3.2 Conclusion

It is important that good relations are established with those living and working within the vicinity of the worksite. The developer or contractor should communicate with neighbours on all planned works, especially for periods outside of normal working hours, where agreed. Methods of communication, as a minimum, should involve letter drops prior to and during works. Other forms of communication could include newsletters, meetings which residents or community groups can attend, notice boards, websites or social media.

The contractor will maintain a log of all complaints lodged during construction. The log should include, but is not limited to, who made the complaint; the date and time of the complaint, the nature of the complaint, how the complaint was addressed, the person responsible for addressing the issue and how the response was communicated to the complainant. This foregoing is addressed in more detail within the Social Impact Assessment in Volume 2.

It should be noted that if complaints are lodged against the development and the activities of the development are found to be the source of adverse impacts, action may be taken by the Director, Environmental Protection Department or Director of Planning and Development (DPD).

Construction impacts have been assessed for all stages of development and consideration has been given to the identified receptors. All construction projects inevitably result in negative impacts within the surrounding area and the aim therefore is to mitigate those as far as possible.

It should be further noted that the Planning and Development Board is likely to attach a condition to any permission granted requiring the submission to and approval by the DPD of a Sediment, Dust Control and Site Management Plan with respect to the construction phase.

4 STAKEHOLDER ENGAGEMENT

Stakeholder engagement has been undertaken from commencement of the project and as part of the ESIA process. Some of this engagement has been undertaken by the PDP as part of the planning application consultation process with comments being forwarded to the applicant for guidance.

The planning application was also the subject of the publicity process as required by Section 29 of the Planning and Development Act. Neighbours were notified of the proposals in writing, a sign was erected close to the site and a notice placed in The Nation newspaper. The application details were also displayed on the Planning and Development Department's website.

The Social Impact Assessment (Volume 2) includes a comprehensive Stakeholder Engagement Plan which includes the identification and analysis of stakeholders and the implementation of a community relations programme.

5 MITIGATION AND ENVIRONMENTAL MONITORING MEASURES

5.1 Introduction

This section summarises the various mitigation measures, outlined throughout this report that will be implemented during the construction and operational phases. This section also establishes the requirements of the Environmental Management and Monitoring Plan (EMMP) that will be required by condition of any permission granted for the development.

Many of the mitigation measures will be implemented through separate management plans e.g. for construction management and beach management. It may also be necessary to implement monitoring programmes to ensure that targets are being met and that legislative requirements are complied with.

5.2 Mitigation and Monitoring

The following tables summarise the main impacts for each activity/issue identified within the report for both the construction and operational phases. Mitigation measures are proposed followed by monitoring. These will feed into the EMMP.

Table 6-1 Summary of Coastal Impacts – Construction Phase

CONSTRUCTION PHASE				
Potential Impacts	Positive/Negative Short/Long Term	Reversible/ Irreversible	Proposed Mitigation	Monitoring
Employment – Job creation and continuity during construction phase.	Positive/Short Term	N/A	No mitigation required.	No monitoring required.
Potential health impacts from dust, vibrations and noise during construction.	Negative/Short Term	N/A	Mitigation through adherence to Sediment, Dust Control and Site Management Plan and Construction Methodology. Use noise reducing mufflers. Limit working hours to 0700 – 1800.	Responsibility of site manager on a day-to-day basis. Monitoring of conditions by DPD. Submission of Sediment, Dust Control and Site Management Plan to DPD.
Dust generation (land)	Negative/Short term	Reversible	Use water vessel to suppress dust generation. Issue dust masks to site workers. Cover stockpiles of building materials. Remove dust generation materials that are not being used. Issue dust masks to site workers	Responsibility of site manager on a day-to-day basis. Monitoring of conditions by DPD. Submission of Sediment, Dust Control and Site Management Plan to DPD.
Beach Habitat and Species – damage and displacement of beach habitat and species.	Negative/Short term	Reversible	• Undertake a Pre-Construction Nesting Survey to identify active sea turtle nests and nesting activity. • Nest Relocation: Where construction activities cannot avoid active nests. • Construction Timing: Where practicable, major beach works shall be scheduled outside the peak sea turtle nesting and hatching season. • Avoid Sand Compaction: Construction equipment movement on nourished beach areas shall be minimized. Placement methods shall avoid excessive compaction of beach sediments to maintain suitable nesting conditions.	Responsibility of project team and contractor. Monitoring of conditions by CZMU and DPD.

			• Controlled Equipment Access: Heavy machinery shall remain within designated construction corridors to minimize disturbance of beach habitats and vegetation. **Construction Footprint Minimization:** Temporary access routes, stockpiles, and staging areas shall be located away from sensitive habitat and native vegetation wherever feasible. A daily inspection will be conducted.	
Reef Habitat and Species – damage and displacement of beach habitat and species.	Negative/Short term	Reversible	• Controlled Equipment Access: Heavy machinery shall remain within designated construction corridors to minimize disturbance. • Coral Transplantation: Where impacts to healthy coral colonies cannot be avoided, suitable coral colonies shall be relocated by qualified marine biologists to approved receptor sites following established • Fish, Benthic and Coral Recruitment Monitoring: Colonization of the artificial reef shall be monitored to assess the success of habitat creation and ecological recovery. Changes in reef fish populations and benthic communities will be monitored to evaluate ecological performance.	Adherence to agreed Construction Methodology. Responsibility of project team and contractor. Monitoring of conditions by CZMU and DPD.
Turbidity and Sedimentation	Negative/Short term	Reversible	• Turbidity Monitoring: Turbidity levels will be monitored continuously by direct observation and turbidity meters before, during, and after in-water construction activities to verify compliance with applicable environmental thresholds and to identify the need for corrective actions if elevated turbidity is observed. • Use of Turbidity Barriers: Silt curtain, or similar enclosures, will be installed around active construction areas to contain suspended sediments and limit their dispersion into surrounding areas.	Barriers will be regularly inspected and maintained throughout construction. Adherence to agreed Construction Methodology. Responsibility of project team and contractor. Monitoring of conditions by CZMU and DPD.

			• Pre-washing of Materials: Sand, and boulder materials will be washed offsite prior to delivery. • Controlled Material Placement: Construction materials will be placed carefully using appropriate equipment and methods to minimize disturbance of the seabed and reduce the resuspension of sediments. • Construction Timing: In-water works will be scheduled, where feasible, during periods of calm sea conditions to reduce sediment dispersion and maximize the effectiveness of turbidity control measures. • Minimization of Seabed Disturbance: Construction activities will be confined to the minimum area necessary, and repeated disturbance of the seabed will be avoided wherever practicable.	
Water Quality Contamination from materials and equipment.	Negative/Short term	Reversible	Quality control procedures during the construction phase are used to limit the introduction of contaminants.	Adherence to agreed Construction Methodology. Responsibility of project team and contractor. Marine water quality monitoring and reporting. Monitoring of conditions by CZMU and DPD.
Disruption to members of the public, beach users and traffic.	Negative/Short term	Reversible	A comprehensive stakeholder communication plan will be executed, as outlined in the Social Impact Assessment (SIA), to provide timely information on project activities, construction schedules, access restrictions, environmental protection measures, and potential temporary impacts. Communication methods may include community meetings, public notices, social media updates and direct engagement with affected stakeholders. Clear signage at beach access points and other appropriate locations will be installed, informing the	Adherence to recommendations of Social Impact Assessment. Monitoring of conditions by CZMU and DPD.

			public of construction activities, restricted areas, safety hazards, and expected project timelines. Installation and maintenance of navigational lights, markers, and any other required aids to navigation on the offshore artificial reefs and associated marine structures will be undertaken in accordance with the requirements of the relevant maritime authority	

Table 6-2 Summary of Coastal Impacts - Operational Phase

OPERATIONAL PHASE				
Potential Impacts	Positive/Negative Short/Long Term	Reversible/ Irreversible	Proposed Mitigation	Monitoring
Beach Habitat and Species				
The project could result in negative or positive impacts on bech habitat and species.	Negative Short Term	Reversible	Vegetation Restoration: Coastal vegetation will be considered as part of the back of beach landscaping where feasible. Pre-existing coastal vegetation shall be restored promptly following construction. Proposed vegetation will be native coastal species.	Post development monitoring at intervals to be agree with the DPD and CZMU.
Reef Habitat and Species				
The project could result in negative or positive impacts on reef habitat and species.	Negative Short Term	Reversible	Fish, Benthic and Coral Recruitment Monitoring: Colonization of the artificial reef shall be monitored to assess the success of habitat creation and ecological recovery. Changes in reef fish populations and benthic communities will be monitored to evaluate ecological performance. Post-construction dive inspections, underwater photography, and habitat complexity assessments will be conducted immediately following construction, and as recommended by regulatory agencies. NB: The structures will be designed to avoid encroachment on existing reef habitat.	Post development monitoring at intervals to be agree with the DPD and CZMU.

Turbidity and Sedimentation				
Increased sedimentation due to the introduction of new materials to the near shore environment,	Negative/Short term	Reversible	Turbidity Monitoring: Turbidity levels will be monitored continuously by direct observation and turbidity meters before, during, and after in-water construction activities to verify compliance with applicable environmental thresholds and to identify the need for corrective actions if elevated turbidity is observed.	Post development monitoring at intervals to be agree with the DPD and CZMU.
Sea Turtles				
The proposed structures could negatively impact sea turtle nesting.	Negative/Long term	Reversible	The proposed design will create conditions more suitable for hawksbill turtle nesting through: - The re-instatement of the dry beach and increase in beach width - The proposed structures will include flow-through groynes, which typically do not have large changes in elevation and have fewer deep openings between structures. - The structures will also stabilize the beach and should lessen the potential for nests to become exposed during an erosion event. The design will incorporate coastal landscaping and vegetation where possible. • Increased coastal vegetation such as sea grape coccoloba uvifera and goat's foot yam Ipomoea pescaprae • Using naturally occurring marine sand. • Developing calmer wave climate at the shoreline • Allowing for pedestrian access for turtle conservation.	Liaise with BSTP Adherence to agreed Construction Methodology. Responsibility of project team and contractor. Monitoring of conditions by CZMU and DPD.

Water Quality				
The development could negatively impact marine water quality.	Negative Short/Long Term	Reversible	Post development marine water quality surveys will be undertaken with the results submitted to the regulatory authorities.	Post development monitoring at intervals to be agree with the DPD and CZMU.
Surfing				
There is a risk of reduced wave energy at the surf break changing the user experience.	Negative Short/Long Term	Reversible	Realignment of the structures can be considered to mitigate any post-development surfing impacts. *Note:* The design team will evaluate minor realignment of AR1 and AR3 at the detailed design stage. The intent will be to reduce the risk of impact to the identified surf breaks.	Post development monitoring in consultation with the Barbados Surfers Association.

Table 6-3 Social Impacts (Construction and Post Construction)

Social Impacts (Construction and Post Construction)				
Potential Impacts	Positive/Negative Short/Long Term	Reversible/ Irreversible	Proposed Mitigation	Monitoring
Construction: jobs create employment. Construction requires goods and services from local companies. Construction workers make purchases.	Positive/Short Term	N/A	No mitigation required	No monitoring required.
Community Health and Safety: Potential health impacts on beach users, construction work from noise and dust. Risk of accidents.	Negative/Short Term	Reversible	Preparation of Community Health and Safety Management Plan and Stakeholder Engagement Plan	Adherence Community Health and Safety Management Plan and Stakeholder Engagement Plan. Monitoring by DPD

Occupational Health and Safety: Risk of work place injuries	Negative/Short Term	Reversible	Unlikely to occur if regular OHS inspections and checks are undertaken and contractors have appropriate operational procedures in place that are enforced.	Adherence to Occupational Health and Safety Plan.
Marine and beach related livelihoods and recreation: Restricted beach access during construction, impacts on surfers, siltation in the nearshore environment, improved lateral access post construction.	Negative/Short Term	Reversible	Public Service Announcements about planned temporary restricted areas would allow users to make alternative arrangements. The turbidity curtain should contain the siltation and protect the nearshore area. Boat trip with engineers, surfers and fishers to confirm specific areas of concern to inform the design process	Monitoring by DPD and management.
Note: The Terms of Reference of the EIA specifically require that future engagement and consultation activities be planned to ensure that stakeholders remain informed about the project. To this end, it is recommended that a public relations consultant be hired to implement a stakeholder engagement process.				

5.3 Environmental Management and Monitoring Plan

An Environmental Management and Monitoring Plan (EMMP) is included within Section 6 of the Coastal Impact Assessment (Volume 2). Its purpose is to outline measures to avoid, reduce or remedy any identified negative impacts. This will include **construction** and **operational** phases. The EMMP will therefore provide assurance to stakeholders and government agencies that their requirements, with respect to environmental performance, will be met.

The broad purpose of the EMMP is to:

- Ensure that standards of good construction practice are adopted throughout the construction phase.
- Provide a mechanism for ensuring that measures to mitigate potentially adverse environmental impacts are implemented.

EMMPs provide a critical link between ESIA and project implementation. In effect, EMMPs help to implement the mitigation and monitoring programmes for the project.

In addition to the measures outlined in the Coastal Impact Assessment, the EMMP will also include the following:

- Preparation of Sediment, Dust Control and Site Management Plan for construction phase.
- Preparation of Construction Management Plan.
- Preparation of Construction Methodology.
- Reference to compliance with relevant standards e.g. planning conditions.
- Responsibilities for plan implementation.
- Staff training.
- Monitoring programme.
- Contingency plan when impacts are greater than expected.

The aim will be to:

- Enhance positive impacts.
- Avoid negative impacts.
- Minimise negative impacts that cannot be avoided.
- Resolve and fix negative impacts that cannot be minimised.

It is expected that the submission of an EMMP will be a requirement (condition) of any permission granted by the Planning and Development Board. It will include many of the issues discussed within this ESIA together with matters identified through agency and stakeholder consultation as well as public review of the ESIA. The document will be submitted for approval by the DPD.

6 CONCLUSIONS

This Environmental and Social Impact Assessment has examined the main impacts associated with the proposed coastal improvement works. None of the issues arising from the assessment

of impacts were found to be insurmountable and, in this respect, mitigation and monitoring measures have been suggested.

It must also be borne in mind that not all impacts have the potential to be negative and that there will be significant impacts of a positive nature if the project is implemented. These relate mainly to restoration of the beach along this stretch of coastline, improved public access, protection of property and protection of sea habitat.

C**onstruction impacts** will take place for a limited period and can be mitigated by following the Construction Methodology and complying with the relevant conditions of Planning Permission There will inevitably be some inconvenience to neighbouring residents and beach users, but these will only be of a short-term nature and will be offset by the overall project benefits.

Operational impacts will be addressed through the monitoring process that will be undertaken by the project team, together with any requirements included within the planning permission as recommended by the Coastal Zone Management Unit. The project team will monitor post development impacts on marine habitat, water quality, beach width and vegetation both within the application site and surrounding coastline.

This proposal will result in significant lasting benefits through beach and habitat restoration, public beach access and protection of property.

7 REFERENCES

Government of Barbados: Draft Physical Development Plan 2023

Government of Barbados: Integrated Coastal Zone Management Plan 2020

Planning and Development Act. 2019.

8 LIST OF STUDY TEAM MEMBERS

William Robert Bain - BA (Hons), BTP, MRTPI is Principal of Bain Planning and Development, a Barbados based Town Planning consultancy. He holds a Bachelor of Arts Honours degree in Urban and Regional Planning (upper second class), together with a Bachelor of Town Planning degree (commendation) and is a full Member of the Royal Town Planning Institute. He is also a member of the Barbados Town Planning Society and has previously served as its representative to the Government's Planning Advisory Committee. He has over 31 years' experience in private planning practice representing a broad range of clients in the residential, tourism, medical, agricultural, retail, quarrying, renewable energy and industrial sectors. He also has experience in the preparation of Environmental Impact Assessments and Environmental Scoping Studies for a broad range of projects including resort, quarrying, renewable energy, hospital and educational developments. Prior to relocating to Barbados in 1995, William was employed in public sector planning in the United Kingdom for 7 years.

Janice Cumberbatch Ph.D. is a lecturer in the Centre for Resource Management and Environmental Studies, University of the West Indies, Cave Hill Campus, Barbados. She has a Doctorate in Participatory Planning, and teaches courses in Environmental Planning, Professional Skills for Natural Resource Management, Environmental Impact Assessment and Sustainable Tourism.

Prior to joining CERMES, Dr. Cumberbatch was the founder and Executive Director of Social and Environmental Management Services Inc. (SEMS), a private consulting firm that offered services in the areas of social and environmental impact assessments and social surveys; social and environmental policy research; social and environmental planning; community mobilization; and seminar and workshop design and facilitation.

Previously, Dr. Cumberbatch worked for the United Nations Children's Fund (UNICEF), was the Deputy Director of a local heritage NGO, the Barbados National Trust and developed and coordinated the training portfolio for the Caribbean Natural Resources Institute (CANARI).

Dr. Cumberbatch has both academic as well as hands-on experience of environmental management and planning within the Caribbean and has worked on projects in many of the English-speaking islands including, Anguilla, Antigua, Bermuda, the Bahamas, Barbados, the British Virgin Islands, Cayman Islands, Dominica, the Dominican Republic, Grenada, Guyana, Jamaica, Montserrat, Nevis, St. Kitts, St. Lucia, St. Vincent & the Grenadines, Trinidad and Tobago and the Turks and Caicos Islands.

Dr. Cumberbatch has over 30 years professional experience in participatory research, environmental management, social impact assessment, social planning, heritage tourism management, meeting facilitation and training. She has also published several articles in the areas of environmental management, climate change, tourism, social planning and sustainable development.

W.F. Baird & Associates Coastal Engineers Limited

W.F. Baird & Associates Coastal Engineers Limited (Baird), established in 1981, is a global firm specializing in the execution of marine and coastal engineering studies and projects throughout the world. Baird is internationally recognized for the development of cost-effective and innovative solutions to complex engineering problems where water meets land, and many of our senior professional staff are internationally recognized experts in their specific fields. We pride ourselves in delivering engineering solutions that are functional, practical, durable, and resilient in the face of a changing climate.

Baird has extensive experience with metocean and coastal studies, and the planning, design, waterfront developments in urban and remote locations around the world, including a major presence in Barbados. With approximately 100 employees, Baird has the resources required to provide effective services for all stages of coastal and marine engineering projects, including field data collection, planning and environmental assessment, permitting, numerical and

physical modelling, design development, CAPEX and OPEX estimates, project tendering, construction administration management/observation, and post-construction monitoring.

Using our "One Team Worldwide" approach, Baird's regional offices in Barbados and Jamaica are able to draw on the full range of resources available from our global team with a wealth of experience on shoreline and beach development projects throughout the Caribbean and beyond. A few of our most relevant projects are listed below:

- Sandals Casuarina beach upgrade – planning, design, permitting, and construction administration for a major beach upgrade for Sandals at Casuarina beach in Maxwell, on the South coast.

- Heron Bay / Queens Fort – major beach upgrade on the West coast of Barbados, including offshore breakwaters and beach nourishment.

- Holetown Waterfront and Folkstone Marine Park – waterfront development, including pocket beaches, breakwaters, and armour rock revetments supporting a walkway along the waterfront.