

8.0 ENVIRONMENTAL MONITORING PLAN

8.1 GENERAL

An environmental monitoring plan provides feedback about the actual environmental impacts of a project and helps to judge the adequacy of the mitigation measures in protecting the environment. The purpose of environmental monitoring is to evaluate the effectiveness of implementation of the Environmental Management Plan (EMP) by periodically monitoring the important environmental parameters within the impact area, so that any adverse effects are detected and timely action can be taken.

8.2 OBJECTIVES OF THE ENVIRONMENTAL MONITORING PLAN

The key objective of the environment monitoring program will be as follows:

1. Ensure compliance with the mitigation measures as identified in the ESIA;
2. Determine the project's actual environmental impacts so that modifications can be made to the project's mitigation measures;
3. Describe the extent of environmental effects and resource losses;
4. Provide scientific information about the response of an ecosystem to a given set of human
5. activities and mitigation measures;

8.3 SUGGESTED ENVIRONMENTAL MONITORING PLAN

The environmental monitoring plan for the proposed beach Hotel development has been conceptualized in view of the institutional, scientific and fiscal issues pertaining to the project. The monitoring plan aims to collect data on the environmental indicators to provide information about the environmental impacts. For developing the monitoring plan, appropriate components which are likely to be affected have been identified. For each component, suitable measurable environmental indicators which are appropriate to the impact mechanism and scale of disturbance and which have a low natural variability, broad applicability and an existing data

series have been defined. The monitoring plan has been designed for the construction and the operation phase of the project and the details of the plan have been presented in Table 8.1.

Table 8.1: Recommended Environmental Monitoring Plan

Item No.	Performance Indicator	Ambient air Quality	Parameters	Locations	Frequency
Preconstruction Phase					
1	Concentration of SPM to assess the effectiveness of dust control measures	Ambient Air Quality	PM _{2.5} and PM ₁₀	Project site	Quarterly
					Quarterly
Construction Phase					
1	Oil and grease, heavy metal concentration	Soil Quality	pH, electrical conductance, cation exchange capacity, Sodium Absorption	One location within project site	Annually

			Ratio (SAR), water holding capacity, phosphorous, Copper, Zinc, iron, calcium, magnesium, sodium, potassium, boron, Nitrogen, porosity, permeability, infiltration capacity, bulk density, organic content texture, etc.,		
2	Concentration of SPM to	Ambient Air Quality	PM _{2.5} and	Project site	Quarterly

	assess the effectiveness of Dust control plan	Emissions from DG set	PM10		
3	Equivalent noise level	Ambient Noise Quality	Hourly Leq	Project Site	Monthly
			Noise emissions from DG set operation during construction work		Monthly
Operational Phase					
1	Ground water table level	Strom Water Management Plan	Ground water table	Near storm water storage tank	Twice in a year
2	Greenbelt survival rate	Greenbelt development plan	Greenbelt	At the greenbelt development corridor	Twice in a year
3	% Savings of energy	Energy conservation measure	Rating of energy consumption	At all installation	Half Yearly

4	Potability, taste, odour	Groundwater Quality	Parameters as listed in WHO Vol:3, guidelines for Drinking water (1997)	Water intake structure	Half Yearly
5	Efficiency of the STP (%)	Treated effluent Quality	pH, Color, Odor, Turbidity, EC, Alkalinity , Hardness, BOD, COD, Total Dissolved Solids, Suspended Solids, Total Coliform, Volatile solids , Heavy Metals	STP Outlet	Twice a month for 1st three months, monthly for next three months and quarterly

8.3.1 Data Analysis

The monitored data will be analysed and compared with baseline levels as established by regulatory standards as specified by the Government of Barbados EPD. The standards against which the different environmental components will be compared are shown in table 8.2 below.

Table 8.2: Standards For Different Environmental Components

Item No.	Component	Applicable Standards
1	Ambient Air Quality	NAAQS, CPCB/WHO
2	Noise Quality	AAQSRS, CPCB/WHO
3	Surface water Quality	WHO
4	Ground Water Quality	WHO
5	Soil Quality	Approved by EPD
6	Treated sewerage water Quality	BWA

8.3.2 Reporting Schedule

The monitoring results of the different components will be analysed and compiled every six months during the construction phase and yearly during the operation phase. The report will also list the project activities along with the environmental mitigation measures and will evaluate the efficiency of the EMP.

8.3.3 Emergency Procedures/ Corrective Measures

Corrective measures will be adopted if the review of the monitoring report reveals that the environmental management plan is inadequate or has not been implemented properly. A detailed review will be carried out by the interdisciplinary team of experts in the Environment Management Cell for assessing the gaps in the EMP and the addressing of the EMP. A corrective

action plan will be worked out for the environmental component and a rigorous follow up of environmental monitoring plan will be carried out.