

**ANNEX I**

**PALM HARBOUR**

**TERMS OF REFERENCE**

**(TOR)**

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**FOR AN EIA TO BE PREPARED FOR A PROPOSED TOURISM (RESIDENTIAL)**  
**PROJECT FOR PALM HARBOR - HANEY FARMS LOCATED IN THE STANN**  
**CREEK DISTRICT, BELIZE**

This Terms of Reference (TOR) has been prepared following the revision of a layout plan presented to the Department of the Environment (DOE), wherein the scoping for the most critical issues, that will need to be addressed by the proposed development were established.

In the preparation of the Environmental Impact Assessment (EIA), the EIA preparers will need to focus on addressing the main areas of concern, such as:

**WATER RESOURCES, LIQUID WASTES, SOLID WASTE, ENERGY GENERATION, TRANSPORTATION, EXTRACTION OF MATERIALS, AND SOCIO-ECONOMIC FACTORS, POSSIBLE SILTATION, CHANGES IN POPULATION DYNAMICS.**

Scoping of these issues speeds up the EIA process, cuts down its cost, improves the quality of the development, and ensures that environmental concerns are clearly addressed.

This Term of Reference (TOR) is divided into three (3) sections:

**A. PROJECT DESCRIPTION AND PHYSICAL ENVIRONMENT**

This section of the EIA deals primarily with information pertaining to the background of the project, and the physical environment within which it is proposed. The EIA will need to address:

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**1.0 THE PROJECT DESCRIPTION AND LAYOUT PLAN**

Maps at appropriate scales must be provided and with proper labels and legends to illustrate the general settings of project related development sites as well as surrounding areas likely to be environmentally affected. These maps shall include topographic contours, where available, as well as location of major surface waters, natural drainage, roads, parks or reserves, political boundaries and existing adjacent land uses (tourism, agricultural, industrial) and a photo-geologic/geomorphic map of the project area showing geomorphic features (by use of aerial photographs, if available). Additionally the following should be provided:

- 1.01 Give project location and ownership.
- 1.02 Provide the following plans:
  - a. The layout plan for the overall development, including siting of all facilities such as the utilities, water treatment facilities, sewage treatment facilities,

storage facilities, drainage facilities, residential subdivision (including lagoon front and coastal), marinas and pier, power generation, battery/fuel storage facilities, recycling/composting facilities, garbage storage/treatment facilities, etc.;

- 1.03 Describe briefly the facilities provided in the plans above (1.02 a).
- 1.04 The physical plan for the development, including the siting and rationale of all facilities and infrastructure.
- 1.05 Provide specifications for the following:
  - a. Water Resources and Energy Generations
  - b. Waste Treatment facilities; (liquid and solid)
  - c. Recreational sites
  - d. Dredging and Reclamation Activities, volumes
  - e. Marina
  - f. Canals and manmade lagoons (location, depth, width and design), including over the water structures
  - g. Tourism facilities
- 1.06 Provide outline of the overall management structure anticipated for the proposed development.
- 1.07 Describe the existing aquaculture ponds and describe their use/relevance to this project.
- 1.08 Describe the implementation of the project in phases (if applicable).

## **2.0 THE PHYSICAL ENVIRONMENT**

- 2.01 Provide details of the basic physical environment of the project site and zone of influence. This should include:
  - ◆ Topography: including degree of slopes, flood hazard, drainage patterns around project site and the effects of rainfall averages on these conditions
  - ◆ Climate, hydrology and meteorology: including rainfall average per year, prevailing wind patterns,
  - ◆ Geology:
    - o Geomorphology — detailed description of the characteristics of landforms; (detailed description of land surface including exposed rock types, types of unconsolidated materials exposed (sediments),

rivers, lagoons, tributaries, ridges, and geological structures — faults, folds, if they can be determined by field mapping)

- ◆ Soils: soil profile, permeability, classification, fertility, agricultural value;
- ◆ Current land use of project site and adjacent properties;
- ◆ Physical description of surrounding receiving water bodies including creeks, lagoons

2.02 Determine the projected number of residential lots including lagoon front properties. A layout of all complexes and other infrastructure to be built and the proximity to each other should be shown.

2.03 Provide technical justification for the number of residential lots, number of persons residing and visiting the project site. This should be described in such a way as to determine the physical carrying capacity of the area.

### **3.0 POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK**

3.01 Describe the pertinent regulations, standards and policies, at the local and national, levels, governing environmental quality, health and safety, protection of sensitive areas, including cultural resources, protection of endangered or threatened species, infrastructure development, land use control and tourism that may have an impact on the proposed development.

## **B. ENVIRONMENTAL ISSUES**

This section of the document primarily targets the environmental issues of critical concerns based on information provided in section A.

The following are the critical issues a high quality EIA will need to address for this development. The EIA will need to address:

### **4.0 FLORA AND FAUNA**

For the project site and the zone of influence:

4.01 Describe the terrestrial and aquatic fauna and flora on the project site, with special emphasis on water bodies proposed as water supply. This should provide a baseline from which to detect any changes in the abundance and vigor of the species due to this development.

4.02 Provide a general description of the methodology used to collect baseline data this is to include the date, time, area surveyed and method used.

4.03 Estimate the acreage and type of vegetation to be cleared, if any.

- 4.04 Identify any species of conservative significance, and specify measures for their protection.
- 4.05 Highlight, where appropriate, measures that could be taken to enhance the habitat value of the project area.

## **5.0 WATER RESOURCES**

- 5.01 Establish a base line on the water resources of the project area. This base line should include water quality assessment of the ground water and surface waters of the project site and zone of influence. This data should be collected at appropriate intervals to establish any seasonal variation in the water quality between dry and rainy season. The base line should include, at a minimum, the following parameters:
  - Temperature
  - Salinity
  - Ph
  - Hardness/Conductivity
  - Total Suspended Solids
  - Dissolved Solids
  - Biological Oxygen Demand
  - Dissolved Oxygen
  - Sulphates
  - Total Nitrate
  - Total Phosphate
- 5.02 Determine the projected water needs for the entire development (including drinking water supplies, supply to household, irrigation of lawns and other uses.
- 5.03 Assess all sources of water supply, quality and quantity, paying special attention to determining the safe maximum sustainable yield it can provide.
- 5.04 Given the results from above, evaluate alternatives for the provision of water supply for the entire development.
- 5.05 Identify the preferred option for water supply required for project development, based on environmental grounds. Where the recommended water supply source is ground water, a proper pump test on the aquifer must be conducted. Specify any residual impacts of meeting water needs through this option, their significance, and any mitigatory measures to be undertaken.
- 5.06 Identify and develop a water quality monitoring programme able to detect any change in groundwater or surface water quality that will be of significant detriment to:
  - i. Public health; and
  - ii. Forest, and adjacent habitats, including water bodies

## **6.0 LIQUID WASTE**

- 6.01 Determine the nature and volume of liquid waste to be generated by the entire project, including sewage and grey water.
- 6.02 Evaluate a minimum of three alternative options for the collection, treatment, recycling (if appropriate), and disposal of these liquid wastes. Be sure to identify any chemicals planned for use in the treatment or management of these wastes, including golf course maintenance.
- 6.03 Identify the preferred option(s) for liquid waste management, based on environmental grounds, including necessary infrastructure and land requirements. Specify any residual impacts of liquid waste management, their significance, and any mitigation measures to be undertaken.

## **7.0 SOLID WASTE GENERATION**

- 7.01 Determine the projected types and volumes of solid waste to be produced by the entire development. This should include organic, inorganic and construction waste (field waste). If composting of organic wastes is to be conducted, provide specifications on the location of the site and procedures to be followed for the composting.
- 7.02 Evaluate at least two alternative options for the collection, treatment and disposal of these wastes.
- 7.03 Select the preferred option/s for disposal of these materials. Again, this should be based on environmental grounds, and should specify any residual impacts, their significance and the mitigatory measures, which are to be undertaken. Should the EIA determine that the construction of an on-site landfill is to be the preferred option, the EIA should include a study to determine the most suitable site for the construction of the landfill and detailed designs of the proposed landfill.
- 7.04 Determine if any waste minimization strategy can be employed by the developer to reduce the types and volumes of solid waste being produced. State whether any conservation measures will be implemented including environmental awareness.

## **8.0 GEOLOGY AND EXTRACTION OF MATERIALS**

- 8.01 Provide information on the specific soil type and submit results of analysis carried out to determine soil permeability/profile in the proposed project area.
- 8.02 Conduct at least three bores of a diagonal transect of the residential area for the reconfirmation of bedrock for structural support.
- 8.03 Determine the type and volume of construction materials required for the entire development.

- 8.04 Consult with the Geology and Petroleum Department over fulfilling requirements for a quarry/mining license, which will be required before any dredging/mining commences.
- 8.05 In light of this consultation evaluate options for meeting these needs, reviewing their sources, volume, extraction methods and transportation and identifying;
  - 8.05.1 direct and indirect biological impacts;
  - 8.05.2 direct and indirect physical impacts (eg. forest processes);
  - 8.05.3 impact on water resources;
  - 8.05.4 specific mitigation measures
- 8.06 Identify the preferred option for the extraction methods, source, and transportation of materials, specifying the necessary mitigation measures, their residual impacts and significance.

## **9.0 TRANSPORTATION**

### **9.01 Roads Transportation**

- 9.01.1 Provide a layout of the existing access road(s)/walkways to the development site. Identify whether any new roads/walkways will be required for the development.
- 9.01.2 Identify any changes in drainage patterns, if applicable
- 9.01.3 Evaluate options for the provision of suitable roads/walkways for the development, taking into account proper access to lots, etc.
- 9.01.4 Select preferred option for the provision of suitable roads/walkways for the development. This will need to examine construction materials (types, sources, volumes, transportation) and methods in relation to their environmental impacts.
- 9.01.5 Identify the preferred option for surface drainage system for the project area, including drains, culverts, bridges, and sedimentation structures and run off ponds.
- 9.01.6 Recommend mitigation measures, based on the specific option selected, for the proper management of the vehicular/boat traffic close to and within the project area. These mitigation measures must include recommendations for protection features against siltation, erosion, and other potential pollution to the environment.

### **9.02 Water Transportation**

- 9.02.1 Determine the projected number and types of boats likely to be associated with the entire development.

9.02.2 Evaluate options for storage of water borne vessels, (if applicable). This will require examination of:

- i. *Dredging requirements/volume of materials to be dredged;*
- ii. *Disposal/use of dredged materials;*
- iii. *Physical characteristics of materials to be dredged;*
- iv. *Benthic substrate*
- v. *Design of marina facility, including access channel;*
- vi. *Type of dredging equipment;*
- vii. *Need for shoreline protection;*
- viii. *Near shore and off shore current patterns;*
- ix. *Near shore and off shore sedimentation patterns;*
- x. *Wind conditions;*
- xi. *Wave conditions;*
- xii. *Transportation of construction materials;*
- xiii. *Methods of controlling sedimentation of marina;*
- xv. *Requirement for maintenance dredging (frequency & volume)*
- xvi. *Estimated flushing rate for the proposed marina.*

The plan of the marinas/piers/docks must include dimensions to scale (e.g. length, height, width, etc.) for all related structures both, land and water based, berthing and mooring arrangements as well as the specific siting for the various facilities such as fuel dispensing (if applicable), etc. Text accompanying the plan must be submitted with justification for the size and scope of the pier and details on the type, size and number of vessels. Provide information on alternative sites considered and the rationale for the selection of the proposed site and design as the preferred choice.

9.02.3 Provide bathymetric data of the lagoon to be dredged in particular the access channel and the marina /pier area.

9.02.4 Evaluate options for the construction of coastal protection structures/devices and identify the preferred option (if applicable).

9.02.5 Evaluate options for the supply of fuel to boats and identify the best method for eliminating potential spillages and maximizing health and safety. This should include options for the proper storage of the fuels.

## **10.0 DISASTER MANAGEMENT AND CLIMATE CHANGE ISSUES**

10.1 Identify emergency preparation and response management measures for the proposed development (e.g. hurricane, floods, fires, medical etc.). This should include evacuation and hazard management plans inclusive of climate change adaptation measures (such as sea level rise and structural/building design

conducive with the climatic conditions of project site.) This should include the number of emergency vehicles needed for the development.

## **11.0 ENERGY GENERATION**

- 11.01 Determine the projected energy requirements for the entire development.
- 11.02 Evaluate alternatives for meeting these needs, using fossil fuel, solar, wind resources (and others if appropriate). For each of these options, it will be necessary to investigate:
- 11.02.1 Fuel storage (where relevant);
  - 11.02.2 Transportation (where relevant);
  - 11.02.3 Health and safety;
  - 11.02.4 Pollution sources, volumes, and types;
  - 11.02.5 Significance of any pollution that may result from energy generation; and
  - 11.02.6 Mitigatory measures

It will be necessary to divide examination of energy provision into construction, operation, and maintenance phases.

- 11.03 Select the preferred option for energy generation. Again, this should be based on environmental grounds, and should specify the residual impacts of generation of the preferred option, their significance and the mitigatory measures, which will be undertaken.

## **12.0 SOCIAL FACTORS**

- 12.01 Conduct an investigation to determine the potential social impacts of the proposed development taking into account factors such as:
- 12.01.1 Labor; - employment opportunities for skilled and unskilled workers for example in the hotel industry or in the gaming industry; and provision of basic health care and hygiene, the provision of recreational spaces, sanitary facilities for all workers, during construction and operation of the project.
- 12.02 An analysis of the requirements of areas for public services should be incorporated into this study. Issues such as the following should be addressed;
- i. Fire protection
  - ii. Police/Security services
  - iii. Educational institutions
  - iv. Recreational centers
  - v. Medical emergency evacuations

12.03 Identify emergency preparation and applicable management measures for the proposed development (e.g. hurricane, floods, fires etc.). This should include evacuation and hazard management plans inclusive of climate change adaptation measures.

### **13.0 ARCHAEOLOGY**

13.01 Consult with the Institute of Archaeology on the need for an archaeological assessment of the proposed project site. Include a copy of the approval/recommendations from the Institute of Archaeology and integrate them into the overall development plan.

### **14.0 NGO AND PUBLIC INTEREST**

14.01 The EIA team will report on the views and concerns of local NGO's, public interest groups and relevant government departments/agencies regarding the development of the project.

14.02 Provide a copy of the questions/answers used for the report including the name and organization of all the interviewees and the date of interview.

### **15.0 SUBDIVISION COMPONENT**

15.01 Indicate the acreage of the parcel of land to be subdivided, and the proposed sized (surface area) of the individual lots.

15.02 Provide a "code of restrictive covenants" for future land owners, to assist in ensuring their compliance with the intended development plan for the area. These codes should focus on various issues, especially on environmental protection and enhancement.

## **C. CONCLUSIONS / RECOMMENDATIONS**

This section proposes alternatives to the execution of the project based on the information generated by Section B.

### **16.0 ALTERNATIVES FOR DEVELOPMENT**

16.01 Present all reasonable alternatives for development in comparative form, exploring each alternative. Include the no-action alternative, and the reason why certain alternatives were recommended or eliminated.

### **17.0 MITIGATION AND MONITORING PLAN**

17.01 Based on the investigations, develop a mitigation matrix outlining mitigation

measures for all potential negative environmental impacts including, but not limited to: construction activities, water abstraction, waste treatment and disposal, and habitat alteration, erosion.

17.02 Provide a monitoring plan to be implemented for the entire operation. This should include monitoring of waste water discharge characteristics (if any), water abstraction levels and changes in ecological species (including endangered species).

17.03 Identify all significant changes that may result from the implementation of the project. This should include, but not be limited to, changes in the following:

- i. Wastewater;
- ii. Land Use;
- iii. Traffic;
- iv. Infrastructure;
- v. Employment opportunities;
- vi. Socio-cultural environment; and
- vii. Abundance of flora and fauna.

17.04 Characterize the extent and quality of available data, explaining significant information deficiencies and any uncertainties associated with the prediction of such impacts.