TERMS OF REFERENCE
ENVIRONMENTAL IMPACT ASSESSMENT FOR
3 MW WIND TURBINE PROJECT

1. INTRODUCTION

The Jamaica Public Service Company Limited (JPS) is the electric utility for the island of Jamaica. (JPS) will be developing a 3 MW wind project in the Munro environs.

These terms of reference are to guide the environmental impact assessment (EIA) that is necessary for the requisite permits in accordance with the national environmental regulations.

2. PROJECT BRIEF

The project will include construction and installation of four (4) 750 kWh wind turbines in Munro.

SITE LOCATION

The general site is in the Hermitage area in St. Elizabeth.
TERMS OF REFERENCE

The Terms of Reference (TOR) for conducting the EIA are based on the General Guidelines for Conducting EIAs (NEPA revised 2007) for prescribed categories under the NRCA Act.

The Environmental Impact Assessment will include but not necessarily be limited to:

1) Project Objectives
2) Complete description of the existing site proposed for development.
3) Significant environmental issues of concern through the presentation of baseline data, which should include social, cultural and heritage considerations. Assess public perception of the proposed development.
4) Policies, Legislation and Regulations relevant to the project.
5) Likely impacts of the development on the described environment, including direct, indirect and cumulative impacts, and their relative importance to the design of the development’s facilities.
6) Mitigation action to be taken to minimise predicted adverse impacts if necessary and quantify associated costs.
7) Monitoring Plan that should ensure that the mitigation plan is adhered to.
8) Alternatives to the project that could be considered at that site or at any other location including no action alternative.
9) Conclusions

To ensure that a thorough environmental impact assessment is carried out, it is expected that the following tasks be undertaken:

Task # 1 - Description of the Project

Provide a comprehensive description of the project and the surrounding environment specifying any information necessary to identify and assess the environmental effects of the project. This should include project objectives and information on, rationale for the project and background, the nature, location/existing setting, timing, duration, frequency, general layout including construction of any additional power lines and their impacts on the surroundings communities, as well as the impact of the turbines on the power supply and carbon footprint of the energy sector are to also be discussed, pre-construction activities, construction methods, works and duration, and post construction plans. A description of raw material inputs, technology and processes to be used as well as products and by-products generated, should be provided. Note areas to be reserved for construction and areas to be preserved in their existing state as well as activities and features which will introduce risks or generate impact (negative and positive) on the environment.

Task # 2 - Description of the Environment/Baseline Studies Data Collection and Interpretation

Baseline data will be generated in order to give an overall evaluation of the existing environmental conditions, including a historical meteorological evaluation to include but not be limited to wind characteristics and analysis, values and functions of the area, as follows:
i.) physical environment  
ii.) biological environment  
iii.) socio-economic and cultural constraints

It is expected that methodologies employed to obtain baseline and other data be clearly detailed. Baseline data will include:

**Physical**

i.) A description of the existing soil and geology, landscape, aesthetic values and hydrology. Special emphasis should be placed on storm water run-off, drainage patterns, and aquifer characteristics. Any slope stability issues that could arise should be thoroughly explored.

ii.) Water quality of any existing wells, rivers, ponds, streams or coastal waters in the vicinity of the development.

iii.) Coastal and Marine ecosystem, including but not limited to any wetlands including mangroves, seagrass and coral community with indication of its function and value in the project area.

iv.) Noise levels of undeveloped site and the ambient noise in the area of influence

v.) Obvious sources of existing pollution and extent of contamination

vi.) Availability of solid waste management facilities

**Biological**

Present a detailed description of the flora and fauna (terrestrial and aquatic if applicable) of the area, with special emphasis on rare, threatened, endemic, protected and endangered species. Migratory species, wild food crop plants and presence of invasive alien species should also be considered. There may be the need to incorporate micro-organisms to obtain an accurate baseline assessment. Generally species dependence, habitats/niche specificity, community structure and diversity ought to be considered.

**Socio-economic & cultural**

Present and proposed land use; transportation of heavy equipment, road widening and associated traffic considerations particularly in the construction phase of the project, planned development activities; issues relating to squatting and relocation; public health and safety. The historical importance (heritage, archaeological sites and feature) and other material assets of the area should also be examined. While this analysis is being conducted, it is expected that an assessment of public perception of the proposed development be conducted. This assessment may vary with community structure and may take multiple forms such as public meetings and/or questionnaires/surveys.

**Task #3 - Policy, Legislative and Regulatory Considerations**

Outline the pertinent regulations and standards governing environmental quality, safety and health, protection of sensitive areas, protection of endangered species, siting and land use control at the national and local levels. The examination of the legislation should include at minimum, legislation such as the NRCA Act, the Public Health Act, the Town and Country Planning Act and the appropriate international convention/protocol/treaty where applicable.
Task # 4 - Identification and Assessment/Analysis of Potential Impacts

Examine and identify the major potential environmental and public health issues of concern and indicate their relative importance to the development project. These should include the occupational exposure, health and safety measures and population exposure in the appropriate study area(s) and changes and or enhancement in emergency response plan. Identify potential impacts as they relate to, (but are not restricted by) the following:

- change in drainage patterns
- flooding potential if necessary
- landscape impacts of excavation and construction
- loss of and damage to geological and palaeontological features
- loss of species and natural features
- habitat loss and/or fragmentation
- biodiversity/ecosystem functions including impacts of bird and bat mortality
- pollution of potable, surface or ground water
- air pollution
- socio-economic and cultural impacts
- impact of flooding, loss of natural features, excavation and construction on the historic landscape, architecture and archaeology of the site
- risk assessment
- noise and vibration, EMF
- solid waste disposal
- soil
- change in land use
- visual impacts – aesthetics
- impact on traffic associated with road widening and the transportation of heavy equipment to the site

Distinguish between significant positive and negative impacts, direct and indirect, long term and immediate impacts to include discussion on site restoration and residual impacts and the proposed mitigation measures. Identify avoidable as well as irreversible impacts. Cumulative impacts of this and other proposed and/or existing developments will be explored.

Characterize the extent and quality of the available data, explaining significant information deficiencies and any uncertainties associated with the predictions of impacts. A major environmental issue is determined after examining the impact (positive and negative) on the environment and having the negative impact significantly outweigh the positive. It is also determined by the number and magnitude of mitigation strategies, which need to be employed to reduce the risk(s) introduced to the environment. Project activities and impacts will be represented in matrix form.
Task #5 - Drainage Assessment

An assessment of Storm Water Drainage should be conducted. The EIA Report will cover but not be limited to where necessary:

i.) Drainage for the site during construction to include mitigation for sedimentation to the aquatic environment

ii.) Drainage for the site during operation, to include mitigation for sedimentation to the aquatic environment

iii.) Drainage control for crossings of rivers and/or gullies, to include impacts that drainage control features could have on aesthetics, water quality and sedimentation of rivers and/or gullies.

Task # 6 Mitigation & Emergency Preparedness and Response

Prepare guidelines for avoiding or reducing (e.g. restoration and rehabilitation), as far as possible, any adverse impacts due to proposed usage of the site and utilising of existing environmental attributes for optimum development. The potential impacts on aircrafts in the area should be addressed. Quantify and assign financial and economic values to mitigating methods.

Indicate the emergency preparedness and response plans for dealing with risks and hazards identified at Task 4.

Task # 7 - EHS Management and Monitoring Plan

Design a plan for the management of the natural, historical and archaeological environments of the project to monitor implementation of mitigatory or compensatory measures and project impacts during construction and occupation/operation of the units/facility. An EHS Management Plan and Historic Preservation Plan (if necessary) for the long-term operations of the site should also be prepared.

An outline of a monitoring programme (if necessary) should be included in the EIA, and a detailed version submitted to NEPA for approval after the granting of the permit and prior to the commencement of the development. At the minimum the monitoring programme and report should include:

- An introduction outlining the need for a monitoring programme and the relevant specific provisions of the permit and/or licence(s) granted.
- The activity being monitored and the parameters chosen to effectively carry out the exercise.
- Project maintenance and decommissioning
- The methodology to be employed and the frequency of monitoring.
- The sites being monitored. These may in instances, be pre-determined by the local authority and should incorporate a control site where no impact from the development is expected.
- Frequency of reporting to NEPA
Task #8 - Project Alternatives

Examine alternatives to the project including an assessment of the impacts of all the alternatives examined and the no-action alternative. This examination of project alternatives should incorporate the use history of the overall area in which the site is located and previous uses of the site itself.

Task #9 - Public Participation/Consultation Programme

Conduct public presentation(s) on the findings of the EIA to inform, solicit and discuss comments from the public on the proposed development if necessary.

- Document the public participation programme for the project.
- Describe the public participation methods, timing, type of information to be provided to the public, and stakeholder target groups.
- Summarise the issues identified during the public participation process
- Discuss public input that has been incorporated into the proposed project design; and environmental management systems

Task #10 – Energy Statement

Examine the Government National Energy Policy and renewable projects. Discuss briefly the Munro Wind Project in relation to the National Energy Policy.

THE EIA REPORT

All Findings will be presented in the EIA report. The report will contain an introduction explaining the need for, and context of the project. The report should, at a minimum, cover the following basic aspects:

- Executive Summary
- Policy, Legal and Administrative Framework
- The EIA Methodology
- Description of the Existing Environment
- Description of the Proposed Project in detail
- Identification and Assessment of Potential Direct, Indirect, Cumulative, Positive and Negative Environmental Impacts
- Physical
- Natural Hazard Risk
- Biological
- Heritage - Cultural and Historic Heritage Sites
- Human/Social
- Public Involvement
- Recommended Mitigation Measures
- Identification and Analysis of Alternatives
- Management of the Environmental and Heritage aspects of the Project
- Environmental Management of the Project
☐ Environmental Quality Objectives
☐ Training
☐ Draft Outline Monitoring Programme
☐ List of References
☐ Appendices including:
  ▪ Reference documents
  ▪ Photographs/ maps/ site plans
  ▪ Data Tables
  ▪ The study team including Technical Team – name, qualifications and roles
  ▪ TOR
  ▪ Notes from Public Consultation
☐ Glossary of Technical Terms used

Fourteen hard copies and an electronic copy of the report will be required for submission to the National Environment and Planning Agency.