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**SUSTAINABLE AKKAR SAL**

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# ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

# SUSTAINABLE AKKAR WIND FARM. LEBANON

# 1. INTRODUCTION

The purpose of this ESMP is to specify the standards and controls required to manage and monitor environmental, social and health and safety impacts of the Project during construction and operation phase in accordance with the applicable national legislation and regulations and lender standards. The health, safety and security aspects are included as a separate section of the ESMP.

To achieve this, the ESMP identifies potential adverse impacts from the planned activities and outlines mitigation measures required to reduce the likely negative effects on the physical, natural and social environment, and manage health and safety risks. It provides an overview of the environmental and social baseline conditions of the Project's Area of Influence, summarizes the potential impacts associated with the proposed development works and sets out the management measures required to mitigate any potential impacts in a series of discipline specific Environmental and Social Management Plan (ESMP) sections. In the risk register completed for the Project (see **Section 21** of the ESIA Report) the potential health, safety and security risks for the project have been assessed and control measures identified.

This ESMP is to be implemented by the selected Original Equipment Manufacturer (OEM)/Engineering, Procurement and Construction (EPC) Contractor to be commissioned by SA for the Project. Implementation and management of certain plans, i.e. the Stakeholder Engagement Plan and Grievance Mechanism, will remain the responsibility of SA.

## 1.1. Objectives of the ESMP

The ESMP is a Project-specific source document detailing the environmental, social protection and health, safety and security requirements to mitigate and minimize the adverse impacts. The ESMP's objective is to ensure that the environmental requirement, social commitments, and health and safety risks associated with the Project are carried forward into the construction and operational phases of the Project and are effectively managed. The specific objectives of this ESMP are as hereunder:

- Provide an institutional mechanism with well-defined roles and responsibilities for ensuring that measures identified in ESIA are implemented.
- Minimizing any adverse environmental, social and health and safety impacts resulting from the Project activities by implementing all suggested mitigation measures and control technologies, safeguards identified through the ESIA process.
- Prevent or compensate for any loss of the affected persons.
- Conducting Project activities in accordance with relevant Lebanese Laws and the international guidelines.
- Prevent environmental degradation resulting from individual subprojects or their cumulative effects.
- Enhance positive environmental and social outcomes.
- Ensure that the ESMP is feasible and cost-efficient.
- Provide a Project monitoring program for effective implementation of the mitigation measures and ascertain efficacy of the environmental management and risk control systems in place.
- Ensure that all stakeholders concerns are addressed.

### 1.2. Policies, Legal and Administrative Framework

This ESMP was developed following the requirements and conditions set by the MOE in their response to the Scoping Report. The main national legal framework which is considered in the framework of this ESIA are the following:

- Law 444/2002 related to Environment Protection, and its related Application Decree No. 8633/2012 on the Fundamentals for Environmental Impact Assessment.
- Law 462/2002 related to the Electricity Sector which sets up the rules and principles governing the Electricity sector, with the aim to bringing in the private sector as a partner in power generation in Lebanon. This law was further updated in 2014 by Law 288.
- Law 48/2017 related to Public Private Partnership (PPP) that encourages private sector investments in the public sector.
- Application Decree 2366/2009 related to the National Physical Master Plan for the Lebanese Territory (NPMPLT) covering land use and zoning of lands.
- MOE Decision No. 52/1 of 29 July 1996 setting air quality standards, including thresholds for air pollutants and safe noise exposure limits.

Further, all development projects must adhere to the environment quality standards for air, water and soil (MOE Decision 52/1 of 1996) as well as to air emission standards and wastewater discharge (MOE Decision No 8/1 of 2001).[1] In addition, the following international guidelines apply (together with the Lebanese legislative requirements, referred to as 'the Applicable Standards'):

- International Finance Corporation (IFC) Performance Standards (PSs).
- Environmental and Social Standards (ESSs) of the European Investment Bank (EIB)
- International best practice, policies and guidelines including:
  - IFC's General Environmental, Health, and Safety (EHS) Guidelines (2007).
  - IFC's EHS Guidelines for Wind Energy (2015).
  - IFC's EHS Guidelines for Toll Roads (2007).

Further, public participation ensures that the concerns of all stakeholders are clearly documented and thus addressed as part of the decision-making process of the Project. Public participation and engagement are integral to the ESIA process and a pre-requisite of the national EIA regulations in Lebanon as well as the other Applicable Standards followed by the Project. For the EIA report, Article 12 of the decree related to "Information Publication" confirms the right of the public and the parties involved in the project to have access to the final EIA Report. Moreover, Law 28 of 2017 on the Right to Access to Information has confirmed the right of any person, to access to information and documents available within the administration.

As such, the national regulations require an initiation of the consultation process supporting public participation at the outset of the EIA/ESIA process and allow continuous access to information related to the Project, which applies and is to be sustained throughout the construction and operations phases of the Project.

[1] The Minister of Environment's decision No. 8/1-2001, Setting national standards and criteria regarding air pollutants and liquid wastes generated by classified establishments and wastewater treatment plants.

# 2. ORGANIZATIONAL STRUCTURE

To ensure the efficacy of the Environmental and Social Management Plan, and the Health, Safety and Security Plan, certain institutional mechanisms with well-defined roles and responsibilities are essential for effective implementation of identified mitigation and control measures both during the construction and operation phases.

## 2.1. SA Management

SA will have ultimate responsibility for implementing the provisions of the ESMP. This role will include the on-going management of environmental and social impacts, control of HSS risks, monitoring of contractor performance as well as development of mechanisms for dealing with environmental and social problems, and HSS concerns. SA will also ensure that the activities of its Engineering, Procurement and Construction (EPC) Contractor and other contractors (and subcontractors) are conducted in accordance with good practice measures, implementation of which will be required through contractual documentation.

### 2.1.1. OEM/EPC Contractor – To be Determined

SA has not yet appointed an OEM/EPC Contractor for the Project's detailed engineering, construction and operations phases. As such, this ESMP represents the minimum requirements for environmental, social, and health safety and security management. Conformance with the ESMP roles and responsibilities, policies, procedures and requirements for documentation is part of the OEM/EPC Contractor delivery guarantee to be provided with their response to the EPC Request for Proposal.

### 2.1.2. Roles and Responsibilities of Selected EPC EHS Department

SA will oversee the Project performance pertaining to environment, health, safety and social issues. The selected EPC Contractor will provide a dedicated HSE Department to support the Project. The EPC Contractor's HSE Department will have overall responsibility for the coordination of the actions required for environment and social management and mitigation, control of HSS risks, and for monitoring the progress of the proposed ESMP for the Project. However, ultimate responsibility for implementing the provisions of the ESMP will lie with SA.

In general, the EPC Contractor's EHS Department shall perform the following activities:

- Ensuring availability of resources and appropriate institutional arrangements for implementation of the ESMP.
- Preparation of required documents on environmental, social and health and safety management.
- Effective implementation of the health, safety and security management system.
- Confirming the competence of contractors/sub-contractors engaged on the Project and monitoring their performance in complying with the HSS management system.
- Collection of the statistics of health of workers.
- Collection and monitoring of data on personnel. Contractor, health and safety.
- Providing support during routine medical check-ups of workers.
- Awareness-raising and implementing safety programs.

- Providing job specific induction training.
- Compliance with regulatory requirements.
- Carrying out environmental, health and safety and security audits.
- Identify unsafe acts & conditions and suggest remedies.
- Develop safety culture and comply with the company's HSE policy and standards requirements.
- Encourage and enforce the use of PPE.
- Educate all employees in the use of PPE and safe practices.
- Direct, coordinate and orient the HSS activities.
- Promulgate the spread of policy, objectives, rules and/or regulations.
- Perform a thorough investigation of all accidents and review the recommendations to avoid any repetition.
- Monitoring the progress of implementation of the ESMP.
- Reviewing and updating the ESMP as and when required for its effective implementation.

# 3. ENVIRONMENTAL AND SOCIAL IMPACTS ASSESSMENT OUTCOMES AND REQUIREMENTS

The Environmental and Social Impact Assessment conducted for the Project identified all of the potential environmental and social impacts of this Project. Potential health, safety and security risks have been identified in the risk register prepared for the Project. The required mitigation measures for each of the potential adverse environmental and socio-economic impacts, and health and safety risks that may arise have been considered and are detailed herein.

Furthermore, a complete monitoring and auditing system has been suggested in order to sustain the social and environmental situation in the Project area. These measures should significantly reduce the identified potential environmental and social impacts. The effective implementation of the Health, Safety and Security (HSS) Management System will control the potential HSS risks associated with the Project.

## 3.1. Monitoring, Auditing and Reporting

A monitoring, auditing and reporting procedure has been established to ensure proper implementation of mitigation measures and maintain or improve the environmental and the socio-economic characteristics of the area during the construction and operation phases of the Project, and manage Health, Safety and Security risks. The monitoring procedure will focus on transport, birds, bats, noise, shadow flicker and visual impact, air quality, any emerging socio-economic adverse effects, and the effective implementation of the HSS management system.

The monitoring activity will monitor the application of environmental and social mitigation measures and the result of monitoring activities shall be reflected in monthly reports. Inspection and monitoring of the environmental, social and health and safety impacts of the Project activities will increase the effectiveness of the ESMP. Through the process of inspection and auditing, SA will ensure that the conditions stipulated in various permits are complied with.

## 3.2. Inspection and Audits

The inspection and audits will be undertaken for the Project by the identified EPC Contractor's HSE staff in coordination with Lebanon Wind Power and any other external agencies identified. The entire process of inspections and audits will be documented. The inspection and audit findings are to be implemented by the EPC Contractor in the respective areas, as appropriate. Lebanon Wind Power will develop and implement a program of reporting through all stages of the project cycle.

The EPC Contractor's delegated HSE Department personnel shall be required to fully comply with the reporting program in terms of both timely submissions of reports as per acceptable level of detail. Reporting will be done in the form of an environmental and health and safety check list, incident record register, environmental and social performance reports, health, safety and security reports (weekly, monthly, quarterly, half yearly, yearly etc.).

### 3.3. Documentation

Documentation is an important step in implementing the ESMP. SA will establish a documentation and record keeping system to ensure recording and updating of documents per the requirements specified in the ESMP. The documents should be kept as hardcopies as well as in electronic format.

Responsibilities have to be assigned to the EPC Contractor's delegated HSE Department personnel for ensuring that the ESMP documentation system is maintained and that document control is ensured through access by and distribution to, identified personnel in the form of the following:

- Master Environment/Health Safety and Security Management System documents.
- Risk Register/risk assessments.
- Operational control procedures.
- Work instructions.
- Records of inspection of safety critical equipment, for examples cranes/lifting equipment,
- Incident reports/investigations.
- Emergency preparedness and response procedures.
- Training records.
- Monitoring reports.
- Auditing reports.
- Grievance/Complaint/Enquiry Register and issues attended/closed.

Inspection and audit findings along with their improvement program are to be regularly reported to the senior management for their consideration. The same are also to be communicated within the staff working on the Project. To maintain an open communication between the staff and management on HSE and social issues the following are to be implemented:

- Team Briefings.
- On-site work group meetings.
- Work Specific Instructions.
- Meetings with stakeholders in collaboration with SA.

The EPC Contractor's HSE Department Supervisor is the responsible person for ensuring that communication with regulatory agencies and stakeholders are maintained as per the requirement. All complaints and enquiries are to be appropriately dealt with and records be maintained in a Complaint/Grievance/Enquiry Register by the delegated staff of HSE. All communications made to regulatory agencies should also be reported to SA's Corporate Manager.

The ESMP acts as an environment, social and health and safety management tool which needs to be reviewed periodically to address changes in the organization, process or regulatory requirements.

Following a review, the EPC Contractor's HSE Department Supervisor will be responsible for: 1) recommending amendments to the ESMP; and 2) seeking approval from the SA management. The amended ESMP will be communicated to all the staff.

### 3.4. Training

Training is needed for effective implementation of the ESMP. The EPC Contractor's HSE Officer will ensure that the environmental Health and Safety Induction Training and job-specific training are identified and appropriately provided to personnel for construction and operations activities. This will

include ensuring and checking the competence and training of contractors/subcontractors engaged on the Project. In addition, general environmental awareness and a positive health and safety culture will be increased among the Project team to encourage the implementation of environmentally sound practices, good health, safety and security practices and compliance requirements of the project activities. This will help in minimizing adverse environmental impacts, reduce health, safety and security risks, promote compliance with the applicable regulations and standards, and achieve performance beyond compliance.

# 4. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN ELEMENTS

## 4.1. Climate and Climate Change

### 4.1.1. Construction

- The GHG emissions are considered offset by the beneficial impact of generating clean energy through the operation of the wind farm.
- Since the EDL emission rate is 630 t CO2eq/GWh, the carbon payback period is 83 days.

### 4.1.2. Operations and Maintenance

#### 4.1.2.1. Flood Risk

- The selected OEM/EPC Contractor, as part of the detailed design prepared for the Project, avoid locating any of the Project components within the buffer distances developed under the flood risk assessment to eliminate any risks for flood.
- A detailed hydrological study must be undertaken to identify and determine the required engineering structures to be considered as part of the detailed design for new asphalt and gravel road segment and internal tracks (e.g. drainage structures, culverts).

#### 4.1.2.2. Wildfire

- The selected OEM/EPC Contractor, as part of the detailed design prepared for the Project, avoid locating any of the Project components within the buffer distances (if any) developed for the Karm Chbat Nature Reserve.
- The selected OEM/EPC Contractor must identify and determine the required fire detection and protection equipment to be considered as part of the detailed design.

## 4.2. Geology and Hydrology

### 4.2.1. Construction, Operations and Maintenance

#### 4.2.1.1. Impacts to Soil and Groundwater

While typically not a groundwater issue, control of these pollution sources in a karstic environment is necessary to preclude impacts to groundwater. Control impacts to soil and groundwater through:

- Implementation of general best practice housekeeping measures
- Following the Construction Health and Safety Plan.
- Staging of work areas.
- Provision of washout/washdown facilities with filter/neutralization prior to discharge.
- Installation of silt fencing.
- Erosion and sediment control.
- Excavation and grading containment.
- Provision of spill response equipment.

#### 4.2.1.2. Impacts from Improper Management of Waste Streams

***Solid Waste Generation***

- Coordinate with the appropriate Municipality or hire a competent private contractor for the collection of solid waste from the site to the municipal approved disposal area.
- Prohibit fly-dumping of any solid waste to the land.
- Distribute appropriate number of properly contained litter bins and containers properly marked as "Municipal Waste".
- During construction, distribute a sufficient number of properly contained containers clearly marked as "Construction Waste" for the dumping and disposal of construction waste. Where possible, the OEM/EPC Contractor must seek ways to reduce construction waste by reusing materials (for example through recycling of concrete for road base course).
- Implement proper housekeeping practices on the construction site at all times.
- Maintain records and manifests that indicate volume of waste generated onsite, collected by contractor, and disposed of at the landfill. The numbers within the records are to be consistent to ensure no illegal dumping at the site or other areas.

***Wastewater Generation***

- Coordinate with Akkar Water Directorate to hire a private contractor for the collection of wastewater from the site to the appropriate WWTP.
- Prohibit illegal disposal of wastewater to the land.
- Maintain records and manifests that indicate volume of wastewater generated onsite, collected by contractor, and disposed of at the WWTP. The numbers within the records are to be consistent to ensure no illegal discharge at the site or other areas.
- Ensure that constructed septic tanks during construction and those to be used during operation are well contained and impermeable to prevent leakage of wastewater into soil.
- Ensure that septic tanks are emptied and collected by wastewater contractor at appropriate intervals to avoid overflowing.

***Hazardous Waste Generation***

- Coordinate with the MOE and hire a private contractor for the collection of hazardous waste from the site to the X Hazardous Waste Treatment Facility.
- Follow the requirements for management and storage as per hazardous waste management and handling of the MOE.
- Prohibit illegal disposal of hazardous waste to the land.
- Ensure that containers are emptied and collected by the contractor at appropriate intervals to prevent overflowing.
- Maintain records and manifests that indicate volume of hazardous waste generated onsite, collected by contractor, and disposed of at the X Hazardous Waste Treatment Facility. The numbers within the records are to be consistent to ensure no illegal discharge at the site or other areas.

***Hazardous Materials***

- Ensure that hazardous materials are stored in proper areas and in a location where they cannot reach the land in case of accidental spillage. This includes storage facilities that are of hard impermeable surface, flame-proof, accessible to authorized personnel only, locked when not in use, and prevents incompatible materials from coming in contact with one another.

- Maintain a register of all hazardous materials used and accompanying Material Safety Data Sheet (MSDS) must present at all times. Spilled material should be tracked and accounted for.
- Incorporate dripping pans at machinery, equipment, and areas that are prone to contamination by leakage of hazardous materials (such as oil, fuel, etc.).
- Regular maintenance of all equipment and machinery used onsite. Maintenance activities and other activities that pose a risk for hazardous material spillage (such as refueling) must take place at a suitable location (hard surface) with appropriate measures for trapping spilled material.
- Ensure that a minimum of 1,000 liters of general-purpose spill absorbent is available at hazardous material storage facility. Appropriate absorbents include elite, clay, peat and other products manufactured for this purpose.
- If spillage on soil occurs, spill must be immediately contained, cleaned-up, and contaminated soil disposed as hazardous waste.

#### 4.2.1.3. Impacts on Water Resources

- The anticipated impacts on the local water resources and utilities are considered of short-term duration during the Project construction phase and of long-term duration during the operation phase. Such impacts are expected to be of low magnitude and of low sensitivity given the minimal water requirements of the Project.
- The selected OEM/EPC Contractor should coordinate with the Akkar Water Directorate to secure the water requirements of the Project.

***Impacts on Wastewater Disposal Utilities***

- The anticipated impacts on wastewater utilities are considered of short-term duration during the Project construction phase and of long-term duration during the operation phase. Such impacts are expected to be of low magnitude given the minimal wastewater quantities generated, and of low sensitivity as they will be easily handled.
- There are no mitigation measures to be applied. However, the selected OEM/EPC Contractor must coordinate with the Akkar Water Directorate to obtain list of authorized contractors for disposal of wastewater.

***Impacts on Solid Waste Disposal Utilities***

- The anticipated impacts on solid waste utilities are considered of short-term duration during the Project construction phase and of long-term duration during the operations and maintenance phase. Such impacts are expected to be of low magnitude given the minimal solid waste quantities generated, and of low sensitivity as they will be easily handled by the landfill.
- Given the above impact is considered not significant. As such, there are no mitigation measures to be applied. However, the selected OEM/EPC Contractor must:
  - Undertake discussions with the appropriate municipal landfills to determine where there is sufficient capacity to easily handle construction debris generated from the Project.
  - Coordinate with the appropriate municipality or hire a competent private contractor for the collection of construction waste from the site to the approved landfill.
  - Coordinate with the appropriate municipality or hire a competent private contractor for the collection of solid waste from the site to the approved landfill.

***Impacts on Hazardous Waste Disposal Utilities***

- The anticipated impacts on hazardous waste utilities are considered of short-term duration during the Project construction phase and of long-term duration during the operations and maintenance phase. Such impacts are expected to be of low magnitude given the minimal hazardous waste quantities generated, and of low sensitivity as they will be easily handled appropriately by an appropriate Hazardous Waste Treatment Facility.
- The impact is considered not significant. As such, there are no mitigation measures to be applied. However, the selected OEM/EPC Contractor must coordinate with the MOE to hire a competent private contractor for the collection of hazardous waste from the site and disposal at an appropriate Hazardous Waste Treatment Facility.

## 4.3. Geophysical Ground and Seismicity

### 4.3.1. Construction, Operations and Maintenance

#### 4.3.1.1. Landslide, Slope Stability, Earthquake

- Ground stability problems are not expected due to high resistance values and safe carrying power values evidenced by the seismic measurements.
- During detailed design, the OEM/EPC Contractor will incorporate the recommendations of the seismic study for excavation at the platform foundation locations to a depth where stable soils are encountered.

## 4.4. Air Quality

### 4.4.1. Construction and Decommissioning

#### 4.4.1.1. Impact of Particulate Matter

- Use of wind screens or enclosures around dusty activities or the site boundary. Mojave Desert Air Quality Management District assumes that complete coverage by wind screens (on the windward side) will provide a control efficiency of 75 percent.
- Water spray is also used to reduce fugitive dust as it increases the moisture content of the material. Therefore, and according to Mojave Desert too, Water spray (Application point) will ensure a control efficiency of 75%. This is very useful for exaction for example.
- For unpaved roads, water flushing is the essential with 0.48 gallons per square yard twice per day to maintain a control efficiency above 50%.
- For paved roads, water flushing with 0.48 gallons per square yard followed by sweeping is very effective and can reach 96%. If conducted directly before the passage of the turbines convoy or the morning and evening passages of the project vehicles to and from the site, a consequent decrease will occur.
- A combination of the different above-mentioned measures will give a higher control efficiency that when applied individually.

## 4.5. Transport and Traffic

### 4.5.1. Construction

#### 4.5.1.1. Obstacle Removal

- An additional route survey will be undertaken once the OEM/EPC Contractor is selected.
- The temporary removal of concrete bund, curb, electric pole and overhead cable, and demolition of the 45m of concrete wall be coordinated with the Port Authority.
- Raising of pedestrian bridges, prohibition of car parking, removal of curbs, electric poles, trees, lamp posts, and fencing at ramps and roundabouts and ground leveling and compaction of significant curves will be coordinated with the Ministry of Transport.
- Asphalt speed bumps will be replaced with rubber ones, which we can easily be removed during the transportation of the WTG components and reinstalled immediately after the trucks pass.
- Any modification required for the Al Abdeh roundabout will be discussed with the municipality as it is under their authority.
- Such works will be coordinated and permitted by the Project Proponent and the Ministry of Transport and scheduled for time periods when traffic levels and/or pedestrian use are lowest.

#### 4.5.1.2. New Road Development

- The construction of asphalt roads will occur for a period of 6 months and will be coordinated and permitted by Ministry of Transport and scheduled for time periods when traffic levels are lowest.
- Construction of internal track will occur for a period of 3 months and will be coordinated with the Ministry of Transport and the Lebanese Army.

#### 4.5.1.3. Transport of WTG Components, Construction Materials and Workers

- A communications protocol being developed for the transport of WTG components will be distributed to all Mayors two to three months prior to the start of transport. A final transport route map will be provided to all municipalities.
- All three wind farms will use the same traffic access plan.
- Announcements will be made to all villages along the WTG transport route from the Tripoli Port to the entrance of the Project site).
- WTG components will be transported 2 days per week, a total of 22 trucks roundtrip per week.
- Municipal police will provide an escort for the WTG transport convoy.
- Transport will be timed before and after farmers take their crops to the Akkar Vegetable Market.
- The road that passes through El Rweimeh Village is the main access of the trucks transporting rocks and gravel, and maintenance activities will be undertaken by the Project Proponent.
- For Road Segments A, B, C and D, which are 4 lanes with a median, a conservative approach to traffic management will dedicate the northbound direction for transport and divert all other background traffic to the other direction making a two-lane road.
- For Road Segment E, which is a two-lane road, the transport vehicles will have to utilize the road along with the background traffic.
- Once the EPC Contractor has been selected, and the number and location of construction numbers are known, measures will be put in place to maximize mitigation of traffic impacts through carpooling and group transport by van.

## 4.6. Biodiversity

### 4.6.1. Construction, Operations and Maintenance, Decommissioning

#### 4.6.1.1. Habitat Loss

Pre-Construction

- Completion of a pre-construction flora survey to identify habitats and key flora species as identified in the baseline section.
- Micrositing of infrastructure to avoid or reduce oak woodland and mixed woodland removal.
- Preparation of a final BAMP outlining the measures required to deliver no net loss for areas of natural habitat, such as oak woodland and mixed woodland. A framework BAMP will be provided with the ESIA

Construction

- Offsetting for the loss of natural habitats will be required to deliver no net loss of biodiversity in these areas. Full details of the measures to achieve no net loss will be provided in the final BAMP. Measures would include additional tree planting to produce new areas or improve degraded areas of oak-dominated woodland and mixed woodland. The translocation of tree species would also be considered.
- Preparation and provision of workforce toolbox talks and monitoring to ensure all staff understand the importance of the biodiversity controls in place, what they entail and how these controls should be followed. Particular key early tasks in workforce education will include implementation of a hunting ban on the Project site and prohibition of burning of vegetation for warmth or cooking.
- Minimization of the project footprint within Karm Chbat Nature Reserve. Footprint minimization will include measures such as adherence to strict working boundaries for all infrastructure construction.
- If any key flora species are identified during the pre-construction survey, areas of habitat inhabited by the plants should be avoided. If it is not possible to avoid examples or areas of the species detailed in the baseline, every effort should be made to reduce the impact and further offsetting would be required.
- Implementation of rehabilitation measures to mitigate the loss of habitat, such as vegetation remediation, translocation or creation of new habitat areas.
- Proper management of excavation materials. Rubble from site excavations should not be allowed to spread down slopes. Clear working procedures should be defined, implemented and supervised.
- Separation and storage of top soil for use in restoration of all temporary project infrastructure and areas of temporary disturbance, e.g. track margins. Segregation of the topsoil of different habitat types will be required.
- Soil management would also include observance of appropriate biosecurity controls to prevent the spread of invasive plants or floral diseases. This would involve washing vehicles and equipment to remove particles of vegetation and loose soil, with this done in specific "wash down" areas. Any invasive plants that are removed during vegetation clearance would need to be disposed of appropriately, in a safe way that does not allow it to spread.
- Good construction environmental management on site based on best practice guidance to avoid spillage of fuels, other pollutants or excavated materials and provision of sufficient spill kits and similar to deal with any incidents.

During Operations and Maintenance

- Monitoring of all habitat reinstatement, translocation, recreation, offsetting or enhancement as identified and implemented as required following pre-construction surveys.
- Remove invasive plant species during routine vegetation maintenance.
- Monitor power-line right-of-way vegetation to avoid fire risk. Remove blowdown and other high-hazard fuel accumulations.

During Decommissioning

- Typically, the same controls set out for construction will apply.
- Minimization of activities within Karm Chbat Nature Reserve. Footprint minimization will include measures such as adherence to strict working boundaries for all infrastructure decommissioning.
- Good construction environmental management on site based on best practice guidance to avoid spillage of fuels, other pollutants or excavated materials and provision of sufficient spill kits and similar to deal with any incidents.
- Preparation and provision of workforce toolbox talks to ensure all staff understand the importance of the biodiversity controls in place and exactly what they entail.

#### 4.6.1.2. Terrestrial Fauna

***Loss or Disturbance of Resting Places***

During Pre-Construction

- Completion of pre-construction fauna walkover survey to identify potential habitat for key mammal and reptile species, followed by camera trapping to confirm species considered to be present/status of any dens found.
- Preparation of a final BAMP setting out the measures required based upon the findings of the further surveys. A framework BAMP will be included with the ESIA.

During Construction

- If any mammal or reptile species are encountered during works, they would be allowed to disperse or would be translocated outwith the construction area.

During Operation and Maintenance

- If found to be present during pre-construction surveys, monitoring of populations of endangered reptiles as appropriate, including monitoring of any offsets or enhancements for those species.

***Bats***

Assuming a likely worst-case scenario that the roost present is of national importance, the impact would be near certain to result in a significant ecological effect. Impacts associated with disturbance of a roost rather than loss of the roost would be similar but likely to be of moderate or low magnitude depending on the type of impact. A disturbance impact would occur as a result of construction noise, construction light or habitat alteration in the vicinity of the roost and could result in an ecologically significant effect.

During Pre-Construction

- A full year of activity surveys will be competed pre-construction, adding to the information gathered from the spring activity surveys used to inform this assessment. As per best guidance, a full year of survey data will allow for a more accurate understanding of bat activity across the site, temporally and spatially, which will enable a more accurate and informed impact assessment which in turn will determine the most effective mitigation required.

During Construction

- A presumption for avoidance of all artificial light as far as possible. All lights should be cowled and downward facing and avoid light spill onto surrounding non-construction areas.

Operation and Maintenance

- Assuming a worst-case scenario that the population(s) of bats using the foraging habitat is (are) of national importance, the impact would result in a significant ecological effect. Impacts associated with temporary loss of a foraging area, e.g. temporary construction infrastructure upon areas of sparse herbaceous vegetation, rather than the permanent loss of the foraging area would be similar but likely to be of moderate or low magnitude. It is considered possible that it could result in an ecologically significant effect.
- Once the pre-construction survey results have been analyzed, it will be possible to develop an appropriately focused scope of operational period bat surveys. Surveys would cover up to three years' activity periods.
- Given the high levels of activity recorded at SA2, SA6, SA9 and SA20 and predominately from species identified as high or medium risk in terms of collision (common pipistrelle, Kuhl's pipistrelle and serotine) it is recommended that turbines situated at these locations are subject to operational adjustments. Raising the cut-in speed at which the turbine begins to generate electricity, thus preventing movement in low winds, notably decreases bat mortality rates[26] along with feathering of blades i.e. adjusting the angle of the blade parallel to the wind or turning the unit away from the wind[27]. In addition, operational times could be altered – stopping turbines at these locations between the most active periods i.e. 20:00-05:00.
- Monitoring of bat collision fatalities under and around each turbine following a standardized methodology potentially using trained dogs. Monitoring to be completed monthly and concurrently with bird collision monitoring.
- Preparation and subsequent implementation of plan to identify and protect key bat roost caves in the area on and around the Project site from human persecution, such as identified elsewhere in the area.

#### 4.6.1.3. Ornithology

***Construction, Decommissioning***

Designated Sites

- The IBA lists soaring birds and cranes (namely white stork, white pelican, Levant sparrowhawk and common crane) as another key feature. Those species have not been recorded on the Project site during field surveys, they pass through the area on migration. As such, potential construction impacts would be limited to disturbance such as noise and light, from construction activities.

- Repetition of the migratory period VPs ensuring that the 36 hours per season standard is met. To be completed for three years after the start of operation and commence at the first migratory period after start of operation, regardless of whether it is the spring or autumn period.
- Monitoring of bird collision fatalities under and around each turbine following a standardized methodology potentially using trained dogs. Monitoring to be completed monthly between November and February and in June and July, i.e. outside of the migration periods. Completed weekly during spring migration period of March to May and August to October. Project specific monitoring protocol to be prepared based on best practice guidance.
- This study has not identified a need to shut down turbines on site during the bird migration seasons. However, if it were identified to be necessary based on the results of collision fatality monitoring or as a requirement of the as yet unpublished Lebanese Ministry of the Environment guidance on wind turbine shut down to avoid bird collisions, some or all turbines will be shut down as appropriate and proportionate to identified confirmed or potential impacts.
- Related to the previous action, the project will consider the installation of bird monitoring radar to inform all shutdown related activities.
- Strict enforcement of hunting ban on Project site.
- Avoid artificial light where possible. White steady lights attract prey and their predators. Use red or white blinking or pulsing lights instead.
- Enclosed, segregated waste disposal to avoid attracting birds to predictable food sources.

Habitat Loss

- Both temporary and permanent habitat loss are predicted as a result of the construction of the proposed development. Permanent loss would occur in the footprint of the infrastructure of the proposed development and from the construction of new permanent access tracks. Temporary, short-term habitat loss would occur at turbine bases, outside of the permanent hard-standing and from the construction of new temporary access tracks that would be reinstated after construction.
- Mitigation for habitat loss is as presented above for Biodiversity.

Nest Destruction

Where required, vegetation would be removed outside of the bird breeding season (March-August). The following vegetation removal deterrence methods would also be used to ensure ground nesting birds do not nest on the site following vegetation clearance:

- Iridescent tape across the construction areas prior to construction activities;
- Bird deterring machines which produce intermittent loud noises; and
- Walking of the cleared area by individuals on a regular basis to prevent birds settling and to monitor if any birds are settling to nests on areas close to the planned construction activity.

Where vegetation has not been removed outside of the breeding bird season and must be removed during the breeding bird season, then pre-clearance surveys must be undertaken by a suitably experienced ornithologist. These surveys would identify any potential nests in the vegetation to be removed and then establish suitable "no go" buffers around these nests, to prevent the nest being destroyed or disturbed. Buffers would be species specific and determined by the ECOW.

In addition to the above, prior to commencement of decommissioning activities, walkover surveys would be completed in habitats suitable for and known to be used by breeding bird species as to identify any previously unknown nest sites.

Disturbance and Displacement

Construction

- Disturbance of small breeding birds found on site as a result of construction activities would be an adverse, low magnitude, short-term impact on a community of birds considered to have local importance.

Operations and Maintenance:

- Both species could be displaced from the immediate zone during the operation of the proposed development.
- Disturbance from the presence of construction workers and vehicles and from visual and noise disturbance from the turbines could cause both species to forage away from the site.
- This would result in an adverse, low magnitude, long-term, impact on both species.

A Biodiversity Action and Management Plan (BAMP) Framework to address the above-mentioned impacts and mitigation measures is included in this ESMP (see **Appendix A**).

Collision Risk to Birds Flying at Height

- The results of the CRA suggest that significant collision risk impacts are not predicted. However, it is acknowledged that the CRA is based on assumptions and incomplete datasets and a significant collision risk impact for species could still occur. The bird migration route through the north-east of Lebanon is an internationally important route for many species and so it is recommended that additional safeguards are implemented to prevent significant collision risk events.
- This mitigation would rely heavily on the further monitoring work proposed, including continuing the migration season VP surveys, undertaking carcass searches beneath the constructed turbines and the installation of a bird detecting radar system.
- It is thus proposed that mitigation would involve the shutdown of the turbines during periods of peak collision risk potential, such as periods of peak bird migration movement or poor weather. Shutdown would be achieved by adjusting the blade angle to be perpendicular to the wind and applying the brake to prevent any blade rotation. Further information on this process, and potential compensation, will be provided in the Bird Monitoring Protocol being produced by the Lebanese Ministry of Environment

Barrier Effects

- The proposed development may result in a barrier effect on the movement of bird species with the vertical configuration of turbines creating an actual or perceived barrier which bird species may not cross or would need to habituate to crossing.
- Such adverse impacts would be of low magnitude to the species inhabiting the immediate zone but potentially of moderate magnitude to any species that might use the area around the Project site for migration.

#### 4.6.1.4. Socioeconomic Conditions

**Pre-Construction**

Advance notification of transport schedule and health, safety and security measures (refer to **Section 16 Community Health, Safety and Security**).

Additional measures to communicate the Project information to vulnerable groups including women, the elderly and informal settlements, including the provision of schedules, health, safety and security measures.

Establishment of the CRO Office in Jabal-Akroum Kfartoun.

Community development projects as agreed between Municipalities and the Developer.

Pre-recruitment skills training will be provided.

A job skills assessment will be undertaken to provide transparency in hiring practices.

***Construction***

Impacts to Landowner Communities

- Landowners have agreed that the compensation provided is appropriate and fair, though the Project represents a loss of access to 747,589m$^2$ which will be leased for the Project for 28 years, and +3,500m$^2$ will be acquired permanently.

Access to Grazing Areas

- A temporary loss of access of land for grazing of 45% of the total available in the Project area. Given the loss of access to nearly half of the total, the impact severity is anticipated to be high. Additional consultation will be undertaken with livestock owners and shepherds to explain the areas they cannot access for the duration of the construction. Alternative areas for grazing will be researched and secured by the Developer for alternative use during construction. If the Developer cannot arrange an alternative area because of landowners' objection, financial compensation will take place. All grazing areas will again be accessible at the end of construction. Shepherds grazing near the Project will be advised of exclusion zones in advance.

Access to Tracks by Recreational Hunters

- Recreational hunters near the Project will be advised of exclusion zones in advance, noting that other tracks are available, and hunting is for recreational purposes, i.e. not subsistence. Strict enforcement of a hunting ban is to be put in place.

***Operations and Maintenance***

- The Developer and Bank Audi will offer financial management training/classes to encourage appropriate savings and expenditure practices within the communities.

#### 4.6.1.5. Community Health, Safety and Security

Noise

***Construction, Decommissioning***

- Limit the working hours from Monday to Friday 7 a.m. to 7 p.m., if possible. Some flexibility in working hours may be required during the delivery and erection of turbines and depending on weather conditions.
- The final time schedule of the transport movements should be clarified with the authorities and communities. Only well-maintained equipment should be operated on-site.

***Operations and Maintenance***

- The distance of the WTGs to nearby receptors was increased by eliminating the originally planned WTGs 26, 27 and 28. In addition, WTG 25 was shifted to increase the distance to nearby receptors.
- In order to comply with the IFC noise limit of 45 dB(A) some turbines need to be operated in noise reduced modes. Using the noise reduced modes which are available for all considered turbine types, the IFC noise limit of 45 dB(A) can be complied with. Due to the fact, that the calculation was based on a worst-case assumption of 23 turbine locations, the noise assessment should be redone when the final and reduced turbine layout is available. At the time the final number of turbines is available, the noise reduction modes for the corresponding turbine type can be stipulated.
- The WTGs will be maintained regularly to ensure that the turbines do not become louder over time.

Shadow Flicker

***Operations and Maintenance***

- The installation of shadow flicker shutdown modules in the turbines is a very common and an often-applied mitigation measure. Shutdown modules will eliminate the possibility for exceedances of annual and day limits. An automatic shadow-flicker shutdown system shuts down the WTG when the sun is shining (direct sunshine on a horizontal area > 120 W/m²). These systems shut down a turbine when one of two conditions are reached:
  - More than 30 minutes of shadow-flicker occur on one day at a receptor.
  - The maximum annual quota of shadow-flicker at a receptor is exceeded.
- When shutdown systems feature a radiation sensor, the turbines only shut down when the sun is shining. If the shadow-flicker shutdown system does not include a radiation detector, the WTG will shut down at all times when the shadow-flicker assessment indicates shadow-flicker at a receptor (i.e. also in cases of overcast sky or fog when there is actually no shadow flicker).
- The use of shadow flicker shutdown modules will have a (small) negative effect on the energy yield of the wind farm.

Transport and Traffic

***Construction***

*Obstacle Removal*

- The temporary removal of concrete bund, curb, electric pole and overhead cable, and demolition of the 45m of concrete wall be coordinated with the Port Authority.

- Raising of pedestrian bridges, prohibition of car parking, removal of curbs, electric poles, trees, lamp posts, and fencing at ramps and roundabouts and ground leveling and compaction of significant curves will be coordinated with the Ministry of Transport.
- Asphalt speed bumps will be replaced with rubber ones, which we can easily be removed during the transportation of the WTG components and reinstalled immediately after the trucks pass.
- Any modification required for the Al Abdeh roundabout will be discussed with the municipality as it is under their authority.
- Such works will be coordinated and permitted by the Developer and the Ministry of Transport and scheduled for time periods when traffic levels and/or pedestrian use are lowest.

*Construction of New Road Segments*

- The construction of asphalt and gravel roads will occur for a period of 6 months and will be coordinated and permitted by Ministry of Transport and scheduled for time periods when traffic levels are lowest. The construction would be performed under the supervision and conditions of the relevant municipality.
- The improved road network will have a positive impact on the health and safety in the area by providing safer roads, minimizing impacts to city centers, providing greater buffer distances between houses and the road and eliminating dangerous curves/turns.

*Construction of Internal Track*

- Construction of internal track will occur for a period of 3 months and will be coordinated with the Ministry of Transport and the Lebanese Army.
- Occupational health and safety rules, codes and regulations will be followed during works.
- The OEM/EPC Contractor will be supervised by and accountable to the Developer.

*Transport of WTG Components*

*Impacts to Communities Along the Transport Corridor*

- The transport of WTG components will occur between 11pm and 4am to avoid impacts to communities traveling to work and school.
- Municipal police will provide end-to-end escort for the transport convoy.
- Advance notification of the scheduled transport will be provided to all communities along the route.
- The trucks will travel at a low speed to lessen the generation of noise, vibration and dust.
- A communications protocol being developed for the transport of WTG components will be distributed to all Mayors two to three months prior to the start of transport. A final transport route map will be provided to all municipalities.
- Transport will be timed before and after farmers take their crops to the Akkar Vegetable Market.
- For Road Segments A, B, C and D, which are 4 lanes with a median, a conservative approach to traffic management will dedicate the northbound direction for transport and divert all other background traffic to the other direction making a two-lane road.
- For Road Segment E, which is a two-lane road, the transport vehicles will have to utilize the road along with the background traffic.

*Impacts to Informal Settlements Along the Transport Corridor*

- The transport of WTG components will occur between 11pm and 4am to avoid impacts to communities traveling to work and school.
- Municipal police will provide end-to-end escort for the transport convoy.

- Advance notification of the scheduled transport will be provided to all communities along the route.
- The trucks will travel at a low speed to lessen the generation of noise, vibration and dust.
- A communications protocol being developed for the transport of WTG components will be distributed to all Mayors two to three months prior to the start of transport. A final transport route map will be provided to all municipalities.
- Transport will be timed before and after farmers take their crops to the Akkar Vegetable Market.
- For Road Segments A, B, C and D, which are 4 lanes with a median, a conservative approach to traffic management will dedicate the northbound direction for transport and divert all other background traffic to the other direction making a two-lane road.
- For Road Segment E, which is a two-lane road, the transport vehicles will have to utilize the road along with the background traffic.

*Transport of Construction Materials*

- The OEM/EPC Contractor will meet with Rweimeh Village residents of the houses located along the quarry tracks and existing asphalt roads to discuss the Project and nature and timing of the transport of construction materials.
- Advance notification of the start of construction will be provided.
- The trucks will travel at a low speed to lessen the generation of noise, vibration and dust.
- Occupational health and safety rules, codes and regulations will be followed during works.
- Negotiation of entry to quarry roads by resident vehicles will follow standard traffic safety/traffic control protocols, i.e. Stop/Go signage, flagman, etc.
- The OEM/EPC Contractor will be supervised by and accountable to the Developer.

A Construction Phase Health, Safety and Security Framework to address the above-mentioned impacts and mitigation measures is included in this ESMP (see **Appendix B**).

#### 4.6.1.6. Landscape and Visual Impact

***Operations***

*Change on Views and Landscape*

- Large, multi-MW turbines with large rotor diameters are considered. By using large, multi-MW turbines with large rotor diameters the number of turbines per generation capacity and the footprint of the Project will be reduced. In addition, large rotors have a reduced rotor speed compared to smaller turbines which will also reduce the visual impact of the Project.
- The turbines SA 26, SA 27 and SA 28 were eliminated to reduce visual impacts to the receptors in the village El Rweimeh. The turbine SA 01 in the very north of the site was also erased. In altering the wind farm array this way, the distance to potential visual receptors was increased. In addition, the distance of the turbines to the wind energy projects Lebanon Wind Power and Hawa Akkar was also increased so that cumulative impacts could be reduced.
- The wind farm layout was designed so that the array follows the existing landform of the mountain ridges. By considering the landform of the mountain ridges at the wind fam design, the wind farm layout follows the existing morphology of the mountain. Consequently, the typological appearance of the ridge remains largely recognizable. In addition, the overlapping of rotors of views from the east and the west are unlikely which can be perceived as visually restless.

- Tracks will be designed to follow the existing tracks and fit with contours as far as possible. By following the existing tracks and fitting the location of the tracks with the contours lines the landscape impact of the tracks can be reduced.
- The turbines and all the other aboveground structures will be removed at the end of the operational lifetime. By removing the turbines and all the other aboveground structures at the end of the operational lifetime, the landscape impact of the project will be entirely revisable and limited to the operation phase of the project.
- The internal cabling should be underground cabling. By designing the internal cabling as underground cabling the landscape impact in the immediate surrounding was reduced.

#### 4.6.1.7. Archaeology and Cultural Heritage

***Construction, Decommissioning***

Buried Artifacts

Though the potential for impact is considered low, a Chance Finds Procedure has been developed (in accordance with guidance provided by the Ministry of Culture and the General Directorate of Antiquities) to appropriately respond to cultural resources encountered during construction, as follows:

Where historical remains, antiquity or any other object of cultural or archaeological importance are unexpectedly discovered during construction in an area not previously known for its archaeological interest, the following procedures should be applied:

1. Stop construction activities.
2. Delineate the discovered site area.
3. Secure the site to prevent any damage or loss of removable objects. In case of removable antiquities or sensitive remains, a night guard should be present until the Responsible Authorities takes over.
4. Notify the responsible foreman/archaeologist, who in turn shall notify the Responsible Authorities, the General Directorate of Antiquities and local authorities (within less than 24 hours).
5. The Responsible Authorities will be in control of protecting and preserving the site before deciding on the proper procedures to be carried out.
6. An evaluation of the finding will be performed by the General Directorate of Antiquities. The significance and importance of the findings will be assessed according to various criteria relevant to cultural heritage including aesthetic, historic, scientific or research, social and economic values.
7. The decision on how to handle the finding will be reached based on the above assessment and could include changes in the Project layout (in case of finding an irrevocable remain of cultural or archaeological importance), conservation, preservation, restoration or salvage.
8. The Responsible Authorities' decision concerning the management of the finding shall be implemented fully.
9. Construction work could resume only when permission is given from the Responsible Authorities after the decision concerning the safeguard of the heritage is fully executed.
10. The Chance Finds Procedure has been included in this stand-alone ESMP.

Eco-Tourism at Karm Chbat Nature Reserve

- During the construction phase, access to certain portions of the 5.13Mm$^2$ Karm Chbat Nature Reserve will be limited to ensure the health and safety of visitors.

#### 4.6.1.8. Occupational Health & Safety

***Impacts to Workers***

*Construction, Decommissioning*

*Air Quality*

- Covering loads of dusty or excavated materials on a vehicle entering or leaving the construction site with impervious sheeting (such as nylon canvas).
- Undertaking proper enclosure and guarding to limit public access to the site.
- Drivers and workers in the vicinity of earth moving equipment would be supplied with ear mufflers, as well as goggles and nose masks, if necessary, in order to protect them from dust impacts.
- Water spraying at the excavation sites prior to, during and after excavation to limit airborne particles.
- Proper unloading of materials on-site to minimize dust.
- Limiting the use of heavy equipment during periods of high winds.
- Forbidding construction vehicles from keeping engines running (waiting to enter site or on-site).
- Adopting weight limits for trucks and not exceeding vehicle loading capacity.
- Ensuring adequate maintenance and repair of construction machinery.
- Maintaining good housekeeping practices; and effective operational and waste management practices.
- Implementing H&S measures (masks, work gloves, proper clothing, H&S rules) as needed.
- Providing suitable rehabilitation and maintenance of road network surfaces to ease traffic flow.
- Using environmentally friendly equipment with higher fuel efficiency or air pollution control.
- Maintaining and operating equipment using appropriate fuel mixtures.
- Enforcing speed limits for vehicles and maintaining normal traffic speed on-site and recommended traffic speed and driving time on the roads.
- Applying dust suppression methods such as watering at access and internal roads.
- Adopting good house-keeping measures to reduce dust build-up.
- Maintaining stockpiles at minimum heights and forming long-term stockpiles into the optimum shape (i.e. stabilization) to reduce wind erosion.
- Avoiding open burning of solid waste.
- Enclosing the construction site with a dust mesh, as applicable.
- Carrying out loading and unloading of material without scattering.
- Covering access roads and internal roads with plant mix.
- Washing construction vehicles leaving site to prevent transmission of soil.
- Keeping drop height of materials that have potential to generate dust at a minimum.
- Using well-maintained vehicles and ensuring regular maintenance of these vehicles.
- Collecting and addressing complaints and suggestions through grievance mechanism.

*Water and Soil Resources Protection*

- Awareness on the efficient use of water.
- Minimizing water and soil exposure.
- Minimizing and if possible, eliminating chemical usage (oil, lubricants and fuel) onsite.
- Using as much as possible non-toxic and biodegradable chemicals to be stored on-site.
- Reporting in case of spills from generator or disposed waste on-site in order to seek immediate remedial measures.

- Routine inspection and maintenance of equipment to ensure that risk of leak/spill is minimized.
- Promotion of good housekeeping during operation and maintenance.
- Control and supervision of refueling at all times by appropriate personnel.
- Development and implementation of training program for management of hazardous substances.
- Temporarily store hazardous waste on-site in a designated and enclosed area.
- Forbidding hazardous waste storage outside designated area.
- Ensuring that oil changes, refueling, or lubrication of vehicles will be conducted offsite or in a dedicated area.
- Equipping fuel storage tanks with drip trays and spill control equipment.
- In case of spills, hazardous materials would be controlled via absorbents, and contaminated soil would be removed and disposed of in compliance with applicable legislation.

*Topsoil Management*

- Strip topsoil from project footprint (turbine bases and platform) at suitable depths and store separately at specialized areas.
- Minimize topsoil losses via use of suitable equipment, procedures and construction work schedule - avoid soil disturbance during heavy windy and rainy periods.
- Identify topsoil storage areas at relatively low slope areas.
- Ensure that top soil stockpiles do not exceed 2m in height.
- Ensure that only soil material will be stored at topsoil storage areas.
- Maintain slope stability and a safe working environment for heavy construction vehicles.
- Ensure that surface grading is done with appropriate vehicles to avoid soil compaction.
- Enclose topsoil storage area(s) with fencing and place explanatory signboards
- Ensure drainage of temporary topsoil site(s).
- Within completed construction areas (turbine bases and platforms), reuse stored top soil for rehabilitation and landscaping.
- Do not use vegetative soil or topsoil as fill material under any circumstances.
- Ensure unnecessary soil stripping to minimize disturbance to vegetation, ecosystems and soils.

*Noise and Vibration*

- Choosing equipment with lower sound power levels when possible.
- Using noise mufflers, and minimizing machinery or equipment idling conditions.
- Optimizing internal-traffic routing to minimize vehicle reversing needs and maximize distances from closest sensitive receptors.
- Keeping the main access road in well-maintained condition.
- Ensuring mobile vehicles use only designated roads to reduce traffic through community areas
- Proper site logistics and planning.
- Performing proper maintenance on construction vehicles and equipment.
- Limiting site working hours if possible.
- Conducting construction activities closest to noise sensitive receptors during day time only.
- Informing local municipalities and residents of the construction schedule and time of planned noisy activities.
- Informing noise sensitive receptors about construction schedule in their proximity in advance.
- Scheduling potentially noisier activities during daytime and/or less intrusive times.
- Conducting noise monitoring during construction to verify compliance with regulatory limits.
- Keeping equipment speed as low as feasibly possible without compromising performance.

- Collecting and addressing complaints and suggestions through grievance mechanism.
- *Solid Waste Management*
- Proper site clearing.
- General cleanliness and organization of the site.
- Use of excavated material as fill material, e.g. topsoil.
- Segregation and proper disposal waste oils, paint barrels, lubricants, etc. from other wastes.

*Traffic and Transport*

- Planning, development and implementation of traffic management
- Maintaining minimal traffic speed on-site and recommended traffic speed and driving time off-site
- Implementing working hour limits for drivers and inform drivers periodically on working schedule
- Implementing restrictions for night time driving
- Adopting proper weight guidelines for trucks and not exceeding vehicle loading capacity
- Providing alternate routing plans during all phases of construction
- Restricting operation of heavy vehicles to those who are trained, competent and licensed
- Providing traffic trainings to all relevant personnel and specialized trainings to personnel who will operate industrial, heavier or critical vehicles.
- Including traffic issues in the scope of the trainings and instructions for site visitors.
- Limiting visitor mobility in the construction area.
- Installing and maintaining signage and other traffic visuals.
- Implementing right of way practices.
- Implementing proper vehicle maintenance at all times.
- Conducting or enforcing periodic medical examinations for drivers.
- Conducting awareness raising activities for affected communities through established mechanism.
- Collecting and addressing complaints and suggestions through the grievance mechanism.

*Health and Safety*

- Restriction of access to project construction areas by patrolling and guarding.
- Provision of training on the fundamentals of occupational Health and Safety procedures.
- Developing an Emergency Response Plan and training personnel on the actions to be taken in risk situations.
- Installation of warning signs at the entrance to the site to inform people about the Project and risks associated with entry.
- Availability of personal protective equipment (PPE) such as protective clothing, goggles, gloves, boots, masks, rubber boots, brightly colored working overalls equipped with light reflecting stripes, safety helmets, rubber or plastic type of equipment (broom, shovel, other) for personnel as needed.
- Covering excavated ground (e.g. anchorage pits for turbines before filling) to prevent fall-in accidents for people and animals alike.
- Provision of on-site medical facility/first aid and medical insurance for the workers/construction site.
- Installing retaining nets to hold falling debris during site clearing and construction.
- Prevention of stagnation of exposed water volumes to hamper insect and vector breeding.
- Implementation of speed limits for trucks entering and exiting the site.
- Installing proper signage to avoid accidental injury.
- Implementing good housekeeping practices.

- Ensuring that the project elements (turbines, bases, offices, substation, etc.) are designed incompliance with applicable legislations related to natural hazards, especially seismic safety
- Conducting regular maintenance of equipment.

*Operations*

*Air Quality*

For generators and other equipment:

- Using good quality fuel (from reputable sources).
- Performing regular and preventive routine maintenance according to manufacturer recommendations.
- Looking out for and fixing potential leakage and spillage of any kind at an early stage.
- Outfitting of the generators with an effluent filter for Particulate Matter (PM).

*Water and Soil Management*

- Collecting domestic wastewater from toilets and sinks and conveying to public sewer network.
- Ensuring that no sanitary wastewater is discharged onto the land.
- Identify high risk spill areas, e.g. fuel tanks and generator – and have impervious surfaces and capture facilities in place.
- Limit activities during adverse weather conditions to reduce potential wind and water erosion.

*Noise and Vibration*

- Adopting proper scheduling for noisy wind turbine / sub-station maintenance activities.
- Selecting adequate noise muffling equipment and minimizing machinery idling.
- Ensuring good maintenance and repair of equipment.
- Optimizing turbine operation as per wind speed to minimize noise generation.
- Keeping turbines in good working order throughout the operational life of the project via routine maintenance, inspection and operational diagnostics.
- Limiting the cutting/clearing of vegetation.
- Planting trees near sensitive receptors to act as a noise barrier.
- Ensuring equipment that may be intermittent in use is shut down between work periods or throttled down to a minimum.
- Implementing a rigorous inspection and maintenance program applicable to equipment on-site.
- Providing adequate Personnel Protective Equipment (PPE) to workers at noisy activities/locations that exceed permissible occupational noise level limits.
- Conducting noise monitoring (1st year of operation, continuous at local municipalities, and in case of complaints) to verify compliance with regulatory limits and take corrective action.

*Solid Waste Management*

- Storage of SW in a pre-determined area in covered drums for collection and disposal.
- Keeping the site free of litter.

*Health and Safety*

- Restricting access to project elements (turbines, substation) by patrolling and guarding areas around the site – noting that local residents, shepherds/herders, herb gatherers, and land users,

will not be subject to area access restrictions, but rather restrictions related to accessing Project elements.

- Installation of warning signs at site entrances to warn people about the Project and associated risks.
- Provision of appropriate monitoring instruments
- Conducting regular maintenance of equipment.
- Enforcing on-site transportation regulations.
- Covering excavated ground (e.g. anchorage pits for turbines before filling) to prevent fall-in accidents for people and animals alike.
- Prevention of stagnation of exposed water volumes to hamper insects and vector breeding.
- If needed, employees should be provided with PPE such as hand gloves, helmets, safety shoes, goggles, aprons etc. and ear protecting devices like earplugs/earmuffs and breathing masks.
- Prohibition of dirt accumulation, dampness, water, oil, and other substances which may adversely affect electrical safety within electrical areas or the sub-station.
- Training of workers and staff for fire-fighting, work permit system, first aid, safe handling of chemicals and integrating safety during operation.
- Provision of safety and warning signs where needed (displayed in Arabic and English).
- An accident / incident reporting and information system for employees for good awareness levels.
- Provision of first aid boxes at key points at the project facilities with prominent marking.
- Regulations prohibiting smoking in potentially fire prone or sensitive areas and all indoor areas.
- Provision of fire-fighting equipment and/or system if/where needed within site facilities; and regular testing of fire extinguishers.
- Ensuring electrical switchboards are not accessible to the public and related cautionary signs are in place.
- Ensuring access to turbine ladders is closed off and related cautionary signs are in place.
- Grounding installed conducting objects, as applicable.
- Ensuring maintenance schedule for turbines is strictly followed.
- Specific to hazards due to accidents and/or incidents and lifting objects to heights can be applicable during construction and operation:
- Ensuring use of applicable PPEs and other protective means.
- Installing guard rails and signs.
- Ensuring sufficient overall illumination during working hours and special illumination on hazard areas during nighttime.
- Conducting regular visual checks and clean-up of excavation debris.
- Restricting operation of heavy machinery to those who are trained, competent and licensed
- Providing regular H&S trainings.
- Conducting labor audits to contractors' work force by an external third party.
- Limiting manual lifting/handling needs by providing mechanical alternatives.
- Ensuring personnel who conduct lifting operations receive special training.
- Ensuring lifting operations are well planned and risks discussed in advance.
- Ensuring lifting equipment is properly maintained and has sufficient capacity to support the weight.
- Setting exclusion zones below any activities working at height, to account for falling objects.
- Abiding by weather condition limits set by the lifting equipment manufacturer.
- Implementing the worker internal occupational grievance mechanism.
- Conducting regular labor audits to contractors' workforce (by independent third-party auditors).

- Mitigation measures specific to blade and ice throw, and lightning applicable during operation:
- Installing, maintaining and updating lightning protection systems for turbines and other elements.
- Installing and maintaining vibration sensors that react to imbalance in rotor blades and shut down turbines.
- Using de-icing mechanism, especially during fall and winter seasons.
- Carrying out periodic blade inspections and repairing defects that could affect blade integrity.
- Ensure heat control mechanism is maintained properly.
- Ensure static and illuminated warning signs are used to inform/warn receptors.

Policies and procedures have been included in this ESMP to address impacts to workers and mitigation measures (see **Appendices C, D, E, F** and **G**).

### 4.7. Summary Matrix

A summary matrix for the implementation of the proposed mitigation measures and the parties who are responsible for their implementation is provided in **Table 1**.

Framework plans and policies appended to this ESMP are as follows:

**Appendix A -** Biodiversity Action and Management Plan Framework

**Appendix B** – Construction Phase Health, Safety and Security Framework

**Appendix C –** Human Resources Policy

**Appendix D –** Recruitment and Selection Policy

**Appendix E** - Workers' Grievance Mechanism

**Appendix F** - Workers Grievance Log

**Appendix G –** Corporate Social Responsibility (CSR) Program- Discussion Paper

**Table ESMP - 1 Mitigation And Responsibilities**

| Project Activities | Impact/Issue | Project Phase | Mitigation Measures | Responsibility for Implementation of the Suggested Mitigation | Means of Verification | Frequency of Monitoring | Responsibility for Monitoring | Reporting Requirements |
|---|---|---|---|---|---|---|---|---|
| • Construction and strengthening of access road.<br>• Site clearance and preparation for WTGs and transmission line.<br>• Establishment and operation of batching plant.<br>• Transient storage of WTG components. | Permanent and temporary changes in land use | Construction | On completion of construction activities, land used for temporary facilities such as stockyard, batching plant and labor camps should be restored to the extent possible. | EPC Team | • Site inspection | Upon completion of task | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| | | | The land use in and around permanent project facilities should not be disturbed. | EPC Team | • Site inspection | Monthly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| • Construction and strengthening of access roads.<br>• Site clearance and preparation for WTGs, PSS and EHV line.<br>• Establishment and operation of batching plant | Changes in Topography and Drainage | Construction | Levelling and grading operations will be undertaken with minimal disturbance to the existing contour thereby maintaining the general slope of site. | EPC Team | • Site inspection | Monthly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| | | | Disruption/alteration of micro-watershed drainage pattern will be minimized to the extent possible. | EPC Team | • Site inspection | Monthly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| • Construction/ strengthening of access roads.<br>• Vehicular movement.<br>• Stripping and stockpiling of soil layers. | Soil compaction | Construction and Decommissioning | Vehicles should utilize existing roads to access the site to the extent possible. Existing roads should be widened to have the width and turning radius to accommodate the necessary vehicles for the Project | EPC Team | • Site Inspection | Monthly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| | | | Soil should be ploughed in compacted areas after completion of construction work | EPC Team | • Site inspection | Monthly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| • Construction/ strengthening of access | Soil Erosion | Construction and Decommissioning | Stripping of top soil should be conducted only when required and top soil should be retained for | EPC Team | • Site inspection and Record | Monthly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE |

| Project Activities | Impact/Issue | Project Phase | Mitigation Measures | Responsibility for Implementation of the Suggested Mitigation | Means of Verification | Frequency of Monitoring | Responsibility for Monitoring | Reporting Requirements |
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| roads.<br>• Selective clearing of vegetation in areas designated for WTG erection and transmission line.<br>• Stripping and stockpiling of soil layers. | | | landscaping. | | Keeping | | | Department of SA |
| | | | Stripping of top soil, excavation and access road construction should not be carried out during the monsoon season or during heavy winds to minimize erosion and run-off. | EPC Team | • Site inspection and Record Keeping | Monthly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| • Excavation for WTG foundations and electrical poles.<br>• Removal of WTGs.<br>• Removal of infrastructure. | | | Topography should be restored to the extent possible and re-vegetated to prevent soil erosion. | EPC Team | • Site Inspection | Monthly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| | | | The stock piles of top soil should be kept moist to avoid wind erosion of the soil. | EPC Team | • Site Inspection | Monthly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| | | | Site should be restored at the end of the Project lifecycle to pre-Project levels. | EPC Team | • Site inspection | One-time monitoring (repeat if goal is not achieved) | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| • Storage and transport of construction materials.<br>• Storage of oil and lubricants onsite. and<br>• Storage of waste materials onsite. | Soil contamination | Construction<br>Operation<br>Decommissioning | No unauthorized dumping of used oil and other hazardous waste should be undertaken at site. | EPC Team | • Site inspection | Monthly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| | | | Transport vehicles and equipment should undergo regular maintenance to avoid any oil leakages. | EPC Team | • Site Inspection | Monthly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| | | | Unloading and loading protocol should be prepared for diesel, oil and used oil respectively and workers should be trained to | EPC Team | • Site Inspection and Record Keeping | Monthly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |

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| | | | prevent/contain spills and leaks. | | | | | |
| • Storage of waste materials onsite. | Waste Generation | Construction<br>Operation<br>Decommissioning | Proper receptacles or designated areas should be closed, and periodic disposal should be ensured. | EPC Team | • Site Inspection and Record Keeping | Monthly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| | | | Construction and demolition waste should be stored separately and be periodically collected by an authorized treatment and storage facility. | EPC Team | • Site Inspection and Record Keeping | Monthly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| | | | Hazardous waste should be properly labelled, stored onsite at a location provided with impervious surfaces and in a secondary containment system. | EPC Team | • Site Inspection and Record Keeping | Monthly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| | | | All waste should be stored in a shed that is protected from the elements (wind, rain, storms, etc.) and away from natural drainage channels. | EPC Team | • Site Inspection | Monthly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| • Site preparation and excavation of WTG foundation.<br>• Internal tracks. | Particulate, fugitive and vehicular exhaust emission | Construction<br>Operation<br>Decommissioning | Diesel generators should be restricted to emergencies and power back up only to minimize air emissions. | EPC Team | • Site Inspection | Monthly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| • Widening, strengthening and maintenance.<br>• Construction of ancillary facilities.<br>• Operation of batching plant. | | Construction | Vehicle engines need to be properly maintained and should have a valid Pollution Under Control (PUC). | EPC Team | • Site Inspection and Record Keeping | Monthly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| | | | Speed of vehicles should be limited to 10-15km/hr. | EPC Team | • Site Inspection | Monthly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE |

| Project Activities | Impact/Issue | Project Phase | Mitigation Measures | Responsibility for Implementation of the Suggested Mitigation | Means of Verification | Frequency of Monitoring | Responsibility for Monitoring | Reporting Requirements |
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| • Demolition activities. | | | | | | | | Department of SA |
| | | | DG sets should be placed within enclosures and have an adequate stack height. | EPC Team | • Site Inspection | Monthly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| | | | Minimize stockpiling by coordinating excavations, spreading, regrading and compaction activities. | EPC Team | • Site Inspection | Monthly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| | | | Prevent idling of vehicles and equipment. | EPC Team | • Site Inspection | Monthly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| • Construction of WTGs.<br>• Domestic water for labor camp and contractor(s) | Depletion of water resource | Construction and Operation | Regular inspection for identification of water leakages and preventing water wastage. | EPC Team | • Site Inspection | Monthly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| | | | Optimum use of water during sprinkling on roads for dust settlement, washing of vehicles, concrete mixing, etc. | EPC Team | • Site Inspection | Monthly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| | | | Construction labor deputed onsite should be sensitized about water conservation and encouraged for optimal use of water. | EPC Team | • Site Inspection and Record Keeping | Upon completion of task(s) | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| • Operation of labor camp.<br>• Storage of hazardous substances and waste onsite.<br>• Operation of batching | Water Contamination | Construction<br>Operation<br>Decommissioning | Provision of septic tanks and soak pits (as per specification given in IS 2470 1995 Part I and II) onsite for treatment and disposal of sewage thereby minimizing the impacts of wastewater discharge. | EPC Team | • Site Inspection | Monthly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |

| Project Activities | Impact/Issue | Project Phase | Mitigation Measures | Responsibility for Implementation of the Suggested Mitigation | Means of Verification | Frequency of Monitoring | Responsibility for Monitoring | Reporting Requirements |
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| plant.<br>• Construction and demolition activities that causes dust and erosion. | | | Planning of toilets, soak pits and septic tanks and waste collection areas should be away from natural drainage channels. | EPC Team | • Site Inspection and Record Keeping | Monthly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| | | | Use of licensed contractors for management and disposal of waste and sludge. | EPC Team | • Site Inspection and Record Keeping | Monthly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| | | | Spills/leakage clearance plans to be adopted for immediate cleaning of spills and leaks. | EPC Team | • Site Inspection and Record Keeping | Monthly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| | | | Proper cover and stacking of loose construction material at batching plant and WTGs site to prevent surface runoff. | EPC Team | • Site Inspection | Monthly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| | | | Laborers should be given training towards proactive use of designated areas/bins for waste disposal and use of toilets. Open defecation and random disposal of waste should be strictly prohibited. | EPC Team | • Site Inspection and Record Keeping | Monthly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| | | | Garland drain should be provided at batching plant. | EPC Team | • Site Inspection | Monthly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| **Noise** | | | | | | | | |
| • Construction activities<br>• Vehicular movement<br>• Turbine operation | Increase in noise level | Construction, Operation and Decommissioning | Normal working hours of the contractor to be defined (preferable 7 am to 7pm). | EPC Team | • Site Inspection | Monthly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |

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| | | | Only well-maintained equipment should be operated on-site. | EPC Team | • Site Inspection and Record Keeping | Monthly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| | | | The final time schedule of the transport movements should be clarified with the authorities and communities. | EPC Team | • Site Inspection | Once | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| | | | In order to comply with the IFC noise limit of 45 dB(A) some turbines need to be operated in noise reduced modes. Using the noise reduced modes which are available for all considered turbine types, the IFC noise limit of 45 dB(A) can be complied with. Due to the fact, that the calculation was based on a worst-case assumption of 23 turbine locations, the noise assessment should be redone when the final and reduced turbine layout is available. At the time the final number of turbines is available, the noise reduction modes for the corresponding turbine type can be stipulated. | ESIA Noise consultant, EPC Contractor and SA Team | Site Inspection and Record Keeping | Once | EPC Contractor's Site HSE Officer | |
| | | | Regular maintenance of WTGs. | EPC Contractor and SA O&M Team | Site Inspection | Quarterly | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| **Occupational Health and Safety** | | | | | | | | |

| Project Activities | Impact/Issue | Project Phase | Mitigation Measures | Responsibility for Implementation of the Suggested Mitigation | Means of Verification | Frequency of Monitoring | Responsibility for Monitoring | Reporting Requirements |
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| • Various activities. Higher risk activities include working at height, lifting operations, live electrical work, use of vehicles/heavy equipment. | Injury, near-misses and fatalities for labor contracted on site. | Construction Operation Decommissioning | Implementation of an appropriate HSS management system prior to start of construction/operational phases (as described in the HSS plan). | EPC Team | • Site Inspection, regular review and reporting on implementation of the HSS management system. | To be agreed | SA HSE and EPC HSE Manager | Report from EPC Contractor's HSE Management to HSE Department of SA |
| | | | Implementation of system for selection and control of contractors/subcontractors/suppliers . Demonstration of how their HSS capabilities have been assessed/confirmed. | EPC Team | • Site Inspection, regular review and reporting on implementation of the system for selection and control of contractors, subcontractors, suppliers. | Monthly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| | | | Day to day compliance with HSS management system requirements (e.g. following procedures, use of equipment, use of PPE, demonstration of safe behaviors, appropriately trained personnel). | EPC Team | • Site Inspection | Continuous | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| | | | Monitoring and reporting of health and safety performance through site inspections, appropriate health and safety metrics, auditing of operations, and senior management review. | EPC Team; SA should periodically carry out their own audits. | • Site Inspection<br>• Audits | Regular monitoring. Reporting frequency to be agreed. | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| | | | All workers (regular and contracted) should be provided with training on Health and Safety policies in place | EPC Team | • Site Inspection and Record Keeping | Regular monitoring. | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE |

| Project Activities | Impact/Issue | Project Phase | Mitigation Measures | Responsibility for Implementation of the Suggested Mitigation | Means of Verification | Frequency of Monitoring | Responsibility for Monitoring | Reporting Requirements |
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| | | | with appropriate refresher courses throughout the life cycle of the Project. Training provision should be regularly monitored against the training requirements defined in the HSS management system. | | | Reporting frequency to be agreed. | | Department of SA |
| | | | Safe drinking water supply should be provided for the workers. | EPC Team | • Site Inspection | Monthly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| | | | Excavations should be completed in accordance with an appropriate excavation standard which will require temporary fencing. | EPC Team | • Continuous<br>• Site Inspection | Monthly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| | | | Security should be monitored at potential accident sites to restrict entry and prevent near misses, injuries and fatalities. | EPC Team | • Site Inspection | Monthly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| | | | An up-to-date first aid box should be provided at all construction sites and a trained person should be appointed to manage it.<br>Appropriate first aid provision should be provided at all construction/operational sites. | EPC Team | • Site Inspection and Record Keeping | Monthly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| | | | A safety or emergency management plan should be in place to account for natural disasters, accidents and any emergency situations. The nearest hospital, ambulance, fire station and police station should be identified in the implemented emergency management plan. | EPC Team | • Site Inspection | Monthly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |

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| Workers' Accommodations | Worker health & safety | Construction<br>Operation and<br>Decommission | • Providing adequate arrangements of drinking water, lighting, ventilation, bedding, bathing, laundry and other basic facilities in the workers' accommodation camps.<br>• Providing separate toilet facilities for men and women at the workers' accommodation camps as well as at the project site.<br>• Ensuring proper health-check-ups of all laborers employed at the project site.<br>• Facilitating healthcare services and medical care in case of sickness. | EPC Contractor and SA O&M Team | • Labor consultation<br>• Site verification | Monthly during the construction phase | EPC Contractor and SA O&M Team | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| **Biodiversity** | | | | | | | | |
| • Flora and Fauna | Loss of habitat (including endangered plant species), sedimentation, contamination, noise, vehicular movement and human-wildlife conflicts | Pre-construction | Pre-construction surveys to identify *Abies cilicica*, *Astragalus angulosus*, *Clinopodium libanoticum*, *Violia libanotica*, IPA qualifying species, key mammal species, reptiles and bats. Identify key bat roost caves. | EPC Team | • Site Inspection | As required following results of pre-construction surveys | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| | | Operation | Monitoring of all habitat reinstatement, translocation, recreation, offsetting or enhancement, and populations of key flora and fauna species as identified and implemented as required following pre-construction surveys. Develop an appropriately focused scope of operational period bat surveys following analysis of the results of the pre-construction | EPC Contractor and SA O&M Team | • Site Inspection | Monthly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |

| Project Activities | Impact/Issue | Project Phase | Mitigation Measures | Responsibility for Implementation of the Suggested Mitigation | Means of Verification | Frequency of Monitoring | Responsibility for Monitoring | Reporting Requirements |
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| | | | survey. Operational surveys would cover up to three years' activity periods. | | | | | |
| • Vegetation | Vegetation clearance<br>Loss of habitat (including endangered plant species), sedimentation, contamination, noise, vehicular movement and human-wildlife conflicts | Construction | Clearance of mature trees or continuous scrub should be avoided to the extent possible when planning the wind farm components. | EPC Team | • Site Inspection | Monthly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| | | | Vegetation clearance should be restricted to the Project activity area(s), particularly within Karm Chbat Nature Reserve, and should be undertaken outside the breeding bird season (March-August) or removal during that period only after a check by an ornithologist to ensure that no nesting birds are present. | EPC Team | • Site Inspection | Monthly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| | | | Separation and storage of top soil for use in restoration of all temporary project infrastructure and areas of temporary disturbance, e.g. track margins. Segregation of the topsoil of different habitat types will be required. | EPC Team | • Site Inspection | Monthly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| | | | Unnecessary disturbance to vegetation due to off-roading, fuel wood procurement, unchecked expansion of labor camps and destruction of floral resources should be prohibited. | EPC Team | • Site Inspection | Monthly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| | | | Local grass species can be seeded in disturbed areas during monsoon season. | EPC Team | • Site Inspection | End of construction phase | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE |

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| | | | | | | | | Department of SA |
| | | Operation | Maintain native vegetation on disturbed areas and right-of-way and remove invasive plant species. Monitor power-line right-of-way vegetation to avoid fire risk. | EPC Contractor and SA O&M Team | • Site Inspection | Monthly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| • Bat Species | Human persecution | Construction and Operation | Prepare and implement plan to identify and protect key bat roost caves in and around the Project site from human persecution. | EPC Team | • Site Inspection | Monthly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| • Construction Activities | Loss of habitat (including endangered plant species), sedimentation, contamination, noise, vehicular movement and human-wildlife conflicts | Construction and Operation | Construction activities should be conducted in a phased manner to prevent excessive noise, anthropogenic movement and vehicular movement throughout the entire wind farm area at any given time. All lights should be cowled and downward facing and avoid light spill onto surrounding non-construction areas. | EPC Team | • Site Inspection | Monthly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| | | | Laborers should be trained for dealing with wildlife as well as *dos* and *don'ts* when dealing with them. | EPC Team | • Site Inspection and Record Keeping | Monthly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| | | | Strict no hunting, poaching or trapping of wildlife policy should be communicated and enforced by the EPC contractor. | EPC Team | • Site Inspection and Record Keeping | Monthly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| | | | Project components should be planned such that they are sufficiently away from water bodies and any heavily vegetated areas to | EPC Team | • Site Inspection | Monthly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |

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| | | | reduce the impact on local wildlife. | | | | | |
| | | | Construction and transportation activities should be avoided at night (6:00 pm to 6:00 am) and should particularly avoid high faunal activity areas such as heavy vegetation and water bodies during dawn (6:00 am to 8:00 am) and dusk (5:00 pm to 7:00 pm). | EPC Team | • Site Inspection | Monthly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| | | | Temporary barriers should be installed around excavation areas. | EPC Team | • Site Inspection | Monthly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| | | | Waste materials should be covered and cleared periodically so as to not attract fauna to the construction site, particularly scavenging birds. | EPC Team | • Site Inspection | Monthly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| | | | If access roads are created in key crossing paths for herpetofauna or smaller mammals, then culverts of alternate paths should be provided to prevent road kills. | EPC Team | • Site Inspection | Monthly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| | | | Labor movement should be restricted to between construction camps and sites. | EPC Team | • Site Inspection | Monthly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| | | | General awareness regarding the presence of protected species (tawny eagle, Indian peafowl and monitor lizard) should be raised among the staff and laborers through interactive sessions | EPC Team | • Site Inspection and Record Keeping | Monthly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |

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| | | | (toolbox talks), charts, posters and trainings. | | | | | |
| | | | Good construction environmental management on site based on best practice guidance[2] to avoid spillage of fuels, other pollutants or excavated materials and provision of sufficient spill kits and similar to deal with any incidents. | EPC Team | • Site Inspection and Record Keeping | Monthly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| • Bird Species | Bird collisions | Construction | Burial of all on-site electrical cabling and installation of guy rope markers on any new met-masts to reduce potential collision risks for birds. | EPC Team | • Site Inspection | Monthly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| • Hazards associated with turbine blade movement | Bird and bat collisions, increased energy expenditure and barrier effects | Operation | Inter-turbine distance should be large enough that birds can avoid turbine blades and utilize minimal energy while doing so. | EPC Contractor and SA O&M Team | • Site Inspection | One-time monitoring of site prior to construction | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| | | | Avoid siting of WTGs near important habitat features such as water bodies, rocky terrain and thick vegetation. | EPC Contractor and SA O&M Team | • Site Inspection | One-time monitoring of site prior to construction | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| | | | WTGs should be sited in areas that are visible from a maneuverable distance for flying species and shouldn't be located near sudden changes of elevation, large trees or be blocked by any manmade/natural structures. | EPC Contractor and SA O&M Team | • Site Inspection | One-time monitoring of site prior to construction | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| | | | Flash lamps on the WTGs will | EPC Contractor and | • Site Inspection | One-time | EPC Contractor's | Report from EPC |

[2] https://www.nature.scot/guidance-good-practice-during-wind-farm-construction

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| | | | prevent bird collisions at night. Red or white blinking/pulsing lights will be used. | SA O&M Team | | monitoring of WTGs prior to operation | Site HSE Officer | Contractor's Site HSE Officer to HSE Department of SA |
| | | | Monitoring of bird and bat collision fatalities under and around each turbine following a standardized methodology potentially using trained dogs. Project specific monitoring protocol to be prepared based on best practice guidance[3].<br>If the results of the collision fatality monitoring identify that wind turbine shut down is necessary, some or all turbines will be shut down as appropriate and proportionate to identified confirmed or potential impacts. The installation of bird monitoring radar to inform all shutdown related activities will be considered. | EPC Contractor and SA O&M Team | • Site Inspection | Monthly between November and February and in June and July. Weekly during spring migration period of March to May and August to October. | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| | | | Repetition of the migratory period VPs ensuring that the 36 hours per season standard is met. To be completed for three years after the start of operation and commence at the first migratory period after start of operation, regardless of whether it is the spring or autumn period. | EPC Contractor and SA O&M Team | • Site Inspection | Monthly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| | | | Waste materials should not be left uncovered as it will attract birds and other fauna to the wind farm boundary. | EPC Contractor and SA O&M Team | • Site Inspection | Quarterly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |

[3] https://www.nature.scot/professional-advice/planning-and-development/renewable-energy-development/types-renewable-technologies/onshore-wind-energy/wind-farm-impacts-birds

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| | | | Restoring herb layers in the vicinity of the wind turbines will provide shelter for prey animals (e.g. lizards, snakes and rodents) and deter Egyptian vulture from flying into the wind farm. | EPC Contractor and SA O&M Team | • Site Inspection | Upon completion of task | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| • Electrical Hazards | Electrocution from live electrical components | Operation | Regular checking of the vacuums or holes in the towers for nesting bird species. | EPC Contractor and SA O&M Team | • Site Inspection | Quarterly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| **Community Health and Safety** | | | | | | | | |
| • Community health and safety hazards associated with the project. | Project/village interaction during transport, construction, operation and maintenance. | Construction and Operation | • Developing an onsite ESMS and EHS policy for the developer as well as contractors.<br>• Proper fencing and use of signages in excavated areas.<br>• Training of drivers carrying construction machinery regarding speed limits with careful consideration for village traffic.<br>• Conducting water sprinkling on the approach road leading to the project site throughout the construction phase.<br>• Conducting consultations with local community on H&S issues. | EPC Contractor and SA O&M Team | • Review of ESMS and EHS Policies<br>• Site verification. | Quarterly monitoring | EPC Contractor's Site HSE Officer | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |

| Project Activities | Impact/Issue | Project Phase | Mitigation Measures | Responsibility for Implementation of the Suggested Mitigation | Means of Verification | Frequency of Monitoring | Responsibility for Monitoring | Reporting Requirements |
|---|---|---|---|---|---|---|---|---|
| • Turbine operation | Shadow flicker | Operation | • Equip turbines with shadow flicker shut down modules | EPC Contractor and SA O&M Team | • Record Keeping | Continuous | SA O&M Team | Officer to HSE<br>Department of SA |
| **Social** | | | | | | | | |
| • Structural safety of project infrastructure, life and fire safety, public accessibility and management of emergency situations.<br>• The accidental throwing of a rotor blade as well as natural disasters might result in accidents impacting the local communities as well as other receptors such as the livestock in the project area. | | Construction and Operation<br><br>Operation | • Communicating with the local community regarding the accident risks and safety features of WTGs.<br>• Communicating the 'dos' and 'don'ts' to local community during emergency scenario.<br>• Involving local disaster management agencies during emergency situations. and<br>• Obtaining adequate third-party insurance cover to meet financial loss owing to emergency situations. | EPC Contractor and SA O&M Team | • Community consultation<br>• Site verification | Quarterly monitoring | | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |
| • Sudden and unplanned influx of a large migrant workforce might put pressure on local resources – water, health care services, daily consumables, food and grocery etc. | Construction | | • Surveying local communities in advance of and during the construction phase to ensure adequacy of local resources | EPC Contractor and SA O&M Team | • Labor consultation<br>• Site verification | Monthly during the construction phase | EPC Contractor and SA O&M Team | Report from EPC Contractor's Site HSE Officer to HSE Department of SA |

# 1. ESMP APPENDIX A - BIODIVERSITY ACTION AND MANAGEMENT PLAN (BAMP) FRAMEWORK

## 1.1. Introduction

This framework sets out, at a high level the measures that will be required to be undertaken by the project to mitigate project impacts sufficiently to avoid ecologically significant residual effects. It also includes measures required to achieve no net loss of natural habitats and to deliver net gains for critical habitats. It is not possible at this stage to provide a detailed BAMP as there remain data gaps to be filled by ongoing surveys.

### 1.1.1. Mitigation

A suitably qualified and experienced Ecological Clerk of Works (ECoW) or team of ECoWs, would be employed to input into the detailed BAMP upon its detailed development.

In general, the ECoW(s) would, amongst other tasks laid out here need to:

- Oversee or complete the further pre-construction surveys required to fill the gaps in data not available at the time of ESIA preparation;
- Update or input into the update to the Critical and Natural Habitat Assessment (CHA)/BAMPs following further data collection;
- Implement ecological mitigation and monitoring measures during construction;
- Train site staff in biodiversity issues;
- Implement ecological mitigation and monitoring measures during operation; and
- Prepare regular monitoring reports

#### 1.1.1.1. Habitats & Flora

##### 1.1.1.1.1. During Pre-Construction

- Completion of a pre-construction flora survey to identify habitats and key flora species as identified in the baseline section. This survey should be used to update the CHA where possible to identify those specific species for which a net gain will be required, but for which there is currently insufficient information to determine that.

##### 1.1.1.1.2. During Construction

- Preparation and provision of workforce toolbox talks and monitoring to ensure all staff understand the importance of the biodiversity controls in place, what they entail and how these controls should be followed. Particular key early tasks in workforce education will include implementation of a hunting ban on the Project site and prohibition of burning of vegetation for warmth or cooking.
- Minimization of the project footprint within Karm Chbat Nature Reserve. Footprint minimization will include measures such as adherence to strict working boundaries for all infrastructure construction.
- If any key flora species are identified during the pre-construction survey, areas of habitat inhabited by the plants should be avoided. If it is not possible to avoid examples or areas of the species

detailed in the baseline, every effort should be made to reduce the impact and further offsetting would be required.

- The CHA has been completed as far as possible with the data provided to Ramboll. It has identified areas of critical and natural habitats on the Project site for a number of species and habitat types, respectively. In order to be compliant with IFC PS6 and EIB Standard 3, it will be necessary to deliver a net gain for the species for which critical habitat is considered to be present. It will also be necessary to deliver no net loss of natural habitats where these do not overlap with areas of critical habitat already being offset to the higher net gain requirement. Although it has not been possible to complete a detailed identification of the level of offsetting required or the locations where this might occur, as the triggers of critical habitat are mostly plant species, the relatively small areas of habitat loss associated with the proposed development mean that sufficient areas for effective offsetting are likely to occur on land under the project's control, i.e. other areas within the Project site that are not being disturbed. The detailed habitat and vegetation surveys being undertaken, of which only early results were available for the ESIA, should be used to identify potential suitable critical and natural habitat offset locations.
- Offsetting will need to be completed based on good practice guidance, e.g. the Business and Biodiversity Offsets Program (BBOP) . A key consideration for offsetting of habitat loss is equivalency, i.e. it is not a simple case of replacing an area of lost habitat with the same area of replacement habitat. A consideration will need to be made of the quality of the habitat being lost versus the quality of any offset site and the inherent ability of any offset to deliver sufficient additionality to be considered as a suitable offset site. The time that it will take for the offset site to reach a comparable state to that being lost will need to be factored into the calculations. The risk of failure of any offsetting, translocation or transplanting will also need to be considered as part of the process, whether that risk be associated with the type of species being offset, the type of interventions required or risks from other factors e.g. weather and/or human disturbance.
- It is recommended that following completion of the survey work, the CHA is updated to confirm final critical and natural habitat offsetting requirements and an offsetting strategy is developed as part of the ESMP process.
- Implementation of rehabilitation measures to mitigate the loss of habitat, such as vegetation remediation, translocation or creation of new habitat areas.
- Proper management of excavation materials. Rubble from site excavations should not be allowed to spread down slopes. Clear working procedures should be defined, implemented and supervised.
- Separation and storage of top soil for use in restoration of all temporary project infrastructure and areas of temporary disturbance, e.g. track margins. Segregation of the topsoil of different habitat types will be required.
- Soil management would also include observance of appropriate biosecurity controls to prevent the spread of invasive plants or floral diseases. This would involve washing vehicles and equipment to remove particles of vegetation and loose soil, with this done in specific "wash down" areas. Any invasive plants that are removed during vegetation clearance would need to be disposed of appropriately, in a safe way that does not allow it to spread.
- Good construction environmental management on site based on best practice guidance to avoid spillage of fuels, other pollutants or excavated materials and provision of sufficient spill kits and similar to deal with any incidents.

#### 1.1.1.1.3. During Operation and Maintenance

- Monitoring of all habitat reinstatement, translocation, recreation, offsetting or enhancement as identified and implemented as required following pre-construction surveys.
- Remove invasive plant species during routine vegetation maintenance.
- Monitor power-line right-of-way vegetation to avoid fire risk. Remove blowdown and other high-hazard fuel accumulations.

#### 1.1.1.1.4. During Decommissioning

- Typically, the same controls set out for construction will apply.
- Minimization of activities within Karm Chbat Nature Reserve. Footprint minimization will include measures such as adherence to strict working boundaries for all infrastructure decommissioning.
- Good construction environmental management on site based on best practice guidance to avoid spillage of fuels, other pollutants or excavated materials and provision of sufficient spill kits and similar to deal with any incidents.
- Preparation and provision of workforce toolbox talks to ensure all staff understand the importance of the biodiversity controls in place and exactly what they entail.

### 1.1.1.2. Terrestrial Fauna

#### 1.1.1.2.1. During Pre-Construction

- Completion of pre-construction fauna walkover survey to identify potential habitat for key mammal and reptile species, followed by camera trapping to confirm species considered to be present/status of any dens found.

#### 1.1.1.2.2. During Operation and Maintenance

- If found to be present during pre-construction surveys, monitoring of populations of endangered reptiles as appropriate, including monitoring of any offsets or enhancements for those species.

### 1.1.1.3. Bats

#### 1.1.1.3.1. During Pre-Construction

- A full year of activity surveys will be competed pre-construction, adding to the information gathered from the spring activity surveys used to inform this assessment. As per best guidance, a full year of survey data will allow for a more accurate understanding of bat activity across the site, temporally and spatially, which will enable a more accurate and informed impact assessment which in turn will determine the most effective mitigation required.

#### 1.1.1.3.2. During Construction

- A presumption for avoidance of all artificial light as far as possible. All lights should be cowled and downward facing and avoid light spill onto surrounding non-construction areas.
- Preparation and subsequent implementation of plan to identify and protect key bat roost caves in the area on and around the Project site from human persecution, such as identified elsewhere in the area.

#### 1.1.1.3.3. During Operation and Maintenance

- Once the pre-construction survey results have been analyzed, it will be possible to develop an appropriately focused scope of operational period bat surveys. Surveys would cover up to three years' activity periods.
- Given the high levels of activity recorded at SA2, SA6, SA9 and SA20 and predominately from species identified as high or medium risk in terms of collision (common pipistrelle, Kuhl's pipistrelle and serotine) it is recommended that turbines situated at these locations are subject to operational adjustments. Raising the cut-in speed at which the turbine begins to generate electricity, thus preventing movement in low winds, notably decreases bat mortality rates[1] along with feathering of blades i.e. adjusting the angle of the blade parallel to the wind or turning the unit away from the wind[2].. In addition, operational times could be altered – stopping turbines at these locations between the most active periods i.e 20:00-05:00.
- Monitoring of bat collision fatalities under and around each turbine following a standardized methodology potentially using trained dogs. Monitoring to be completed monthly and concurrently with bird collision monitoring.
- Preparation and subsequent implementation of plan to identify and protect key bat roost caves in the area on and around the Project site from human persecution, such as identified elsewhere in the area.

## 1.2. Ornithology

### 1.2.1. Mitigation

Due to the large number of ecological and ornithological mitigation proposed for the proposed Lebanon Wind Power Wind Farm, it is recommended that a suitable qualified Ecological Clerk of Works (ECOW) be employed for the project to ensure the implementation of the BAMP.

[1] Horn J.W., Arnett E.B. & Kunz T.H. (2008) Behavioral responses of bats to operating wind turbines. *The Journal of Wildlife Management,* 72, 123–132.

[2] Hein, C, D and Schirnacher, M, R. (2016). Impact of Wind Energy on bats: A Summary of our Current Knowledge. Human-Wildlife Interactions 10 (1), Pp 19-27.

#### 1.2.1.1. Construction and Decommissioning

Nest Destruction

Where required, vegetation would be removed outside of the bird breeding season (March-August). The following vegetation removal deterrence methods would also be used to ensure ground nesting birds do not nest on the site following vegetation clearance:

- Iridescent tape across the construction areas prior to construction activities;
- Bird deterring machines which produce intermittent loud noises; and
- Walking of the cleared area by individuals on a regular basis to prevent birds settling and to monitor if any birds are settling to nests on areas close to the planned construction activity.

Where vegetation has not been removed outside of the breeding bird season and must be removed during the breeding bird season, then pre-clearance surveys must be undertaken by a suitably experienced ornithologist. These surveys would identify any potential nests in the vegetation to be removed and then establish suitable "no go" buffers around these nests, to prevent the nest being destroyed or disturbed. Buffers would be species specific and determined by the ECOW.

In addition to the above, prior to commencement of decommissioning activities, walkover surveys would be completed in habitats suitable for and known to be used by breeding bird species as to identify any previously unknown nest sites.

#### 1.2.1.2. Operation

Collision Risk

The results of the CRA suggest that significant collision risk impacts not predicted. However, it is acknowledged that the CRA is based on assumptions and incomplete datasets and a significant collision risk impact for species could still occur. The bird migration route through the north-east of Lebanon is an internationally important route for many species and so it is recommended that additional safeguards are implemented to prevent significant collision risk events.

This mitigation would rely heavily on the further monitoring work proposed, see **Section 14.5.2,** including continuing the migration season VP surveys, undertaking carcass searches beneath the constructed turbines and the installation of a bird detecting radar system.

It is proposed that mitigation would involve the shutdown of the turbines during periods of peak collision risk potential, such as periods of peak bird migration movement or poor weather. Shutdown would be achieved by adjusting the blade angle to be perpendicular to the wind and applying the brake to prevent any blade rotation. Further information on this process, and potential compensation, will be provided in the Bird Monitoring Protocol being produced by the Lebanese Ministry of Environment.

It should be noted that, based on the results of the surveys previously undertaken on the site, mitigation for collision risk impacts is not currently considered to be required. However, this is still to be confirmed following further surveys.

## 1.3. Biodiversity Monitoring/Additional Good Practice Measures

### 1.3.1. Bats

To prevent further persecution and destruction of bat roost caves protective metal grates should be installed across the entrances of all bat roost caves identified during the December 2017- March 2018 surveys. These would prevent members of the public from accessing the caves and disturbing or damaging the roosts, as observed previously.

## 1.4. Ornithology Monitoring/Additional Good Practice Measures

### 1.4.1. Construction/Decommissioning

Hunting Ban

A significant impact on birds migrating through Lebanon is the culture of hunting that exists. In spite of laws that make the killing of migrating birds illegal, thousands are still killed each year[4] impacting populations in their breeding grounds in Europe and Asia. It is proposed that all hunting within the wind farm area is banned, this area is shown in **Figure 14.4**. This would not only protect the birds using the wind farm area but would also prevent damage to the turbines themselves.

The site would be secured during construction, preventing public access to the area. It is proposed to maintain this during the operation phase, with security staff responsible for preventing members of the public accessing the wind farm site.

Efforts should be made to invest in public awareness and support for the hunting ban among local residents. This would take the form of increased nature education and training of local bird recorders. Surveyors from the project surveys would be a good resource to educate locals of the species of birds and why Lebanon is an Internationally important bird flyway.

Artificial Light

The use of artificial light should be avoided where possible as steady white lights can attract prey, such as moths, and the prey can attract predators, such as moth eating birds like hobbies and red-footed falcons. Instead, it is proposed that red lights or pulsing/blinking lights are used instead.

Waste Disposal

To prevent attracting scavenging bird species to the site, any waste produce by the workers on the site would need to be disposed of following a detailed plan. Waste should not be stored or deposited where it is open to the air, as this would attract birds to the site. This could, inadvertently, lead to the creation of a de-facto feeding station for scavenging birds such as corvids, kites and vultures.

Disturbance and Displacement

Identified nests of birds of prey, such as common kestrel and short-toed snake eagle, are considered far enough away from any construction area and disturbance impacts are unlikely. However, the ECOW would be responsible for monitoring both nest sites and ensuring that they remain productive through the construction/decommissioning works.

[4] Committee Against Bird Slaughter (CABS) (2013) Report on the hunting of migrant birds in the Lebanon - affected species and their conservation status in the EU.

### 1.4.2. Operation

Migration VP Surveys

It is recommended to continue the migratory season VPs during the start of the operational phase of the proposed development. These would commence as soon as the project is operational and would be undertaken following the methods described in this chapter, although with an increased survey effort to meet the 36 hours per migration season as suggested by SNH Guidance.

During each VP watch, flight activity by target species[5] will be recorded using the same details collected before:

- Flight Number;
- Time;
- Date;
- Species;
- Number of Birds;
- Flight height; and
- Total time of flight including time spent at each height.

In addition to this information, surveyors will record if any birds display any flight behaviour apparently associated with the presence of the turbines (avoidance) or if any were seen to collide with a turbine (collision). Observations would use the following terminology after Meredith (2002)[6]:

- Weave - Weaving flight line up to maximum height of turbine;
- Direct - A direct flight line, within the turbine envelope but clearly in a line up to maximum turbine blade height, avoiding turbines;
- Horizontal - A bird flying towards a wind farm site, which takes avoiding action by a horizontal movement (i.e. no change in height) so as to take it around the edge of the turbines;
- Vertical - As for horizontal, but this time, the bird gains altitude to take it over the top of the wind farm site;
- Bullet - Flight behavior with no avoiding action with regards to turbines (or other infrastructure);
- Hit - A recorded collision between a bird and a turbine (or other infrastructure);
- Avoid - Avoidance behavior near a turbine, generally taken at short notice and likely to appear as a sudden change in direction and/or height; and
- Other – Any other behavior not easily classifiable into any of the above categories.

Carcass Searches

As well as the VP surveys, searches for collision victims will be completed under the turbines. Visual searches within an area at least five metres greater than the length of each turbine blade will be undertaken. The surveys would be stratified, with a third of the turbines survey during each visit. It would also be randomised, with a different set of turbines chosen to be surveyed on each visit. These surveys would be undertaken ten times per month during the migration period (mid-February to mid-May and mid-August to mid-November) and three times per month during the rest of the year. The

[5] Target species include all species of raptor, cranes, storks and pelicans.

[6] Meredith, C., Venosta, M., & Ressom, R. (2002) *Cordington Wind Farm Avian Avoidance Behaviour Report*, 2002. Biosis Research Report.

amount of time spent searching will be standardised to allow comparability between turbines and visits.

Prior to starting the surveys, both scavenger and surveyor bias will be calibrated. This will be completed by leaving proxy carcasses[7] under turbines in locations where they can be seen by static trail cameras to record how much time passes before a carcass is removed by scavenging animals.

A similar process will be used to calibrate how successful surveyors are at locating carcasses. One surveyor will place a number of carcasses, ideally of differing sizes randomly under turbines and a different surveyor would search as described above. This process will be repeated across a number of turbine locations and for all surveyors involved in the searching. How many of the placed carcasses which are found can then be used to identify how effective the surveyors are at finding carcasses.

A project specific monitoring protocol would be developed. This will need to be adapted following the publication of the Bird Monitoring Protocol by the Lebanese Ministry of Environment.

Radar Bird Monitoring Equipment

Radar equipment to monitor volumes of migrating birds approaching the proposed development would be considered. The requirement for this would be based on the expectations of the Bird Monitoring Protocol currently being prepared by the Ministry of Environment. It is anticipated that this would involve guidance on the specifications of system appropriate and how it should be utilised.

The radar system would have a more direct feedback into the shutdown mitigation of the proposed development, as it would detect large volumes of birds approaching so large collision risk events can be avoided. The other monitoring methods would have an indirect feedback into the shutdown mitigation.

**Table 1.0 Responsibility for Monitoring/Additional Good Practice**

| Task | Responsible Party |
|---|---|
| Hunting ban | Security staff |
| Avoid the use of artificial light | ECOW |
| Waste disposal | ECOW |
| Monitoring nest sites for disturbance/destruction | ECOW |
| Migration VP surveys | Sustainable Akkar |
| Carcass searches | Sustainable Akkar |
| Radar bird monitoring | Sustainable Akkar |

[7] Proxies required as its unlikely that access to any hooded vulture carcasses will be possible. A bird of similar size and colouration should be used. It will be acceptable to use man-made dummies in the surveyor bias trials as that is a test of the surveyors' visual abilities. However, for the scavenger bias trials, real carcasses should ideally be used.

# ESMP APPENDIX B – CONSTRUCTION PHASE HEALTH, SAFETY AND SECURITY FRAMEWORK

| Construction Phase Health Safety and Security (HSS) Plan | | | | |
|---|---|---|---|---|
| **No** | **Title of Measure** | **Description** | **Organisational Responsibility** | **Date** |
| 1 | Development of an appropriate health safety and security management system which will cover the construction and commissioning phase, | The Operator will develop and implement a Health Safety and Security (HSS) management system appropriate to control the risks identified during the construction and commissioning phase of the project. The system will follow the main requirements of a recognised health and safety management system (such as HSG 65, ISO45001 etc). The system will include setting of appropriate objectives, responsibilities and authorities of personnel, ensuring that appropriate competent resources are available, arrangements for implementation, and arrangements for reporting, monitoring, review and corrective action.<br><br>The HSS management system will set out the minimum requirements for all contractors involved in the project, including topics such as risk assessment, work at height, confined spaces, excavation safety, hot work, electricity, use of vehicles and heavy machinery, lifting operations, security, temporary working camps and welfare facilities, health monitoring, adverse weather conditions, training, consideration of language barriers, emergency response, | Operator | Prior to start of construction |

| Construction Phase Health Safety and Security (HSS) Plan | | | | |
|---|---|---|---|---|
| **No** | **Title of Measure** | **Description** | **Organisational Responsibility** | **Date** |
| | | monitoring and auditing, use of sub-contractors, etc.<br><br>Where temporary working camps are provided for construction workers a system will be implemented to confirm that the accommodation meets good international practice, e.g. as described in guidance documents such as "Workers Accommodation Processes and Standards", published by IFC/EBRD in August 2009.<br><br>Specific requirements will be included for road construction, including a transport management plan to establish safe work zones for workers, traffic controls and training of workers, control of noise/vibration. These will include measures to protect residents from traffic (in the event of removal of pedestrian access bridges for movement of large loads alternative arrangements will be needed to allow safe crossing of roads by people).<br><br>The Operator will ensure the presence of competent resource to develop and implement an appropriate health and safety management system, and to ensure appointed contractors have an equivalent system aligned to its requirements.<br><br>It is not intended to have an externally certified management system. | | |

| Construction Phase Health Safety and Security (HSS) Plan | | | | |
|---|---|---|---|---|
| **No** | **Title of Measure** | **Description** | **Organisational Responsibility** | **Date** |
| 2 | System for selection and control of contractors/subcontractors | The management system will include arrangements for selection, management and monitoring of contractors/subcontractors with respect to their HSS capabilities and performance.<br><br>Prior to selection of contractors, the Operator will review contractor health and safety management systems against its own, to ensure they satisfy the minimum requirements relating to their activities.<br><br>Following selection and throughout the construction project, the Operator will implement adequate arrangements for monitoring and auditing of contractors and sub-contractors against the health and safety management system, to ensure adequate standards of health and safety management are maintained. | Operator | Prior to start of construction |
| 3 | Transport/driving | The operator will implement a system to control risks associated with all vehicles and transport. These will include risk assessment, design of facilities to achieve vehicle/pedestrian segregation, training requirements, standards/procedures (e.g. working hours, behaviours vehicle inspection and maintenance), vehicle monitoring, and journey planning. | Operator/<br><br>Contractor | Prior to start of construction |
| 4 | Training and competence | Health and Safety training and competence | Operator/ | Prior to and throughout the |

| Construction Phase Health Safety and Security (HSS) Plan | | | | |
|---|---|---|---|---|
| **No** | **Title of Measure** | **Description** | **Organisational Responsibility** | **Date** |
| | | requirements for roles/tasks will be defined and a system implemented to ensure personnel are competent and have appropriate training for the tasks undertaken. This will include defining the H&S expectations, competencies and training requirements of various staff grades (e.g. contractors, supervisors, managers).<br>H&S induction safety requirements will be defined. | Contractors | construction process |
| 5 | First Aid Provision | Arrangements will be implemented to ensure appropriate first aid protection, including equipment and training. This will consider remote working operations. | Operator/<br>Contractors | Prior to start of construction |
| 6 | Remote/lone working | Arrangements to manage health and safety risks during remote/lone working will be defined and implemented. This will require assessment of risk and use of appropriate systems, procedures and training (including communications/first aid arrangements). | Operator<br>Contractors | Prior to start of construction |
| 7 | Emergency preparedness and response. | The management system will include appropriate procedures to respond to potential emergency situations (e.g. fire, security incident, press coverage, evacuating wind turbine nacelles, etc), including arrangements for training personnel and testing and evaluating the effectiveness of the response procedure.<br>Emergency situations will | Operator | Prior to start of construction |

| Construction Phase Health Safety and Security (HSS) Plan | | | | |
|---|---|---|---|---|
| **No** | **Title of Measure** | **Description** | **Organisational Responsibility** | **Date** |
| | | also be considered in other elements of the management system, such as provision of first aid, fire evacuation, lone/remote working etc. | | |
| 8 | Commissioning Health and Safety Plan | A specific health and safety plan for commissioning of the system will be prepared and implemented to address the risks associated with the commissioning processes, for example, the co-ordination of contractors and ensuring control of hazardous energy during commissioning. | Operator/<br>Contractors | Prior to the start of commissioning. |

# ESMP APPENDIX C – HUMAN RESOURCES POLICY

## Human Resources Policy

Lebanon Wind Power sal and Sustainable Akkar sal accept and promote the following principles that must inform the management of its human capital:

a Fully commitment to the Lebanese labors law along with its decrees and decisions.

b An appropriate framework of labor relations and of agreed mechanisms to bring the organization into line with corporate and social requirements, promoting the objectives of competitiveness and business efficiency.

c Design of a value offering that favors the selection, hiring, promotion and retention of talent, consisting of competitive remuneration and a working environment that promotes the professional growth of the Group's employees, based on equal opportunity, the commitment to the Purpose and Values of the group and the business enterprise of the Group, and reconciliation between personal and professional life.

d The development of consistent human resources processes that progress in the implementation of a talent culture in all countries in which the Group does business, respecting local particularities and the special framework of strengthened autonomy of the listed country sub-holding companies.

e The definition as a strategic objective of the conduct of labor relations based on equality of opportunity, particularly between genders, non-discrimination, respect for diversity and no forced labor. Measures must also be promoted to achieve a favorable environment that facilitates reconciliation of personal and working life, complying with the law applicable in each country and following best international practices.

f The consolidation of stable and quality jobs.

g A remuneration system that allows for the attraction and retention of the best professionals and the objectives of which are aligned with those of the Group.

h Appreciation of the contribution of all professionals to the Group's creation of value and to its growth.

i Recognize and value family and personal connections among the professionals of the Group, a necessary consequence of the Group's strong local roots within the communities in which it has historically done business, and establish specific measures ensuring that employees with such connection are not favored or discriminated against in hiring and promotion processes, nor is there any violation of the principle of equal opportunity.

j The process of selecting, hiring and promoting professionals of the companies of the Group shall ensure that all of its professionals are persons who are respectable and appropriate, aligned with the provisions of the Purpose and Values of the group and with the principles contained in the Code of Ethics, assessing their history and rejecting those who lack the required appropriateness due to the background thereof.

# ESMP APPENDIX D – RECRUITMENT AND SELECTION POLICY

## Recruitment and Selection Policy

Lebanon Wind Power sal and Sustainable Akkar sal accept and promote the following basic principles that must inform all recruiting and hiring activities:

a Develop a program for standardizing the recruitment procedures of the Company, so that they:

- Respect equal opportunities and promote non-discrimination by reason of race, color, age, gender, marital status, ideology, political opinion, nationality, religion, or any other personal, physical, or social condition. This will guarantee the ability of the Company to recruit, motivate, and retain the best talent and uphold the ethics and legal principles expected from a trusted employer, consistent and aligned with the values of its customers, shareholders, employees, and community.
- Include all professionals who have the required competency profile, without exclusions of any kind that could limit the effectiveness of the selection process.
- Ensure that selection is carried out exclusively on the basis of merit and capability, guaranteeing that all candidates are treated equally throughout the process. The selection processes shall therefore be designed to avoid any kind of discrimination and with no forced labor.
- Enable the identification and assessment of the ideal candidates according to the knowledge, attitudes, abilities, and competences required for the different job positions.
- Comply with applicable labor laws in each country regarding recruitment and selection.
- Guarantee absolute confidentiality to all candidates, in accordance with personal data protection laws and regulations.

b Encourage the access of young people to their first job through scholarship programs and other agreements.

c Priority of recruitment shall be given to the inhabitant of the surrounding villages of the projects.

d Provide candidates with a competitive offer that favors the recruitment and hiring of the best professionals.

e The Group's offer must be based upon competitive remuneration, a work environment based on equal opportunity, business enterprise, a balance between personal and professional life, and reconciliation thereof.

f The Group will promote the hiring of its professionals using stable and permanent contracts.

g Standardize working conditions and the benefits received by part-time and full-time employees.

h Endeavour to ensure that selection and hiring processes are objective and impartial and do not influence the hiring of family members of Group professionals or persons with a similar connection, avoiding the participation of the professionals with which they are connected in their selection process.

i Favor the hiring of employees from excluded groups and of persons with different skills.

# ESMP APPENDIX E- WORKERS' GRIEVANCE MECHANISM

**Lebanon Wind Power Project Workers' Grievance Mechanism**

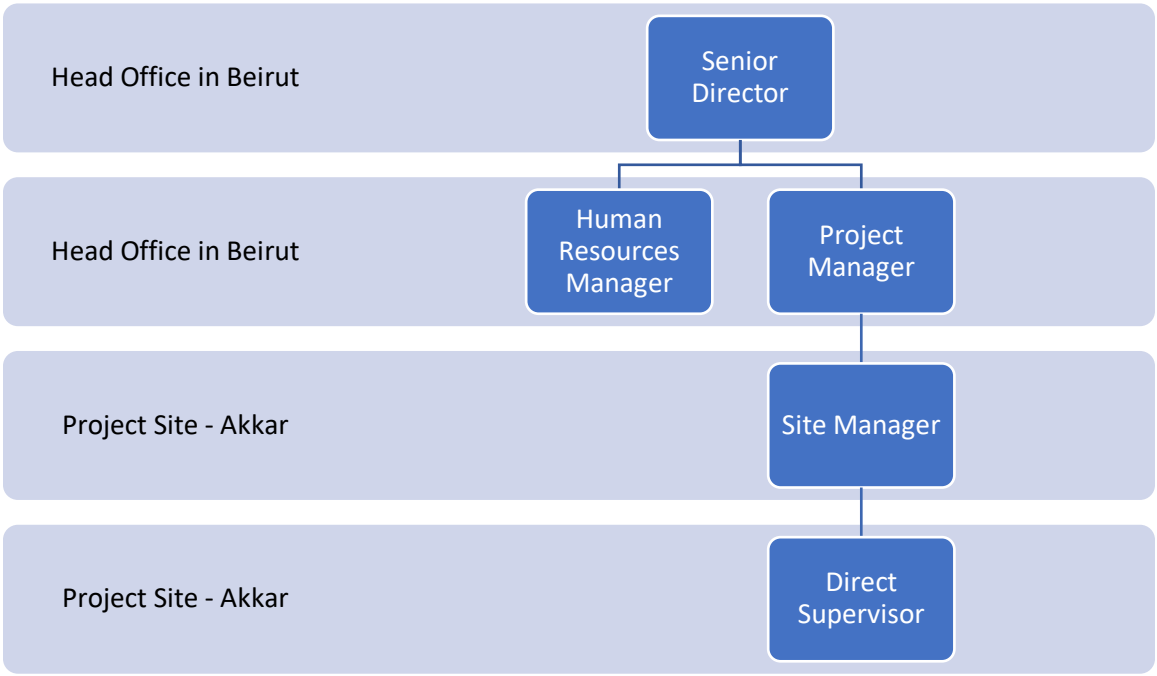
### Objective

To receive and facilitate resolution of Project workers' concerns and grievances about the Project. The grievance mechanism seeks to resolve concerns promptly, using an understandable and transparent consultative process that is culturally appropriate and readily accessible.

### Roles and Responsibilities

The Human Resources Manager is responsible for management of this workers' grievance mechanism, with the involvement of additional key staff as indicated in **Figure 1**.

**Figure 1. LWP Project Human Resources Organization Chart**




### Process

A variety of methods are available through which Project workers' (both direct, contracted and sub-contracted workers) can lodge grievances. These include:

- Face-to-face meetings with the Human Resources Manager, the worker's manager and/or other relevant Project representatives;
- Written communication (e.g. email, letter) directed to the Human Resources Manager, the worker's manager and/or relevant Project representative or left in suggestion boxes, which will be located in

the Human Resources Department, at the Community Relations Office in Kfartoun and in each Affected Community; and

- Telephone call placed to the Human Resources Manager, the worker's manager and/or a relevant Project representative.
- Anonymous grievances may also be submitted to the Human Resources Manager.

All grievances will be recorded in a grievance log in the Workers' Grievance database. This will include a summary of the grievance, the resolution or agreement on proposed actions (between the Project and the complainant), and monitoring actions taken in response to the grievance. The grievance log and grievance close-out form will be stored in the Grievance database.

The key steps of the Process are as follows:

1. Identification of grievances. This could be by depositing a grievance in a suggestion box, or in person, by phone, letter, or email using the contact details below:

   Name: Ms. Maya Tayyar
   Title: Office Manager / Human Resources Manager
   Address: 1st floor, An-Nahar Bldg, Martyrs' Square, Beirut Central District, Lebanon
   Email: mt@sustainableakkar.com
   Telephone: +961-1-990680-1-2
   Mobile: +961-81-477204

2. Grievance is recorded in a 'grievance log' (written and electronic) within 2 days of receipt. The grievance log will be held in the Human Resources Department. The significance of the grievance will then be assessed within five working days using the criteria outlined in Box 1.
3. Grievance is acknowledged through a personal meeting, phone call, or letter as appropriate, with the complainant no more than 10 working days after submission, if the complainant is not anonymous. If the grievance is not well understood or if additional information is required, clarification should be sought from the complainant during this step.
4. The Direct Supervisor and the Site Manager are notified of all Level 1, 2 or 3 grievances and the Project Manager is notified of all Level 3 grievances. The Project Manager or Human Resources Manager will support the Direct Supervisor and the Site Manager in deciding who should deal with the grievance and determine whether additional support is required to respond to the complainant. Grievances may also be submitted directly to the Human Resources Manager.
5. The Direct Supervisor delegates the grievance to the relevant departments(s)/personnel to develop a response and if needed, a corrective/preventive measure (e.g., Site Manager, Human Resources Manager, relevant medical or administrative departments, contractors or sub-contractors).
6. A response is developed by the Direct Supervisor within 14 working days after acknowledging the grievance, if the complainant is not anonymous, with input from the relevant Project personnel and others, as necessary.
7. The response is signed-off by the Project Manager for Level 3 grievances, the Site Manager for Level 2 grievances and the Direct Supervisor for Level 1 grievances within 5 working days of preparing a response. The sign-off may be a signature on the grievance log or an e-mail which

indicates agreement, which should be filed by the Direct Supervisor and referred to in the grievance log.

8. Communication of the response should be carefully coordinated. The Human Resources Manager will ensure that an approach to communicating the response is agreed and implemented, taking into consideration cultural sensitivities and implementation of any preventive/corrective measure.
9. Record the response received from the complainant to help assess whether the grievance is closed or whether further action is needed. The Direct Supervisor or Site Manager should use appropriate communication channels, most likely telephone or face to face meeting, to confirm whether the complainant has understood and is satisfied with the response. The complainant's response should be recorded in the grievance log.
10. Close the grievance with sign-off from the Human Resources Manager. The Human Resources Manager will assess whether a grievance can be closed or whether further attention is required. If further attention is required, the Direct Supervisor should return to Step 2 to re-assess the grievance.

Once the Human Resources Manager has assessed whether the grievance can be closed, he/she will sign off or seek agreement from the Project Manager for Level 3 grievances, to approve closure of the grievance. The agreement may be a signature on the grievance log or an equivalent e-mail, which should be filed by the Direct Supervisor and referred to in the grievance log.

The grievance management process enables complaints to be lodged anonymously. Complainants are not required to provide their name when lodging a grievance. This is reflected in the grievance log and close-out template). All grievances will be archived into the Workers' Grievance Database. All grievances will be recorded, investigated and closed-out in the same manner – as described above.

**ESMP Appendix F- Workers Grievance Log**

| | | | | | |
|---|---|---|---|---|---|
| Document: | **Workers' Grievance Log** | | | | |
| Revision n: | 0 | | | Date: | |
| Prepared by: | Human Resources Manager | Reviewed by: | | Approved by: | |
| Revision changes | | | | | |

| Date of Grievance Submission | Grievance logged in by | Name of Complainant (not required) | Contact Information for Complainant (not required) | Nature of Grievance | Grievance Level (1,2, or 3) | Acknowledgement of Receipt of Grievance, Date | Resolution of Grievance- Describe the steps taken to resolve the grievance and the outcome | Response Date | Confirmation of Complainant's Agreement to the Resolution | Approved by (level 1, level 2 or level 3) | Date of final resolution |
|---|---|---|---|---|---|---|---|---|---|---|---|
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# ESMP APPENDIX G – CORPORATE SOCIAL RESPONSIBILITY (CSR) PROGRAM-DISCUSSION PAPER

## Sustainable Akkar and Lebanon Wind Power Wind farms

## Corporate Social Responsibility (CSR) Program

## Discussion Paper

## July 8, 2019

### 1. Target groups

#### a. Main concerned communities

| # | Location | Project Component | Community |
|---|---|---|---|
| 1 | Rweimeh | SA and LWP Main Substation | Rweimeh - Jaafar family |
| 2 | Karm Chbat | LWP wind turbine location & LWP substation | Jaafar family |
| 3 | Aarouba/ Fnaidek | LWP Wind turbines location | Fnaidek Municipality |
| 4 | Aandqet | SA Wind turbines | Aandqet Municipality |
| 5 | Jabal Akroum | SA Wind turbines | Kfartoun Municipality<br>Sehleh Municipality |

#### b. Vulnerable groups to be included in project design

- Women
- Persons with disability
- Elderly
- Youth
- Refugees when applicable
- Gypsies when applicable

### 2. Example of Focus areas

- Women empowerment
- Livelihoods
- Education
- Environment
- Child development

## 3. Reported needs and ideas suggested my communities/municipalities

| # | Location | Community | Needs and ideas | Interviewed key informants |
|---|---|---|---|---|
| 1 | Rweimeh | Rweimeh - Jaafar family | Improvement of water infrastructure (reparation of pipes)<br>Building a new water well,<br>Rehabilitation of Mosques,<br>Rehabilitation of School,<br>Installation of Pico-PV systems | Jaafar family focal point |
| 2 | Karm Chbat | Jaafar family | Ecotourism project | Jaafar family focal point |
| 3 | Aarouba/ Fnaidek | Fnaidek municipality | Ecotourism project in Ammouaa, cable car, bed & breakfast<br>Rehabilitation of Mosques | Mayor |
| 4 | Aandqet | Aandqet municipality | Restoration of the church, reforestation, social services, elderly day care and activities.<br>Sponsorships of the local football team | Mayor, CBOs and CSO |
| 5 | Jabal Akroum | Kfartoun Municipality<br>Sehleh Municipality | Rehabilitation and upgrading of a reception facility for weddings and other events<br>Rehabilitation of Mosques, Public schools, Creation of Primary Healthcare centers,<br>Installation of Pico-PV systems for houses, public institutions etc.… | Mayors |

## 4. Other ideas that could be proposed

- Vocational and skills trainings for women (food processing "mouné"; English lessons, sewing lessons, etc.)
- Distribution of solar panels / water heater projects (via NGOs) for informal settlements located on transport corridor

## 5. Budget

- 50,000 $ per community per year
- Eligible costs:
  - Construction
  - Equipment
  - Human resources?
  - Contractors
  - Studies?
  - Supplies
  - Utilities
  - Admin costs?

## 6. Eligibility criteria

- Environmental sustainability
- Financial sustainability?
- Inclusiveness of vulnerable groups
- Cost share?
- Expected outcomes:
  - Creation of job opportunities
  - Improvement of the quality of life
- Timeline? The project should be operational and reach direct beneficiaries within 1 year?

## 7. Reporting requirements

To be determined

## 8. Next steps

- Recruitment of a consultant for the conduction of the Corporate Social Responsibility plan (CSR) and Stakeholder engagement plan (SEP)
- Identification of main target groups including vulnerable and marginalized groups, such as women and refugees (eventually through NGOs)
- Conduction of a need assessment including focus group activities with identified target groups, including vulnerable and marginalized groups such as refugees and women (eventually through NGOs)
- Design of CSR project including:
  - Problem tree
  - Solution tree
  - Logical framework and indicators
  - Risk mitigation framework
  - Detailed timeline
  - Expected number of direct and indirect beneficiaries
  - Detailed budget and spending plan