

# SHOBAK 45MW WIND POWER PROJECT

## NON-TECHNICAL SUMMARY IN ENGLISH



13 September 2017

REV - 5



شركة الشوبك لطاقة الرياح  
AL-SHOBAK WIND ENERGY PSC

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## 1. INTRODUCTION

As part of Jordan’s overall strategy to diversify energy resources and increase the share of renewable energy, a number of renewable energy projects have been proposed by the private sector to the Ministry of Energy and Mineral Resources (MEMR).

Shobak Wind Power Company (hereafter referred to as ‘the Developer’) has been selected by MEMR for the development of a 45 Mega Watt (MW) Wind Power project (hereafter referred to as ‘the Project’) in the Shobak area in Ma’an Governorate. Shobak Wind Power Company is owned by Alcazar Energy (70%) and Hecate (30%).

This document (the Non-Technical Summary (NTS)) provides a summary in non-technical language of the findings contained in the Environmental and Social Impact Assessment (ESIA) Report. The ESIA Report contains more detailed information on the Project and the environmental and social issues considered (refer to Chapter 7 for details on disclosure of the ESIA report). It includes a description of the need for the Project; details of the Project and the main alternatives considered; the assessment of the potential effects from the proposed development upon the environment and community; and details of any required procedures to mitigate significantly adverse environmental effects. It includes an Environmental and Social Management Plan (ESMP) which describes the monitoring and mitigation requirements for the duration of the Project, including responsibilities and any legal requirements. The Developer commits to the ESMP.

A Stakeholder Engagement Plan (SEP) including a stakeholder grievance mechanism has also been developed for the Project, which describes the planned stakeholder consultation activities and engagement process.

### 1.1 Project Alternatives

During the Project’s development, a number of alternatives were identified and analyzed, including Project location, processes, technology and the “no project” alternative:

- MEMR has identified priority areas in Jordan for wind farm development projects. The Developer has considered other potential sites in such priority areas, but based on a due diligence exercise the Shobak area was selected. Such sites were excluded for several technical as well as environmental factors such as proximity to settlements and location in a forest area.
- Several Project design alternatives were also considered, which took into account technical as well as environmental and social considerations (e.g. archaeology and cultural heritage sites).
- The ESIA also investigated solar technology and thermal power plants as technological alternatives to wind power.

## 2. PROJECT DESCRIPTION

The Project is located within Ma’an Governorate in the South of Jordan, approximately 160km south of the capital city Amman. More specifically, the Project site is located within Shobak District which hosts several villages. The closest villages to the Project site include Mdhaibie’ (also known as Al-Faisaliyeh and which is located around 1km to south), Zaitooneh (located 1km to the west), Zobeiriyeh, (located around 1.3km to west) and Shobak (located around 1km to the west). Figure 1 below presents the location of the Project site.

Project site can be accessed through Highway #15 (also known as Desert highway) and which is located 13km east of the Project site. From Highway #15 the Shobak exit leads directly to the Project site.

The Project area is approximately 14.5 km<sup>2</sup> which will be used for the development of the 45 MW Wind Farm Project. The Project will be developed on governmentally-owned lands, and a lease agreement will be signed between the Developer and MEMR/Department of Lands and Survey (DLS).

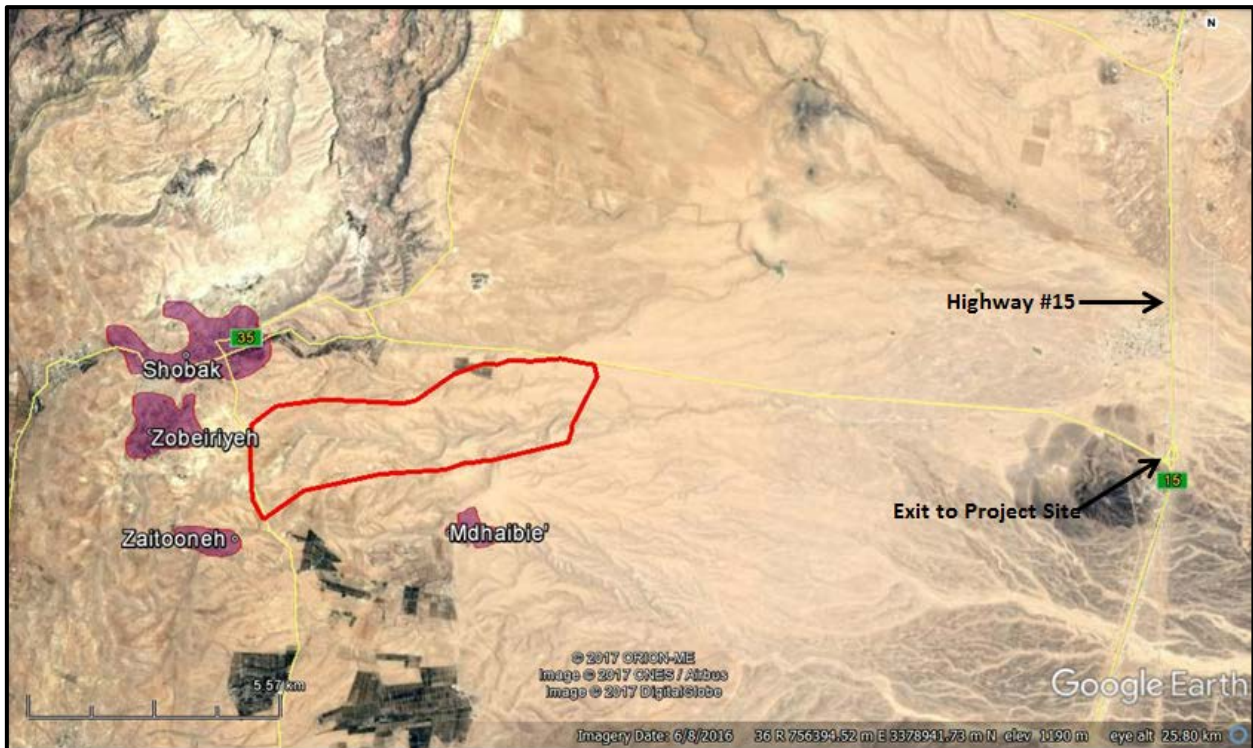


Figure 1: Overview of Project Location

## 2.1 Project Rationale

The Project will result in crucial positive environmental and economic impacts on the strategic and national level given the current challenges the energy sector in Jordan is facing. Such positive impacts underpin rationale for the project:

- The Project allows for more sustainable development and shows the commitment of the Government of Jordan to realizing its Energy Strategy and meeting the set targets for renewable energy sources;
- The Project will contribute to increasing energy security through reliance on an indigenous, inexhaustible and mostly import-independent energy resource. The expected electricity generation from the Project will serve the average annual electricity needs of over 18,000 average local households in Jordan;
- The Project will produce clean energy which will contribute to lowering electricity generation costs when compared to the current costs associated with liquid fuels, and thus leads to a decrease in the Government of Jordan’s fiscal deficit; and
- Generating electricity through wind power is rather pollution-free during operation. Compared with the conventional way of producing electricity in Jordan, the clean energy produced is expected to reduce the consumption of liquid fuels and reduce greenhouse gas emissions and air pollution. The Project will offset more than 100,000 ton of CO<sub>2</sub> per year in Jordan.

## 2.2 Project Components

The key components of the Project are the wind turbines which convert the kinetic energy in wind (i.e. movement of wind) into electricity. A typical wind turbine is shown in Figure 2 below. There will be 13 turbines spread out throughout the Project site. Each turbine will be of 3.45MW capacity with a hub height

of 112 m, rotor diameter of 136 m (or blade length of 68m) and thus a tip height of 180m. Figure 3 below presents the layout of the turbines within the site.

Other buildings and infrastructure required onsite include:

- Crane pad next to each wind turbine to accommodate cranes for the installation of the wind turbines and for maintenance activities during operation;
- Underground cables which will connect the wind turbines with a substation located onsite;
- Substation which will collect electricity generated from the Project and convert the output to a voltage that allows for connection with the High Voltage National Grid;
- Office buildings used for normal daily operational related work;
- A warehouse for storage of equipment and machinery;
- A road network will be required for installation of the turbines during the construction process and for ease of access to the turbines for maintenance purposes during operation; and

The Project will provide approximately 60 jobs during the construction phase. Jobs will include unskilled labour (mainly labour force but will also include a number of security personnel), semi-skilled labour (electricians, welders, fitters, etc.) and skilled labour (engineers, technicians, consultants, surveyors). During operation, the Project will provide approximately 3 jobs, which will include skilled labour (such as engineers) and unskilled labour (such as security personnel, drivers, etc.).

#### Associated Facilities

Connection from the substation located onsite to the national grid will be through a new overhead line (OHL) with a length of approximately 5km. the National Electric Power Company (NEPCO) will be responsible for constructing the OHL and currently an environmental assessment is being undertaken for the OHL route.

### **2.3 Project Phases**

- Planning and Construction Phase (tentatively around May 2018 –October 2019): This includes preparation of a detailed design, planning and transportation of the various components to the site, and onsite preparation and construction activities for installation of the turbines and other components – this will include excavations, grading, and land clearing activities, installation of foundations, erection of turbines and other.
- Operations Phase (2019 – approximately 2039): This phase involves the normal daily operation of the Project and the maintenance of the turbines and all the various electrical equipment.
- Decommissioning Phase (to be determined): After 20 years, the Project will either be decommissioned or MEMR would take ownership and continue operating it. In the case of decommissioning of the Project, decommissioning activities could include the disconnection of the various Project components for final disposal.

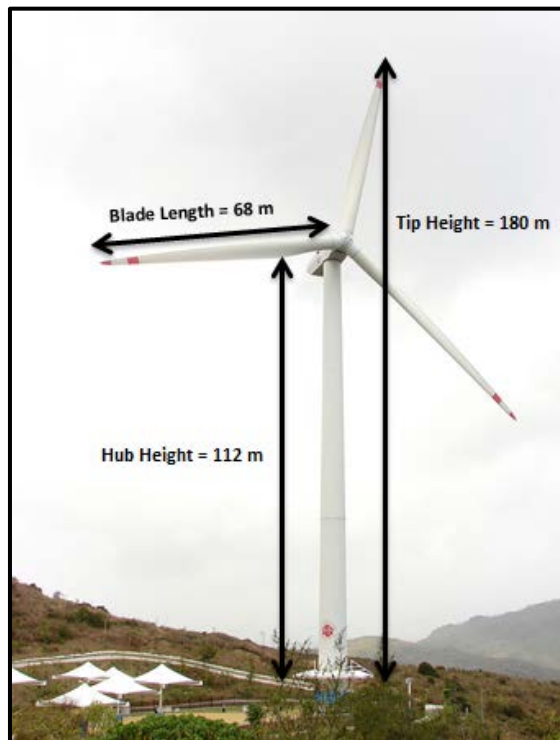


Figure 2: Typical Wind Turbine with 180m Tip Height

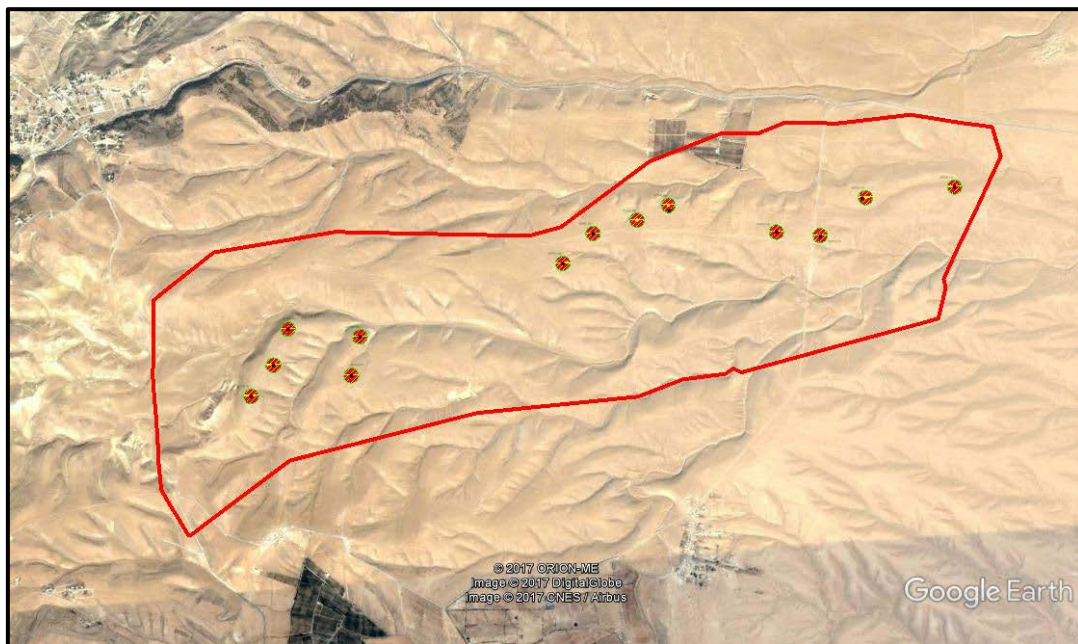


Figure 3: Layout of Project Components within the Project Site

### 3. ESIA PROCESS

The ESIA has been prepared in accordance with the:

- Jordanian environmental clearance process to obtain an environmental permit, and the legal framework including the “Environmental Impact Assessment Regulation No. (37) of 2005”; and
- European Bank for Reconstruction and Development (EBRD) 2014 Environmental and Social Policy which includes a comprehensive set of Performance Requirements (PRs) covering key areas of environmental and social impacts and issues.
- International Finance Corporation (IFC) Environmental & Social Sustainability Performance Standards (IFC, 2012) and IFC applicable Environment, Health, and Safety (EHS) Guidelines.

The process for environmental clearance and obtaining the environmental permit for this Project is stipulated by the “Environmental Protection Law No. (6) of 2017”, “Environmental Impact Assessment Regulation No. (37) of 2005”, and the “Instructions for Site Selection of Development Projects for the year 2016”. This comprises of a number of key steps:

- **Location/Site Approval Permit Application & Decision:** The Developer applies to the MoEnv with the intention to undertake a development project and the MoEnv determines the appropriateness of the site for the proposed development.
- **Screening Decision/EIA Requirement:** As part of the location/site approval permit decision, the MoEnv determines whether or not an ESIA is required of the proposed development project and the nature of this report.

To this extent, the site for the Project has been approved by the MoEnv conditional that a comprehensive ESIA study is undertaken before commencement of any construction or operational activities.

- **EIA Study Phases:** The ESIA comprises of 2 phases:
  - Scoping Phase: This includes the undertaking of a scoping session and submission of a Scoping Report/Terms of Reference (ToR) approved by MoEnv for the study. The scoping session for the Project was held on 10 January 2017 and the Scoping Report/ToR was submitted to the MoEnv and was approved; and
  - Assessment Phase: This includes undertaking the baseline studies, evaluation and assessment of impacts, and the development of an environmental management plan.
  - The assessment phase has been carried out in accordance with the approved ToR by the MoEnv.
- **Approval of EIA:** Upon submission of the ESIA document, the MoEnv reviews the report and either approves the study and grants the environmental clearance and environmental permit for the Project or rejects it. Currently, the ESIA is under review by the MoEnv and an environmental permit is expected in September 2017.

#### 4. SUMMARY OF PAST STAKEHOLDER ENGAGEMENT ACTIVITIES

The table below provides a summary of all stakeholders that were previously consulted and engaged throughout the Project – mainly as part of the ESIA. The table provides a summary of the stakeholder groups that were engaged, date of engagement, and the main objective and outcome.

**Table 1: Summary of Previous Stakeholder Engagement Activities**

Date	Engagement Activity	Summary of Stakeholder Engagement Activities
10 January 2017	Scoping Session	<p>In accordance with the “EIA Regulation No. (37) of 2005”, a scoping session was held for the Project in Amman. The Project was introduced and various components explained. The proposed methodology for the ESIA was outlined and anticipated impacts throughout the Project’s phases were discussed.</p> <p>Stakeholders were identified and invited through formal letters, issued by the Ministry of Environment, to participate in the scoping of environmental impacts into the ESIA. The list of stakeholders was identified by the ESIA Team and the Ministry of Environment. The list of invites mainly included the following stakeholders: (i) national governmental entities (ii) local governmental agencies (iii) non-governmental organizations (iv) academic and research institutions and (v) local community representatives.</p> <p>The main issues raised by stakeholders during the session were related to (i) land use; (ii) birds; (iii) noise; and (iv) occupational health and safety. Such issues are discussed further in Section 6.5.1/Table 13 of the ESIA which also summarizes how such issues were taken into account as part of the ESIA. The ESIA is available on the Developer’s</p>

		website.
10 May 2017	Local Community Consultation Session	<p>A local community consultation session was undertaken with the local community representatives. The meeting was coordinated and headed by the Local Governor of Shobak District.</p> <p>Stakeholders were identified and invited through formal letters issued by Shobak District. The list of invitees mainly included the following stakeholders: (i) members of the Municipal Council which are elected as representatives of the local community (and includes both males and females); (ii) elder representatives of tribal groups; (iii) Community Based Organizations; (iv) local enterprises and businesses; (v) women groups; (vi) local governmental institutions; (vii) youth and the unemployed.</p> <p>Throughout the session, discussions were undertaken about the project, environmental and social impacts, land use patterns in the area, and socio-economic conditions and development. Additional details are provided in 'Section 6.5.2' of the ESIA which is available on the Developer's website.</p>
August 2016 - August 2017	Specialist Consultation	<p>Specialized consultations and engagements have been undertaken as part of the ESIA process with various stakeholder groups to include national and local governmental entities, Non-Governmental Organizations (NGOs), land users and nomads, and other. Such engagements are identified in Section 6.5.3/ Table 14 of the ESIA which is available on the Developer's website.</p>

## 5. SUMMARY OF ENVIRONMENTAL AND SOCIAL BASELINE CONDITIONS & IMPACTS

### 5.1 Introduction

The environmental and social impact assessment (ESIA) comprised of environmental and social baseline studies and an assessment of impacts. Mitigation measures, which are included in the ESMP, were identified for potential significant effects and the significance of residual effects determined. The impact assessment followed an assessment methodology developed to reflect current best practice.

The ESIA has provided the engineers and designers with important information regarding the sensitivities of baseline environmental and social resources that could be affected by the proposed development. The resulting design proposal has been developed to take account of these sensitivities and avoid negative environmental effects wherever possible. The key baseline and impact assessment findings are further discussed below.

### 5.2 Environmental & Social Baseline Conditions & Impacts

#### (i) Landscape and Visual

The proposed wind farm site is located within a moderately hilly terrain area with altitudes ranging from around 1,195m to 1,350m ASL. The project area slopes down to the east and surrounded by mountains, valleys and canyons to the north, west and south west where as to the east hilly terrain and flat planes dominates the landscape. In terms of visual receptors, the main receptors in the area would be the villages surrounding the Project site (to include Mdhaibie', Zaitooneh, Zobeiriyeh, and Shobak) as well as the Shobak Castle which is a touristic attraction in the area (located around 5km form the Project site).

The key anticipated impact from the Project is during the operation phase and which relates to the interaction of the Project with the character of the surrounding landscape and any key visual receptor which might be present.

To study such impacts a visibility analysis was undertaken through a computer software which aims to identify the number of turbines that would be visible from nearby areas and a photomontage simulation which demonstrates how such views would be from critical receptors.



The assessment concludes that the turbines will be visible, particularly from nearby receptors to include the nearby villages and the Shobak Castle – nevertheless no issues of concern are anticipated. As part of consultations with the local communities such visual impacts were explained and no objection or issues of concerns were raised. In addition, turbines will be visible from the Shobak Castle – however from the castle other existing wind farm projects are visible as well as industrial establishments (such as an existing cement factory). Taking the above into account, aesthetic issues are by their nature highly subjective. For some viewers, such turbines could be regarded as manmade structures with visual burdens while to others it represents a positive impact in the sense that they introduce a break in the otherwise dull and monotonous view.

(ii) Land Use

The ESIA team investigated the formal and informal (or ‘actual’) land use of the Project site area as discussed below.

The ESIA team investigated the formal land use planning as set by the various governmental institutions (such as the Ministry of Municipal Affairs, Ministry of Environment, Ministry of Agriculture, etc.) and concluded that there is no conflict with such set land use plans for the area.

The ESIA also investigated the actual land use of the Project site, to determine if it is of any value to local communities and nomadic settlements. The main outcomes are as follows:

- Grazing Activities are undertaken by local communities from March till May within the area including the Project site. This mainly involves day trips to the area where afterwards the local communities return to their villages.
- Harvesting activities (mainly barley) are undertaken by local communities from June till August. Harvesting activities are undertaken in the area in general some of which also takes place within the Project site (although they are governmental owned lands). Throughout this period the local communities undertake their harvesting activities and return to their villages on a daily basis.
- A very limited number of nomadic tribes are known to inhabit the area in general and they move around on a seasonal basis. They move to the area during spring/summer time (between May and September). Throughout this period, they reside in the project area by setting tents in which they live. By the end of September, as the weather becomes colder, they move back to warmer areas. They general occupy the area each year, but do not settle in the exact specific area each year.

Key impacts are related to informal land use as discussed above in which construction and operation activities could limit or affect local community activity and nomadic groups. However, such impacts are minor and not significant mainly due to the fact that the Project components have a very minimal footprint (around 0.65% of entire project site boundary area) and the fact that there is no key habitat that is restricted to the Project site only for agriculture, grazing or nomadic settlers. Such habitats are widespread and can be found extensively throughout the region. In addition, based on a consultation exercises undertaken with local community representatives as well the nomads no objection with regards to such impacts were raised.

The Developer is committed to allowing land users to practice their activities outside of construction and operation areas. In addition, the ESIA identifies requirements for additional consultations and disclosure requirements by the Developer with local communities and nomadic groups on Project development and land uses within the area.

A livelihood restoration framework/plan will be developed to ensure that any negative impacts are fully mitigated.

(iii) Geology and Hydrology

Key impacts related to the Project include potential for flood risks which could affect the Project components. Within the Project site there are a number of wadi systems which are subject to local flood hazards especially during rainy seasons and flash flood events. However, a flood risk assessment has been undertaken which identifies proper mitigations. In particular, the detailed design will avoid sitting any project components (turbines, roads, etc.) within an appropriate buffer distance from the wadi systems to eliminate such risks.

Other potential impacts are mainly from improper housekeeping practices during construction and operation (such as improper management of waste streams – to include solid waste, wastewater and hazardous waste) which could contaminate and pollute soil which in turn could pollute groundwater resources. Nevertheless, the ESIA identifies proper mitigation measures to be taken into account during the construction and operation phase to ensure good housekeeping practices (e.g. proper management of waste streams, proper storage of hazardous materials, etc.).

(iv) Biodiversity

A biodiversity survey was undertaken at the Project site which concludes that it is considered of low ecological significance due to its natural setting; characterized by having low vegetation cover in an arid environment with a low level of diversity. Most recorded species are considered of least concern and common to such habitat areas. However, a plant species was recorded in the Project site with an important status (*Cousinia moabitica*) as well as a faunal species that is likely to exist within the area (Spur-thighed Tortoise).

Key impact is during construction as site preparation activities may disturb existing habitats; however, these impacts are considered to be minor due to the site's low ecological significance. Mitigation measures have been identified, and which mainly require the undertaking of a detailed survey before construction to identify the presence of the Spur-thighed Tortoise and relocating it to outside construction active zones. In addition, another survey must be undertaken before construction to identify the locations of the plant species and ensure they are either marked and/or fenced so that construction activities would avoid them. In addition, the ESIA identifies mitigations to ensure good housekeeping measures to prevent damage to the biodiversity of the site such as prohibiting hunting or collection of species at any time by workers, ensure proper storage and disposal of waste streams, and others.

(v) Birds

A bird baseline survey was undertaken at the Project site over four seasons; autumn, winter, spring and summer which spanned from September 2016 until August 2017. The objective was to observe and record the number and behavior of migratory and resident soaring birds passing through the Project site. A total of 576 monitoring hours were undertaken during the spring and summer season and 468 hours during autumn and winter. The total number of target migratory birds recorded throughout all the surveys is around 3,300.

The assessment concludes that the Project site is not located within an intensive migration route nor within high resident bird activity as explained below. Comparing the results to other areas in Jordan where similar studies were undertaken reveals the following:

- The number of migratory birds recorded is relatively small, especially when compared to other areas that are closer to the rift valley and its margins (the main migration route in Jordan). In such areas, a much higher number and diversity of migratory soaring birds were recorded. As the Project site is located at a distance from the rift valley and its margins it is not considered within an area of intensive passage of migratory birds; and

- Number of resident bird species and their activity in the Project area is much lower when compared to other areas, especially those located closer to Important Bird Areas (IBA) in Jordan. In such areas, a higher number of species and higher activity was recorded especially of those with an important local conservation status.

The key impact on birds is during the operation phase and which is mainly related to risks of strikes and collision on both migratory and resident soaring birds. Such impacts could have crucial effects especially on certain species which have an international and/or local conservation status.

However, to control such impacts the ESIA requires that a birds monitoring plan is implemented during the operation phase of the Project. Monitoring must be undertaken at the Project site year round (but with particular focus during spring and autumn migration seasons) by qualified ornithologists'. The objective of the monitoring is for collision avoidance through observer-led turbine(s) shutdown in situations which pose an imminent risk on a list of key species of concern that has been identified. In addition, the monitoring plan must be complemented with a carcass search plan implemented during operation to demonstrate the effectiveness of the monitoring and allow an estimation of the annual number of bird deaths caused by the turbine. Additional details on the monitoring and carcass search plan is provided in the ESMP.

(vi) Bats

A bat survey was undertaken at the Project site. Bat activity was very low as only 1 species was recorded with minimal activity. This species is considered of least concern and the most common species in Jordan. Such low activity is attributed to the natural characteristics of the Project site being arid with very low vegetation coverage, which do not offer an attractive feeding habitat for bats.

The key impacts on bats are during the operation phase and which are mainly related to risk of bat strikes and collisions with rotors of the operating wind turbines. However, bat activity within the Project site is minimal and therefore such impacts are considered minor and not significant. The ESIA requires that a bats mortality monitoring program be carried out during operation to verify such outcomes.

(vii) Archaeology and Cultural Heritage

An archeology and cultural heritage survey was undertaken for the Project site by the Department of Antiquities (DoA). The survey identified 11 sites which were considered of archeological importance and which are located in the area (7 sites within the Project site and 4 sites outside but nearby). Such sites include features such as watchtowers, remains of pottery pieces, building structures, architectural elements, caverns, etc. which generally date back to the to several periods from the 2<sup>nd</sup> Stone Age till the Roman and Nabatean periods.

Such sites are considered important given their archeological and cultural value however they are not unique or distinctive and most importantly would not affect the Project development. Such sites can be found extensively especially in other mountainous areas in Jordan.

The detailed design prepared has avoided sitting any of the Project components (to include the turbines, roads, substation, warehouses, etc.) within such delineated areas along with an appropriate buffer zone. In addition, during construction, appropriate mitigation measures have been identified which includes for example proper planning of construction activities into/out of the site to avoid those areas, demarcation of the sites, etc. In addition, chance finds procedure will be implemented during construction so that risks to any as yet identified remains are adequately managed.

(viii) Air Quality

Construction activities may produce an increased level of dust and particulate matter emissions, which will temporarily impact ambient air quality. In addition, the use of machinery and equipment are expected to

be a source of some pollutant emissions. Appropriate mitigation measures have been identified for dust and pollution control. This includes for example regular watering of all active construction areas, proper management of stockpiles, regular inspection and maintenance for machinery, and equipment, etc.

(ix) Infrastructure and Utilities

- **Water Supply:** water supply to the Project will be from the Shobak water system through licensed tankers. Water requirements of the Project during construction and operation are minimal and are expected to be easily supplied with no constraints on the existing users.
- **Wastewater, Solid Waste and Hazardous Waste Utilities:** Wastewater from the Project will most likely be disposed at the Shobak or Mansoorah Wastewater Treatment Plant (WWTP) through licensed tankers, while municipal solid waste will be disposed at Shobak Transfer Station, while construction waste at Central Ma'an Landfill. Hazardous waste will likely be disposed at the Swaqa Hazardous Waste Treatment Facility. All such quantities generated during the construction and operation phase are minimal and are expected to be easily handled by the utilities discussed above.
- **Road Networks:** key project components to be transported will include the turbines which will arrive at the Port of Aqaba. A traffic and transport study will be developed by the EPC Contractor to ensure transportation activities are properly and adequately managed. The study will analyse the entire route for transportation of the Project components, will take into account worst case scenarios for transportation of Project components (for blade lengths, tower sections, etc.), and will investigate any constraints which need to be considered along the highways leading to the Project site such as bridges, overhead utility cables, slants in roads, etc. The study will be submitted and implemented in coordination to the relevant authorities.
- **Aviation, Telecommunication and Television and Radio Links:** formal communications were established with the relevant governmental entities responsible for such infrastructure elements – this includes the Civil Aviation Regulatory Commission (CARC), Royal Jordanian Air Force (RJAF), Telecommunication Regulatory Commission (TRC), and Jordan Radio and Television Corporation (JRTV). Most of these entities provided no objection letters on the development of the Project (TRC and JRTV) while the remaining entities are still reviewing the applications and such letters are expected to be issued by September 2017.

(x) Occupational Health and Safety

During the construction and operation phase there will be generic occupational health and safety risks to workers which increase the risk of injury due to accidents. This includes risks from working at heights, electric shocks and burns, moving machinery, etc.

A detailed Occupational Health and Safety Plan (OHSP) for the construction and operation phase will be prepared. The objective is to ensure the health and safety of all personnel in order to maintain a smooth and proper progress of work at the site and prevent accidents.

(xi) Community, Health, Safety and Security

The key impacts anticipated are during the operation phase and which are related to noise and shadow flicker from the operating turbines.

Noise originates from mechanical and aerodynamic effects; where mechanical sound is generated by the machinery and aerodynamic sound emanates from the movement of air around the turbine blades and tower. On the other hand, shadow flicker occurs when the sun passes behind the wind turbine and casts a shadow several hundred meters away from the turbines location. As the rotor blades rotate, shadows pass

over the same point causing an effect known as ‘shadow flicker’. Both impacts could potentially be a source of disturbance and nuisance to the residents of the nearby villages.

To study such impacts, modelling software was used to predict the sound propagation from the Project’s wind turbines and expected level of shadow flicker on the nearby villages of Mdhaibie’, Zaitooneh, Zobeiriyeh and Shobak (refer to Figure 1 earlier).

With regards to noise, the model took into account most adverse/worst-case assumptions. Results were then compared with the most stringent noise limits which are the Jordanian “Instruction for Reduction and Prevention of Noise for 2003” which requires a maximum allowable limit of noise levels in villages of 50dBA and 40dBA during daytime and night time respectively. Due to the distance between the turbine and nearby villages, results of the modeling indicate that the maximum allowable limits for noise identified within the Instruction would not be exceeded in any of the nearby villages and therefore no issues of concern are anticipated.

As for shadow flicker, the model also took into account the most adverse/worst-case assumptions. Results were then compared to international best practice requirements (which recommend that shadow flicker effects not exceed 30 hours per year and 30 minutes per day). Due to the distance between the turbine and nearby villages, the results indicate that limits would not be exceeded in any of the nearby villages and therefore no issues of concern are anticipated.

Although there are no issues of concern as explained above, the ESIA requires additional requirements to ensure the above – such as a noise monitoring program during operation to verify the outcomes and results of the noise assessment.

Other impacts on community health and safety include impacts from public access to Project components, impacts from blade/ice throws from turbines, tower glints, low frequency noise, and other. However, those are assessed to not be significant and appropriate mitigation and monitoring measures have been identified in the ESIA to control such impacts.

(xii) Socio-economic Issues

The Developer is committed to social responsibly and local community engagement and development. The Project will create around 60 job opportunities during the construction phase and around 3 job opportunities during the operation phase. The Developer is aiming to hire local community members to the greatest extent possible. In addition, the Developer is committed to other social responsibility programs towards the local community. This, to some extent, could contribute to enhancing the living environment for its inhabitants and elevate their standards of living.

The ESIA has provided recommendations to the Developer which aim to enhance such positive impacts. The ESIA recommends that the Developer adopt and implement a community integration plan for working with the local community members. The Plan should at a minimum consider the following:

- Manage expectations so that local communities are realistic about opportunities from the Project and clearly identify commitments by Developer related to social development;
- Identify the number of skilled and unskilled job opportunities targeted to the local community throughout the construction and operation phases. The developers are expected to provide in detail the qualifications and skills required and constraints of local community members and to which extent those could be addressed through capacity building;
- Present transparent recruitment procedures for the local community. Such procedures must provide equal opportunities for all, including females;
- Detail additional areas where local community members can be involved besides job opportunities provided they have the required skills and expertise (e.g. appointment of local contractors); and

- Ensure timely and continuous communication and dissemination of information between the developers and the local community members.
- Consider allocating funds for social responsibility programs to be implemented for the local communities through a structured approach and based on the needs of these communities.

(xiii) Cumulative Impacts

The ESIA also investigated cumulative impacts which could result from incremental impacts from other known existing and/or planned developments in the area based on currently available information. Based on that, the only relevant development projects which could result in cumulative impacts included several existing and/or planned wind farm projects in the area.

The key relevant cumulative impact would be on biodiversity, bats and avi-fauna. Nevertheless, proper management measures have been identified to ensure that such wind farm projects would work collectively to avoid such impacts.

## **6. ENVIRONMENTAL & SOCIAL MANAGEMENT & MONITORING**

The ESIA contains an outline plan for managing and monitoring the environmental and social impacts during construction, operation and decommissioning of the Project. Monitoring will form an important part of the implementation and operation of the project. In accordance with the “EIA Regulation No. (37) of 2005”, the Regulator (being MoEnv), will be responsible for undertaking compliance monitoring to ensure that the responsible entity is adhering to the ESMP requirements.

During both construction and operation, certain activities, indicators and environmental and social receptors will be monitored such as birds, biodiversity, archaeology, etc. Monitoring may include observation and recording, or may include data gathering and sampling. Monitoring reports will be required during the construction and operational phases. The monitoring results will be useful for assessing the long term cumulative effects, if any. If ongoing problems occur, adaptive mitigation measures can be developed and implemented. In addition, the Developer will be disclosing to the local communities a summary of the monitoring results throughout the Project duration to include semi-annually during the construction phase and annually during the operation phase.

## **7. FURTHER INFORMATION & CONTACT DETAILS**

Full project preparation documents, including the ESIA (its respective annexes, including the ESMP) and the NTS and SEP are available on the Developer website (<http://alcazarenergy.com/our-projects/>). In addition, hard copies are available at the following entities:

### **1. Ministry of Environment**

Location: Amman – Um Uthaina – King Faisal bin Abdul Aziz Street – Building No. 83  
P.O. Box: 1408  
Postal Code: 11941  
City: Amman  
Phone: 962 6 5560113  
Fax: 962 6 5560288  
Email address: [info@moenv.gov.jo](mailto:info@moenv.gov.jo)

### **2. Shobak Municipality**

Location: Shobak – Najjal Main Road  
Tel: (962) 3 2164973  
Fax: (962) 3 2164973

**3. Shobak District office**

Location: Shobak – Najjal Main Road

Tel: (962) 3 2164052

Fax: 03- 2164107

**4. Shobak Wind Energy Local Office in Shobak**

Community Liaison Officer – Alcazar Energy

Ret. Col. Mr. Khalil Odeh Al Hawartheh

Telephone: +962772151728