

Environmental & Social Impact Assessment (ESIA)

**SUEZ Wind Energy BOO Wind Power Plant
1.1 GW – SWE North (PLOT 2)**

17 July 2024

DRAFT

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EcoConServ
ENVIRONMENTAL SOLUTIONS



ECO
Consult

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RCREEE

Regional Center for Renewable Energy and Energy Efficiency
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LIST OF ABBREVIATIONS

AfDB	African Development Bank
BMP	Biodiversity Management Plan
BOO	Build, Own and Operate
CEA	Cumulative Effect Assessment
CEP	Community Engagement Plan
CHA	Critical Habitat Assessment
CO₂	Carbon Dioxide
CSR	Corporate Social Responsibility
E&S	Environmental and Social
EBRD	European Bank for Reconstruction and Development
EEAA	Egyptian Environmental Affairs Agency
EETC	Egyptian Electricity Transmission Company
EIA	Environmental Impact Assessment
EPC	Engineering, Procurement, and Construction
ESAP	Environmental and Social Action Plan
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
ESMS	Environmental and Social Management System
GDP	Gross Domestic Product
GHG	Greenhouse Gases
GoE	Government of Egypt
GoS	Gulf of Suez
GW	Gigawatt
H&S	Health and Safety
HR	Human Resources
IBA	Important Bird Area
IFC	International Finance Corporation
ISES	Integrated Sustainable Energy Strategy
IUCN	International Union for Conservation of Nature
KBA	Key Biodiversity Area
KPI	Key Performance Indicator
MoM	Minutes of Meeting
MSDS	Material Safety Data Sheet
MW	Megawatt
NG	Net Gain
NGOs	Non-Governmental Organizations
NNL	No Net Loss
NREA	New and Renewable Energy Authority
NTS	Non-Technical Summary
OHSP	Occupational Health and Safety Plan
OHTL	Overhead Transmission Line
OSHA	Occupational Safety and Health Administration

PPE	Personal Protective Equipment
RCREEE	Regional Center for Renewable Energy and Energy Efficiency
SCA	Supreme Council of Antiquities
SEA	Sexual Exploitation and Abuse
SEAH	Sexual Exploitation And Harassment
SEP	Stakeholder Engagement Plan
TSP	Total Suspended Particulate
WWTP	Wastewater Treatment Plant

1. INTRODUCTION

The Project is located within the Gulf of Suez (GoS) around 290 km southeast of the capital city of Cairo. The total area of the Project site is 50 km².

Administratively, the Red Sea Governorate is divided into 7 Cities (also known as Districts), each headed by a Local City Council. The capital of the Governorate is Hurghada that is located around 91 km south of the Project site.

The Project is located within the Ras Gharib District and therefore administratively is under the Ras Gharib City Council. The Ras Gharib District is further divided into Ras Gharib city and two (2) rural (village) local units: Zaafarana and Wadi Dara. The closest community settlement to the Project site is Wadi Dara Village (located 0.9 km to the west).

Generating electricity through wind power is rather pollution-free during operation. Compared with the current conventional way of producing electricity in Egypt through thermal power, the clean energy produced from renewable energy resources is expected to reduce consumption of fossil fuels, and is to aid in reducing GHG emissions, as well as air pollutant emissions. The Project is to displace around 1.4 million metric tons of CO₂ annually.

The Project footprint (i.e. the area of disturbance), based on the Project's components, is significantly small, calculated at approximately 4.3 % of the total boundary of the Project area.

Table 1: Footprint of the Project Components

Component	Footprint	Description
Turbines	0.31km ²	Typically, each crane pad is around 4,000m ² in area, whereas each foundation typically consists of a circular footing of maximum 25m diameter with a maximum of 74 turbines.
Substation and Warehouse and Storage facilities	0.07km ²	Typically, footprint for substation and building facilities is around 0.05km ² .
Trenches for MV cables and communication cables	0.9km ²	This includes trenches with a calculated length of around 95.80 km and a width of 1m.
Road networks	0.9km ²	This includes the road network with a total length of 26.29 km and a width of 6m.
Total Project Footprint	2.18km ²	
Total Project site Boundary Area	50 km ²	Project footprint is approximately 4.3% of the total boundary of the Project area.

The table below provides a summary of the key Project components, along with a detailed description of each of those components to follow. It is important to note that the selection of wind turbines depend on a feasibility study as well as a technical and economical evaluation undertaken by the Developer.

Table 2: Summary of Key Project Components

Component	Description
Project Generation Capacity (MW)	550 MW

Technology Type	Envision
Number of Wind Turbines	69
Rated Power per Turbine (MW)	8.0 MW
Rotor Diameter (m)	171 m
Hub Height (m)	100 m
Infrastructure and Utilities	This includes: (i) internal road network; (ii) underground MV cables; (iii) warehouse and offices; (iii) substation; and (iv) associated facilities such as the high voltage overhead transmission line.

The energy sector is a key driver for the socio-economic development of Egypt, representing around 13% of current GDP and thus making economic growth in the country contingent upon the security and stability of energy supply. To align and reinforce the sector with sustainable development, the Arab Republic of Egypt (through the Ministry of Electricity and Renewable Energy) had developed and adopted the Integrated Sustainable Energy Strategy (ISES) 2015 – 2035, which provides an ambitious plan to increase the contribution of renewable energy to 42% of the country's electricity mix by 2030, of which wind power is a key component, to be developed mostly in the Gulf of Suez (GoS) due to the wind characteristics in the area.

As a result, the GoE issued the Renewable Energy Law (Decree Law 203/2014) to support the creation of a favourable economic environment for a significant increase in renewable energy investment in the country and establishes the legal basis for the Build, Own and Operate (BOO) framework. Through the BOO mechanism, the Egyptian Electricity Transmission Company (EETC) invites private investors to submit their offers for solar and wind development projects, for specific capacities and the award is to be made to that bidder with the lowest Kilowatt Hour (kWh) price. In addition, the GoE (through the New and Renewable Energy Authority (NREA)) provides the land for the investors.

In accordance with the Law above, a consortium composed of ACWA Power and Hassan Allam Utilities B.V (hereafter referred to as 'the Developer') is proceeding with developing a new wind power plant project (Suez

Wind Energy – (SWE)) with a capacity of 1,100MW under the BOO scheme. SWE is to be developed over two (2) Plots – the first located within the northern parts of the Gulf of Suez (hereafter referred to as 'Plot 1') and the second located within the southern parts of the Gulf of Suez - Plot 2.

The Regional Centre for Renewable Energy and Energy Efficiency (RCREEE) is managing the Environmental and Social (E&S) process for the Project development on behalf of the Developer. RCREEE commissioned the consortium consisting of EcoConServ, ECO Consult and Safe Soar (hereafter referred to as 'the ESIA Consultant') to carry out an Environmental and Social Impact Assessment (ESIA) for the Project.

As noted earlier, the above 1,100MW Project will be developed over two (2) plots. Given the geographical distance between the plots, from an environmental and social perspective, separate ESIA studies will be undertaken for each plot. This report represents the ESIA for Plot 2 / SWE North.

2. PROJECT DESCRIPTION

2.1.1 Project Setting

The Project is located in the Red Sea Governorate of Egypt, around 290 km to the southeast of the capital city of Cairo. More specifically, the Project is located near the Red Sea shoreline and within the Ras Gharib District of the Red Sea Governorate, where the closest residential areas include Wadi Dara Village (located 0.9 km to the west) refer to the figures below.

The Project is located within the NREA Concessionary Area, a 656 km² for which an Environmental Social and Impact Assessment was undertaken in 2007 to determine the potential environmental impacts of wind power development. The NREA Concessionary Area is to host the development of wind power amounting to 3,000 MW. The corresponding EIA informing the NREA Concessionary Area on impacts of wind turbine development identifies site-specific environmental and social constraints to be taken into account by the Project developer throughout the planning and design phase of the Project in accordance with the three 'zones' of the NREA Concessionary Area and aligned with anticipated environmental impact among competing environmental interests: renewable energy development and conservation, particularly avi-fauna populations. The area starts about 20 km in the south of Ras Gharib and reaching up to the Gulf of Zayt (about 60 km in the North of Hurghada). The wind power target capacity for the area is between 2,000 – 3,000 MW by 2026/2027.



Figure 1: Project Site in Relation to the Capital City of Egypt



Figure 2: Project Site and Closest Villages



Figure 3: NREA Concessionary Area's 3 Zones with the Project site overlain in Zone 2

The Project site is located within the Ras Gharib City (or District) and therefore administratively is under the Ras Gharib City Council. The Ras Gharib District is further divided into Ras Gharib town as well as 2 rural (village) local units (Zaafarana and Wadi Dara). The closest community settlement to the Project site

is Ras Gharib city (located 37.7 km to the northeast).

Ras Gharib City is the second-largest city in the Red Sea Governorate, and the most important Egyptian city in terms of oil production.

Table 3: Project Site Coordinates

Project Boundary Coordinates		
Point	Latitude	Longitude
1	28.052828°	33.252076°
2	28.050188°	33.276469°
3	28.003485°	33.316218°
4	27.991080°	33.338052°
5	27.984591°	33.341722°
6	27.975285°	33.250200°
7	27.998702°	33.241345°
8	28.000215°	33.230187°

2.1.2 Project Components

Wind turbine technology relies on harvesting the kinetic energy in wind (i.e. movement of wind) and turning it into mechanical energy which in turn is used for electricity generation. The key components of the Project include the following:

- Wind Turbines: a typical wind turbine is presented in the figure below. For this Project there are to be 69 wind turbines occupying the project site for a capacity of 8.0 MW, respectively. The turbines under either possibility will have a hub height of 100 m and a rotor diameter of 171 m, respectively.
- Supporting infrastructure and utility elements for the Project which will include:
 - Cables that will connect the turbines to an onsite substation
 - Substation that converts the output from the turbines to a voltage that is appropriate for connection with the National Grid
 - Onsite building infrastructure that will include an administrative building (offices) and a warehouse for storage of equipment and machinery
 - Road network for ease of access of various project components throughout the site
- Associated facilities which will mainly include an Overhead Transmission Line (OHTL) that will connect from the substation onsite to the National Grid.

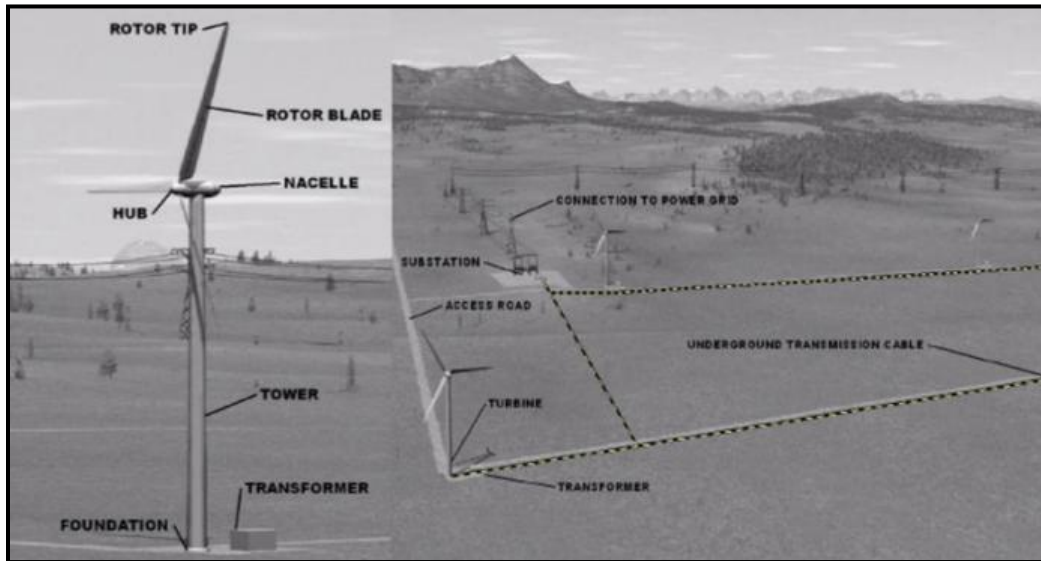


Figure 4: (a) Typical Structural Components of a Wind Turbine, (b) Typical Components of a Wind Farm

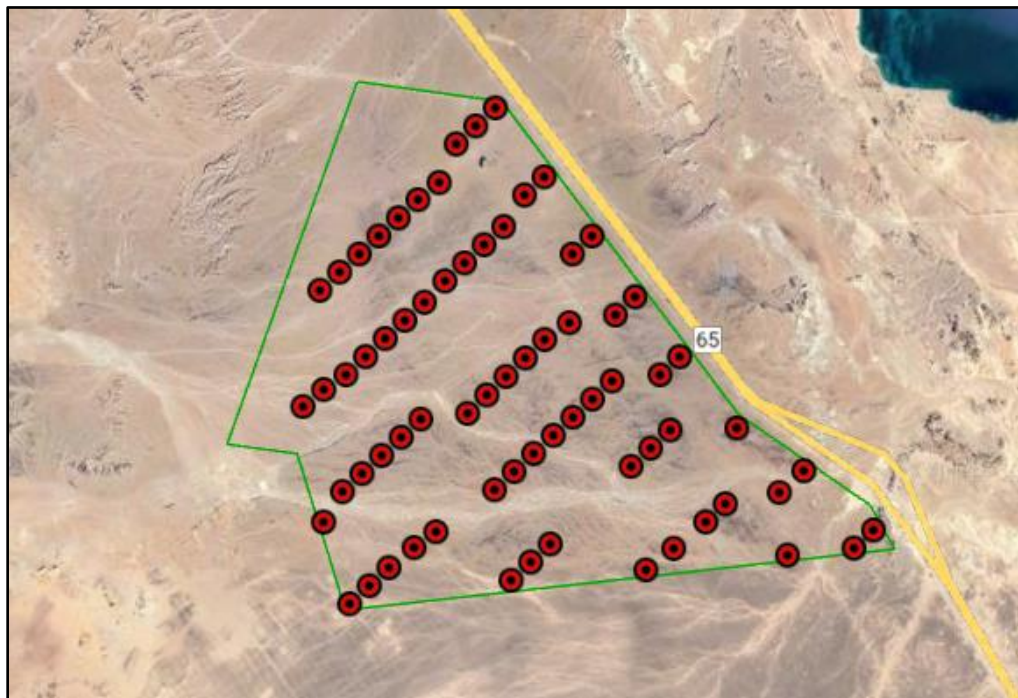


Figure 5: Project Site Turbine Layout

2.1.3 Project Phases

The Project will include 3 distinctive phases as follows:

- Design and Construction Phase that will include: (i) preparation of the detailed design, (ii) transportation of components to the site, (iii) site preparation activities (land clearing, excavations, etc.), and (iv) installation of components.
- Operation Phase that will include the normal daily operation of the wind farm and the undertaking of maintenance activities as required.

- **Decommissioning Phase** that will include the dismantling of the various Project components at the end of the life time.

According to the current timeline, construction of the Project is anticipated to commence approximately Q4 of 2024 and will require approximately 24 months for construction and commissioning (i.e. Q3 of 2026). Operation of the Project is therefore anticipated to commence in late 2026 (Q4) for a period of 25 years.

3. SUMMARY OF ENVIRONMENTAL AND SOCIAL BASELINE CONDITIONS & IMPACTS

3.1 Introduction

The Environmental and Social Impact Assessment (ESIA) comprised 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 key baseline and impact assessment findings are further discussed below.

3.2 Stakeholder Consultations

As part of the scoping process of the Project, targeted consultations were undertaken with key stakeholders that are relevant to the Project to include but not limited to: central governmental entities; local governmental entities; key Non-Governmental Organizations (NGOs); and local community representatives. Throughout the consultations, a handout (in Arabic language) was prepared and distributed to such stakeholder groups with key information to include but not limited to rationale for Project, Project location and setting, key components and activities of the Project and other as applicable.

The table below is a condensed breakdown of the stakeholder categories that were engaged in this process.

Table 4: Summary of Consultations

Stakeholder	Number	
	Males	Females
Ministry of Tourism and Archaeology, Red Sea Archaeology and Heritage Institute	2	
Nature Conservation Egypt (NCE)	1	-
Egyptian Environmental Affairs Agency EEAA	1	-
Egyptian Electricity Transmission Company EETC	-	4
EEAA Red Sea Branch	1	-
State property Department in the Red Sea Governorate	1	-
Ras Gharib City Council	1	-
local unit of Wadi Dara village	5	-
Red Sea Water and Wastewater Company	1	-
Department of Planning and Projects in the Red Sea Governorate	-	1
General Petroleum Company	1	-
General Administration of Ground Water in Red Sea	-	1
Etisalat Misr	2	-
Orange company		
Radio and Television Unit in Ras Ghareb and the Red Sea Governorate	4	-

Stakeholder	Number	
	Males	Females
Bedouin families in Ras Gharib	12	-
Total	32	6

3.3 Environmental & Social Baseline Conditions & Impacts

3.3.1 Landscape and Visual

Visual impacts associated with wind energy projects typically concern the turbines themselves (e.g. colour, height, and number of turbines) and impacts relating to their interaction with the character of the surrounding landscape and the visual receptor which might be present.

Turbines are tall structures (185 for this Project) that can be seen from several kilometres away and impose a change on the landscape of the area where they are installed. However, visual impacts depend on several factors such as distance, size, visibility, landscape and geography, and the presence of potential sensitive visual receptors.

Nevertheless, visual impacts created from the development of the Project are not considered an issue of concern due to the following:

Potential sensitive receptors are located in Wadi Dara Village - 0.9km from the Project. However, Wadi Dara Village does not have a large permanent community with majority of population being workers and guards employed at the various poultry, livestock and agricultural farms within the settlement (mainly at a rotational basis). Based on this, aesthetical value for such a receptor loses some importance. Finally, based on consultations undertaken with Wadi Dara such impacts were explained but no issues were raised.

The rotating blades will be visible from vehicles passing across the Hurghada - Cairo Highway as well as the main road leading into Wadi Dara Village which also intersects the Project Site. The turbines can attract visual attention and potentially distract drivers passing along the highway.

Project area is considered a barren and desert area and in general is located within an industrial area with petroleum activities for which its aesthetical value loses some importance.

There are several existing and under construction wind farm developments in the area as well as several electricity distribution and transmission lines so the addition of this Project will not be a significant impact to the visual and landscape characteristics of the area.

Potential Impacts Overview: Construction Phase

- Site preparation activities include land clearing, leveling, excavation, and grading.
- Construction activities create temporary negative visual effects, especially near sensitive receptors like Wadi Dara Village.
- Visual impacts are noticeable during construction due to machinery and equipment.
- Impact magnitude is medium, considering the presence of sensitive receptors.
- Impact sensitivity is moderate due to the proximity of sensitive receptors.

Mitigation Measures: Construction Phase (in brief)

- Implement general housekeeping measures to maintain site orderliness.
- Remove unused machinery and equipment to reduce visual impacts.
- Ensure proper waste collection and disposal.
- Implement restoration measures post-construction.

Monitoring and Reporting Requirements:

- Conduct daily or monthly inspections to maintain site cleanliness.

Potential Impacts during the Operation Phase:

- Visual impacts from turbines include changes to landscape aesthetics.
- Turbines are visible from several kilometers away.
- Potential visual distraction for drivers passing by on highways.
- Impact magnitude is medium due to the visibility of project elements.
- Impact sensitivity is moderate considering key visual receptors.

Mitigation Measures: Operation Phase (in brief):

- Install clear and informative signage on highways to alert drivers and provide guidance.

Monitoring and Reporting Requirements:

- Inspect highways to ensure signage installation.

3.3.2 Land Use & Infrastructure

As mentioned earlier, the Project site is located within the NREA Concession Area, an area that is overall carved into three zones (Zones 1 – 3) prescribing varying restrictions and or recommendations on development. The Project site lies within Zone 2 within which require ornithological monitoring and verification prior to permitting wind farm development.



Figure 6: NREA Concessionary Area's 3 Zones with the Project site overlain in Zone 2

The Project site is also adjacent to Wadi Dara Village, entailing several receptors that are also near the project site with part-time residence (with one abandoned receptor recorded in the Project site and is to be removed). The land use survey identified characteristics of land use in Wadi Dara Village which namely includes agricultural activities (businesses) and part-time residences.

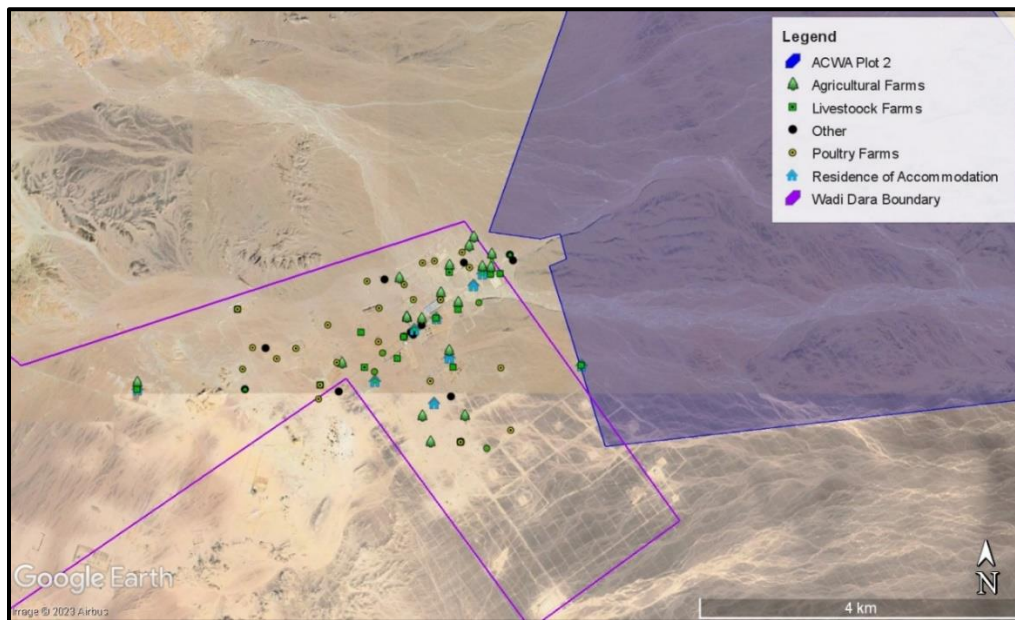


Figure 7: Land Use Survey for Wadi Dara

Additionally, the Wadi Dara Cooperative Association for Agricultural Remediation, which manages agricultural development and, in recent years, has implemented an activity to allocate lands to private sector investors. It was found that 0.1 km² of the NREA Concession area and Project site had been allocated under the Wadi Dara Cooperative's program. Following consultations, the area was ceded back to NREA and alternative lands, located on the western-side of Wadi Dara Village, of similar composition land has been allocated to the Cooperative by the Red Sea Governorate.

Within the Project site, there are indications of limited development including the landscaping (on the lands that were being managed by the Cooperative) and a former dumpsite, which at the time of the land-use survey, had indications of use such as recently disposed chicken carcasses. It's since been affirmed that the dumpsite is officially in disuse.

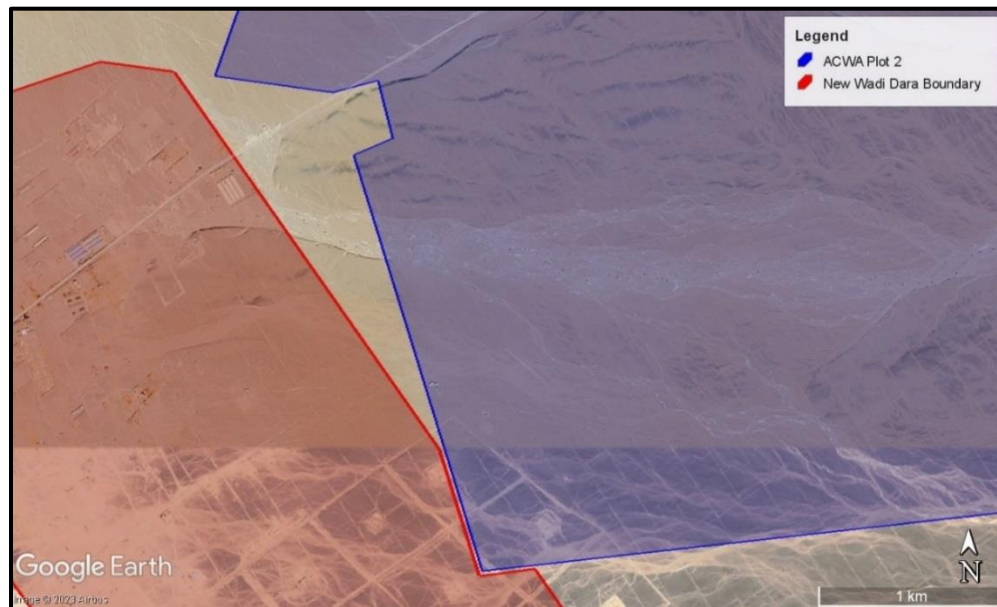


Figure 8: New Wadi Dara Boundary and Project Site

Gebel El Zeit is designated as both an IBA and a KBA (with concurrent boundaries) and the project area lies within the protected site. The site consists of a narrow, 100km long strip extending along the Gulf of Suez and Red Sea Coast.

A detailed land use survey was undertaken for the Project site to understand any informal land use activities undertaken such as physical activities (houses, structures, etc.) or economical activities (such as grazing, agricultural, etc.). It is important to note that area of the Project site is under the “Ghafra System” of Bedouin Groups (although they have no physical or economical activities within the site), which entails involving such Bedouin groups in the Project (through jobs, services, etc.) for their support. In particular, the key Bedouin Groups known in the area are the Tabbna and the Hamadin families. As per consultations, the ESIA team confirmed that there are no stable Bedouin communities in nor near the Project site (neither temporary nor permanent).

Potential Impacts Overview:

- The Project site overlaps with an area previously utilized by the Wadi Dara Cooperative Association and private investors.
- Formal objections and acknowledgments regarding land use need to be addressed.
- Failure to address land use issues could lead to long-term negative impacts and potential conflicts with Bedouin Groups and private investors.
- Impact significance is moderate due to potential disputes and impacts on land use, yet, as mentioned above, were addressed through the reallocation of lands to the Cooperative by the Red Sea Governorate.

- Consequential impacts of the dumpsite, located centrally within the Project site, if its contents were to remain on site in attracting birds

Mitigation Measures (in brief):

- Obtain formal approval from the Red Sea Governorate for removal of structures.
- Conduct formal consultations with private investors through the Wadi Dara Association.
- Coordinate with Bedouin Groups for employment and procurement opportunities.
- Implement a Social and Environmental Plan (SEP) focusing on Bedouin engagement and community development.
- Initiate community development programs outlined in the Community Engagement Plan (CEP) and Corporate Social Responsibility (CSR) program.

Monitoring and Reporting Requirements:

- Submit formal approval from the Red Sea Governorate.
- Submit final detailed designs or proof of consultation with investors.
- Monitor effectiveness of grievance mechanisms for the Bedouin community.
- Provide documentation of employment and procurement procedures including references for Bedouin groups.
- Submit evidence of coordination and agreement with Bedouin groups as part of the SEP.

3.3.3 Hydrology and Hydrogeology (Soil and Groundwater)

The project site is located in an area of wadi deposits, surrounded by local moderately to low productive aquifers with insignificant surface and limited sub-surface recharges. Surface water hydrology in the area of the project concerned mainly about the accumulation of rainwater in the watershed areas of dray wadies and the nature of flow along the main streams of them.

The height of the of the terrace above the ground level (the level of the following terrace) varies from 0.5 m to about 2 m at the west while it varies from 1 m to about 3 m at the west and southwest. This terrace composed of very coarse chert nodules, cobbles and boulders of granite, basalt, impeded in fine clay and sand. These wadi elevations.

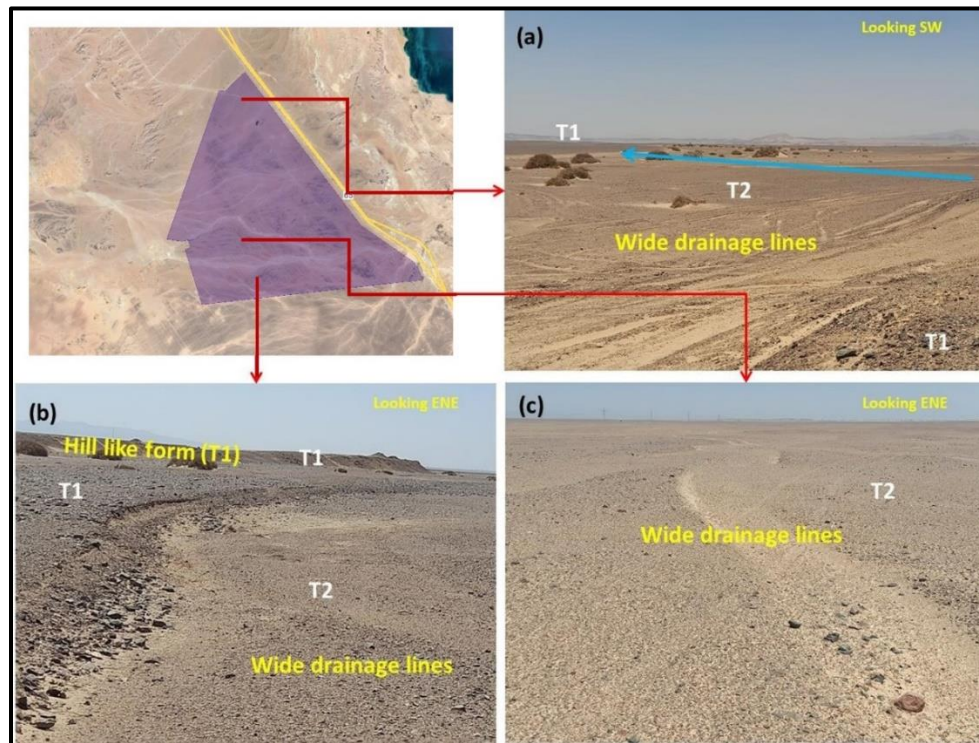


Figure 9: Field photographs of the terraces T1, T2. Note the shallow and very wide drainage lines crossing the T1 and floored by T2 (b) and the hill like form of T2 (b).

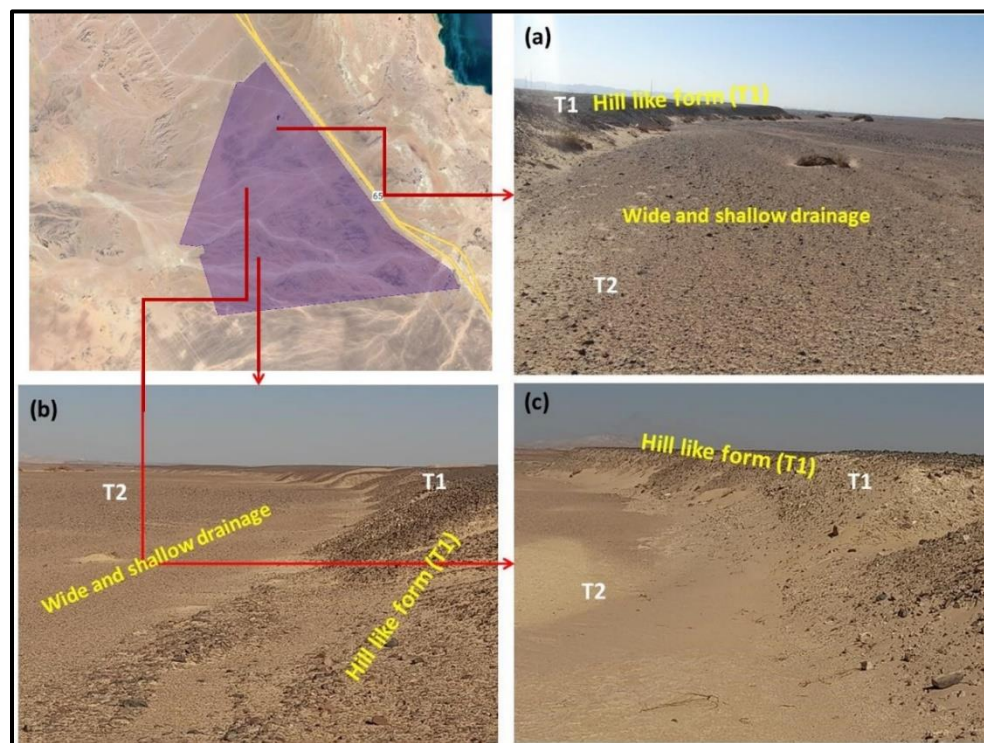


Figure 10: Drainage lines in the wadi (changes in elevation) T1 (ranging between 0.5m – 2 m from the wadi floor), T2 0.5m and lower with elevation generally decreasing from west to east toward the GoS

Pumped and observation wells were drilled by Desert Research Institute within the Wadi Dara area south of the project site (Sewidan et al., 1991), in addition to the wells drilled by RIGW, 2005, are the main source of the groundwater information in the study area as shown the figure below.

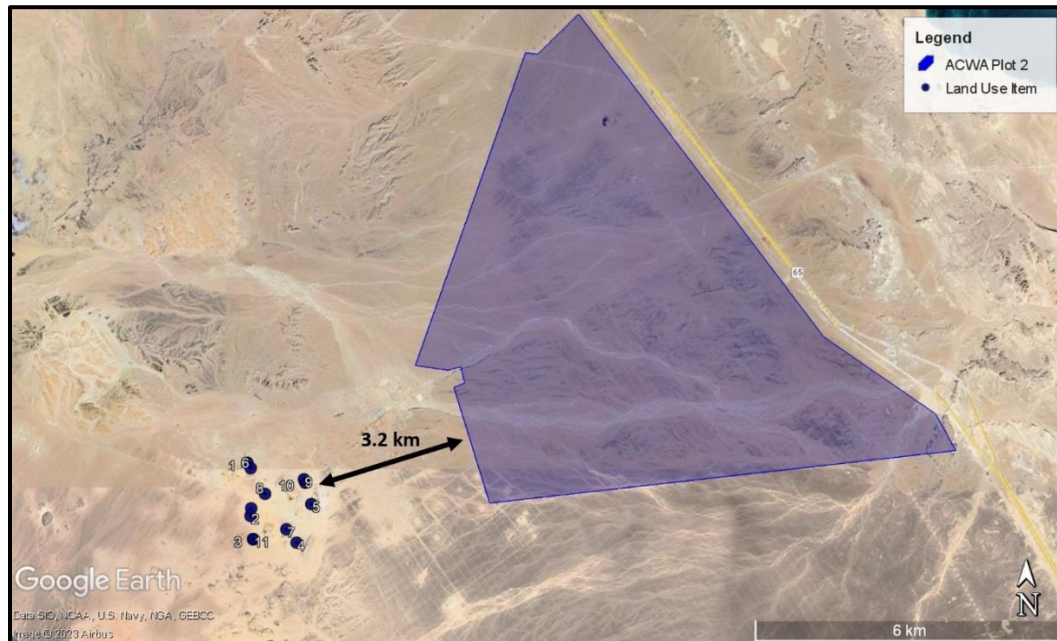


Figure 11: Location Map of the Drilled Wells at Wadi Dara

Potential Impacts Overview:

- Flood Risks
 - Local flood hazards during rainy seasons could damage Project components.
 - Failure to consider flood risks may result in infrastructure damage, health, and safety impacts.
 - Impact significance is moderate due to potential damages and risks.
- Improper Waste Management
 - Local flood hazards during rainy seasons could damage Project components.
 - Failure to consider flood risks may result in infrastructure damage, health, and safety impacts.
 - Impact significance is moderate due to potential damages and risks.
- Erosion and Runoff
 - Local flood hazards during rainy seasons could damage Project components.
 - Failure to consider flood risks may result in infrastructure damage, health, and safety impacts.
 - Impact significance is moderate due to potential damages and risks.

Mitigation Measures (in Brief):

- Undertake a flood risk assessment for the project site, incorporating simulated models based on climate satellite images, rainfall data, and digital elevation models.
- Conduct site visits to verify study results and model designs.
- Consider climate change impacts and risks in the assessment.

Potential Impacts from Improper Management of Waste Streams during Construction and Operation:

Potential Impact Overview:

- Improper management of waste streams could contaminate soil, pollute groundwater, and pose risks to workers' health and safety.
- Impacts can be controlled through best practice housekeeping measures during both construction and operation phases.

Mitigation Measures (in brief):

- Implement proper sorting, storage, and disposal of waste streams, distinguishing between solid non-hazardous and hazardous wastes.
- Coordinate waste collection and disposal with relevant authorities and contractors.
- Prohibit illegal disposal of waste to the land and ensure adherence to waste hierarchy principles.

Monitoring and Reporting Requirements:

- Regularly inspect waste management practices onsite.
- Review records and manifests for consistency in waste volume data.
- Provide regular environmental reports on waste management practices.

Additional Mitigation Measures for Specific Waste Streams:

Solid Waste Generation:

- Sort and store waste according to categories.
- Coordinate waste collection with the municipality or waste contractor.
- Prohibit fly-dumping and distribute litter bins appropriately.

Wastewater Generation:

- Coordinate wastewater collection with relevant authorities or contractors.

- Prohibit illegal disposal of wastewater and ensure proper maintenance of septic tanks.

Hazardous Waste Generation:

- Coordinate hazardous waste collection and disposal with licensed contractors.
- Ensure proper storage and labeling of hazardous waste.
- Prohibit illegal disposal and maintain records of hazardous waste management.

Hazardous Material:

- Store hazardous materials properly and maintain a register of their usage.
- Incorporate measures to prevent spills and leakage during handling and storage.
- Respond promptly to spills and report measures taken to minimize impacts.

Potential Impacts from Erosion and Runoff during the Construction Phase:

Potential Impacts Overview:

- Construction activities could increase erosion and runoff, leading to siltation of surface water.
- Adequate control measures are necessary to minimize these impacts.

Mitigation Measures:

- Avoid excavation works during aggressive weather conditions.
- Implement erosion control barriers and clear markers around the work site.
- Restore disturbed surfaces to their original condition as much as possible.

Monitoring and Reporting Requirements:

- Regularly inspect erosion and runoff control measures onsite.
- Conduct inspections to ensure implementation of mitigation measures.

3.3.4 Biodiversity

The biodiversity baseline assessment concludes that the Project site in general is barren and of low ecological significance and sensitivity. The assessment identified several flora, fauna and avi-fauna species within the Project site most of which are considered of least concern and common to such area habitats. There are no sensitive habitats recorded within the Project site.

Indications of animals of special conservation interest (identified as IUCN Vulnerable species) were observed including for the Spiny-tailed Lizard, the Red Fox and the Lesser Egyptian Gerbil (IUCN Least

Concern species).

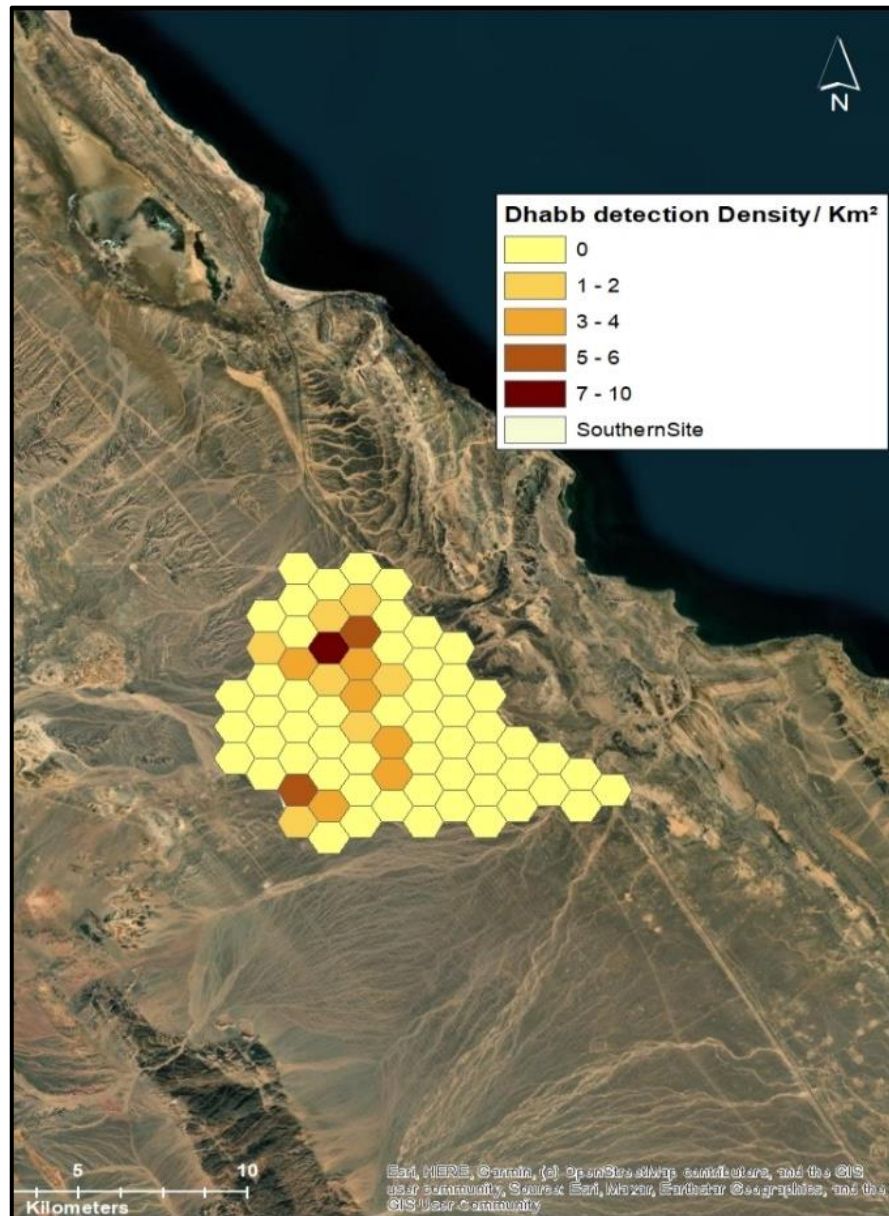


Figure 12: Spiny Tailed Lizard Density

The main impacts on biodiversity are mainly from improper conduct, traffic control and housekeeping practices by workers (i.e. hunting of animals, discharge of hazardous waste to land, etc.) during the construction and operation phase throughout the site to safeguard flora and fauna. The ESIA has identified adequate mitigation measures which aim to control such impacts and ensure proper conduct and

housekeeping practices are implemented. With the implementation of such measures the impact is considered potentially significant.

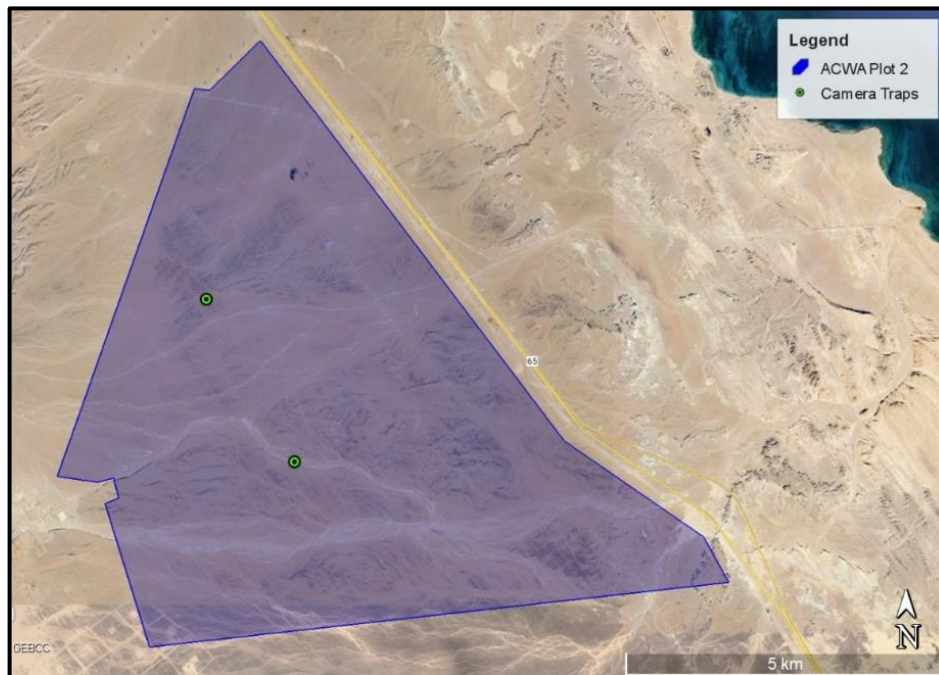


Figure 13: Location of Red Fox recordings during site surveys

Potential Impacts Overview:

Habitat Loss, Fragmentation, and Degradation:

- Direct loss of natural habitats will occur due to site clearance and construction activities, impacting terrestrial fauna.
- Despite habitat loss, mitigation measures include enhancing around 2.0 km² of habitat using native planting in suitable areas within the project site to ensure no net loss of habitat.
- Infrastructure layout details are not finalized, but efforts will be made to minimize habitat loss.

Direct Impacts on Sensitive Receptors (Flora and Non-native Species):

- Imported non-native flora could establish and out-compete native species, leading to significant long-term impacts.
- Mitigation measures include conducting botanical surveys, avoiding areas with non-native species, mechanical control, and using local soil to prevent importing non-native species.

Direct Impacts on Sensitive Receptors (Vertebrates - Site Clearance and Earthworks):

- Construction activities will negatively impact sensitive vertebrate species, especially the Egyptian Spiny Tailed Lizard.
- Mitigation measures include pre-construction surveys, avoiding areas with nesting birds, and translocating lizards if necessary.

Direct Impacts on Sensitive Receptors (Vertebrates - Vehicle Collisions):

- Vehicle collisions pose a risk to vertebrates, with mitigation measures such as enforcing speed limits, installing signage, and regular checks for carcasses.

Direct and Indirect Impacts on Sensitive Receptors (Poaching, Collection, etc.):

- Poaching and disturbance of flora and fauna are possible, with strict controls and enforcement measures in place.

Direct and Indirect Impacts on Sensitive Receptors (Disturbance, Reduced Air Quality, Noise, Lighting, Littering, Waste Management, Pest Species):

- Various impacts including disturbance, reduced air quality, noise, lighting, littering, and pest species are addressed with mitigation measures such as induction training, regular monitoring, waste management plans, and pest control measures.

Mitigation Measures (in brief):**Habitat Loss, Fragmentation, and Degradation:**

- Enhance around 2.0 km² of habitat using native planting to offset habitat loss.
- Minimize habitat loss associated with infrastructure by selecting suitable areas.

Direct Impacts on Sensitive Receptors (Flora and Non-native Species):

- Conduct botanical surveys before construction.
- Avoid areas with non-native species and use local soil to prevent importing them.
- Implement mechanical control and mapping of non-native species.

Direct Impacts on Sensitive Receptors (Vertebrates - Site Clearance and Earthworks):

- Conduct pre-construction surveys and avoid areas with nesting birds.
- Translocate sensitive species if necessary, with detailed protocols for capture and release.

Direct Impacts on Sensitive Receptors (Vertebrates - Vehicle Collisions):

- Enforce speed limits and install signage.
- Regular checks for carcasses and removal to reduce scavenging risks.

Direct and Indirect Impacts on Sensitive Receptors (Poaching, Collection, etc.):

- Enforce strict controls on poaching and disturbance.
- Implement a chance find procedure and sanctions for breaches.

Direct and Indirect Impacts on Sensitive Receptors (Disturbance, Reduced Air Quality, Noise, Lighting, Littering, Waste Management, Pest Species):

- Include biodiversity training in site induction.
- Monitor and manage disturbance, air quality, noise, and lighting.
- Implement waste management plans and pest control measures.

Monitoring and Reporting Requirements:

Habitat Loss, Fragmentation, and Degradation:

- Conduct regular assessments of planted habitat areas to ensure establishment and success.
- Monitor habitat connectivity and species movement through the area.
- Habitat and Flora monitoring within the area of influence to measure the success of habitat rehabilitation work to reasonably demonstrate no net loss of Natural Habitat as well as to record the presence of invasive / non-native flora. Monitoring will be completed in years 1, 2, 5, 10 and 15 including full-site walkover surveys as well as quadrat surveys will be completed.
- Monitoring of mammal and herpetofauna assemblages across the area of influence. Repeat of baseline surveys will be completed in years 1, 2, 5, 10 and 15. Population densities recorded in Year 5 will be compared to baseline levels and if required additional work will be completed.

Direct Impacts on Sensitive Receptors (Flora and Non-native Species):

- Conduct periodic botanical surveys to track the presence of non-native species.
- Monitor the effectiveness of mechanical control measures and mapping.

Direct Impacts on Sensitive Receptors (Vertebrates - Site Clearance and Earthworks):

- Conduct regular surveys for nesting birds and sensitive species.
- Monitor the success of translocation efforts and document any mortalities.

Direct Impacts on Sensitive Receptors (Vertebrates - Vehicle Collisions):

- Implement regular checks for carcasses and record any incidents.
- Monitor compliance with speed limits and signage.

Direct and Indirect Impacts on Sensitive Receptors (Poaching, Collection, etc.):

- Implement a reporting system for wildlife sightings and disturbance incidents.
- Monitor compliance with anti-poaching measures and enforcement actions.

Direct and Indirect Impacts on Sensitive Receptors (Disturbance, Reduced Air Quality, Noise, Lighting, Littering, Waste Management, Pest Species):

- Conduct regular assessments of noise levels and air quality.
- Monitor waste management practices and pest control measures.
- Document any instances of littering and take corrective actions.

Monitoring will be carried out by qualified ecologists and environmental consultants, with data recorded and analyzed regularly to ensure that mitigation measures are effective in minimizing impacts on biodiversity. Any deviations or issues identified during monitoring will trigger corrective actions to address them promptly and ensure compliance with environmental standards.

Potential Impacts Overview:

Habitat Loss, Fragmentation, and Degradation:

- Direct loss of natural habitats will occur due to site clearance and construction activities, impacting terrestrial fauna.
- Despite habitat loss, mitigation measures include enhancing around 2.0 km² of habitat using native planting in suitable areas within the project site to ensure no net loss of habitat.
- Infrastructure layout details are not finalized, but efforts will be made to minimize habitat loss.

Direct Impacts on Sensitive Receptors (Flora and Non-native Species):

- Imported non-native flora could establish and out-compete native species, leading to significant long-term impacts.
- Mitigation measures include conducting botanical surveys, avoiding areas with non-native species, mechanical control, and using local soil to prevent importing non-native species.

Direct Impacts on Sensitive Receptors (Vertebrates - Site Clearance and Earthworks):

- Construction activities will negatively impact sensitive vertebrate species, especially the Egyptian Spiny Tailed Lizard.
- Mitigation measures include pre-construction surveys, avoiding areas with nesting birds, and translocating lizards if necessary.

Direct Impacts on Sensitive Receptors (Vertebrates - Vehicle Collisions):

- Vehicle collisions pose a risk to vertebrates, with mitigation measures such as enforcing speed limits, installing signage, and regular checks for carcasses.

Direct and Indirect Impacts on Sensitive Receptors (Poaching, Collection, etc.):

- Poaching and disturbance of flora and fauna are possible, with strict controls and enforcement measures in place.

Direct and Indirect Impacts on Sensitive Receptors (Disturbance, Reduced Air Quality, Noise, Lighting, Littering, Waste Management, Pest Species):

- Various impacts including disturbance, reduced air quality, noise, lighting, littering, and pest species are addressed with mitigation measures such as induction training, regular monitoring, waste management plans, and pest control measures.

Mitigation Measures (in brief):

Habitat Loss, Fragmentation, and Degradation:

- Enhance around 2.0 km² of habitat using native planting to offset habitat loss.
- Minimize habitat loss associated with infrastructure by selecting suitable areas.

Direct Impacts on Sensitive Receptors (Flora and Non-native Species):

- Conduct botanical surveys before construction.
- Avoid areas with non-native species and use local soil to prevent importing them.
- Implement mechanical control and mapping of non-native species.

Direct Impacts on Sensitive Receptors (Vertebrates - Site Clearance and Earthworks):

- Conduct pre-construction surveys and avoid areas with nesting birds.
- Translocate sensitive species if necessary, with detailed protocols for capture and release.

Direct Impacts on Sensitive Receptors (Vertebrates - Vehicle Collisions):

- Enforce speed limits and install signage.
- Regular checks for carcasses and removal to reduce scavenging risks.

Direct and Indirect Impacts on Sensitive Receptors (Poaching, Collection, etc.):

- Enforce strict controls on poaching and disturbance.
- Implement a chance find procedure and sanctions for breaches.

Direct and Indirect Impacts on Sensitive Receptors (Disturbance, Reduced Air Quality, Noise, Lighting, Littering, Waste Management, Pest Species):

- Include biodiversity training in site induction.

- Monitor and manage disturbance, air quality, noise, and lighting.
- Implement waste management plans and pest control measures.

Monitoring and Reporting Requirements:**Habitat Loss, Fragmentation, and Degradation:**

- Conduct regular assessments of planted habitat areas to ensure establishment and success.
- Monitor habitat connectivity and species movement through the area.
- Habitat and Flora monitoring within the area of influence to measure the success of habitat rehabilitation work to reasonably demonstrate no net loss of Natural Habitat as well as to record the presence of invasive / non-native flora. Monitoring will be completed in years 1, 2, 5, 10 and 15 including full-site walkover surveys as well as quadrat surveys will be completed.
- Monitoring of mammal and herpetofauna assemblages across the area of influence. Repeat of baseline surveys will be completed in years 1, 2, 5, 10 and 15. Population densities recorded in Year 5 will be compared to baseline levels and if required additional work will be completed.

Direct Impacts on Sensitive Receptors (Flora and Non-native Species):

- Conduct periodic botanical surveys to track the presence of non-native species.
- Monitor the effectiveness of mechanical control measures and mapping.

Direct Impacts on Sensitive Receptors (Vertebrates - Site Clearance and Earthworks):

- Conduct regular surveys for nesting birds and sensitive species.
- Monitor the success of translocation efforts and document any mortalities.

Direct Impacts on Sensitive Receptors (Vertebrates - Vehicle Collisions):

- Implement regular checks for carcasses and record any incidents.
- Monitor compliance with speed limits and signage.

Direct and Indirect Impacts on Sensitive Receptors (Poaching, Collection, etc.):

- Implement a reporting system for wildlife sightings and disturbance incidents.
- Monitor compliance with anti-poaching measures and enforcement actions.

Direct and Indirect Impacts on Sensitive Receptors (Disturbance, Reduced Air Quality, Noise, Lighting, Littering, Waste Management, Pest Species):

- Conduct regular assessments of noise levels and air quality.
- Monitor waste management practices and pest control measures.

- Document any instances of littering and take corrective actions.

Monitoring will be carried out by qualified ecologists and environmental consultants, with data recorded and analyzed regularly to ensure that mitigation measures are effective in minimizing impacts on biodiversity. Any deviations or issues identified during monitoring will trigger corrective actions to address them promptly and ensure compliance with environmental standards.

3.3.5 Bats

The presents of bats was evaluated using a nocturnal acoustic survey and a manual search of possible roosting sites across and within the near proximity of the Project area. Eight (8) acoustic detectors were utilized across 24 locations that were aligned with intended wind turbine locations.. Based on the literature review, several bat species of ‘least concern’ (IUCN Red List of Threatened Species) could be present in the area; however, the Project site is characterized by low vegetation coverage and limited habitat.

There was a single observation recorded during the entirety of the sixty-night acoustic survey.

Potential Impacts Overview:

- Key impacts anticipated on bats is during the operation phase and mainly related to risk of bat strikes and collisions with rotors of the operating wind turbines. Such impacts are anticipated to be not significant due to low activity excepted as roosting sites for bats were not observed on the Project site.

Mitigation Measures:

- Implement adaptive monitoring during post construction – fatality monitoring in accordance with international best practices

Monitoring Requirements:

- Post construction fatality monitoring around wind turbines

3.3.6 Archaeology and Cultural Heritage

An archaeological baseline survey has been carried for the Project site which concluded the absence of records of any sites of interests or significance within the Project area. Therefore, there are no anticipated impacts.

The main potential impact could occur during the construction phase from site preparation activities if a possible site of archeological remains is uncovered. Improper management (if such sites are discovered) could potentially disturb or damage such sites. Nevertheless, the ESIA requires the implementation of chance find procedures if such remains in the ground be discovered throughout the construction phase. With the implementation of such measures the impact is considered not significant.

Potential Impacts Overview:

- Site preparation activities, including land clearing, excavation, grading, etc., may disturb archaeological remains if improperly managed.
- Chance of discovering buried archaeological sites during construction activities.
- Potential negative impacts include disturbance or damage to discovered archaeological sites, with medium magnitude and low sensitivity.

Mitigation Measures (in brief):

- Notify the Supreme Council of Antiquities (SCA) during excavation activities to oversee and prevent disturbance of underground archaeological remains.
- Implement chance find procedures if archaeological remains are discovered, including halting construction, fencing the area, and notifying the Ministry of Tourism and Antiquities/Red Sea and Suez Antiquities Inspection Office.
- Resume construction activities only after clearance from the Ministry/Inspection Office, with no work allowed in the discovered area.

Monitoring Requirements:

- Submit formal communication with SCA regarding excavation activities.
- Monitor and report actions taken in case of new archaeological discoveries, including fencing, limiting site access, and notifying the Ministry of Tourism and Antiquities/Red Sea and Suez Antiquities Inspection Office. Prepare and submit a detailed report to the Ministry in such cases.

Note: There are no anticipated impacts during the operational phase of the project.

3.3.7 Air Quality and Noise

An air quality and noise baseline was undertaken for the Project area at three monitoring points for a period of 24 hours. The baseline concluded that pollutant levels for all parameters measured are significantly lower than the maximum allowable ambient air levels indicated within the legal limits. Similarly for noise, the results were within national limits for both day and night-time.

No key source of noise emission or activity were noted throughout the monitoring period. Therefore, the exceedance of noise levels is mainly attributed due to the intensity and speed of the wind at the measurement sites, despite efforts to mitigate the effect of wind speed on measurements.

Construction and operation activities of wind power project are passive in nature and do not result in any key air emissions or significant noise sources. However, construction activities may increase level of dust and particulate matter emissions, which will temporarily impact ambient air quality due to the use of heavy machinery contributing to both noise levels and dust.

Potential Impacts Overview:

- Anticipated impacts on air quality and noise during both construction and operation phases of the wind farm.
- Construction phase activities expected to increase dust and pollutant emissions, as well as noise levels, temporarily.
- Potential health and nuisance effects on onsite workers and nearby receptors.
- Operation phase impacts primarily related to noise generated by wind turbines

Mitigation Measures:

- Identification and control of excessive dust and pollutant emissions from construction activities.
- Provision of Personal Protective Equipment (PPE) for workers exposed to high dust and noise levels.
- Implementation of dust control measures like regular watering of roads, proper stockpile management, and covering of trucks transporting materials.
- Inspection and maintenance program for vehicles and equipment to minimize unnecessary emissions.
- Identification and mitigation of excessive noise levels through source control and general noise suppression measures.

Monitoring and Reporting Requirements:

- Dust and noise monitoring on a quarterly basis at key construction points, including Total Suspended Particulates (TSP), PM10, PM2.5, and noise levels.
- Periodic inspections at nearby sites to assess dust and noise impacts from construction activities.
- Reporting of excessive pollutant/dust or noise levels and measures taken to mitigate impacts.

3.3.8 Infrastructures and Utilities

Various items of infrastructure are found in and in the proximity of the Project site. Within the Project site is the decommissioned dumpsite, which in recent years had been subject to informal dumping, receiving animal carcasses from the nearby Wadi Dara Village.

Adjacent to the Project site's eastern border is Cairo-Hurghada Highway, from which the main, paved road leading to Wadi Dara Village intersects the Project site. A smaller dirt road also intersects the Project site.

There is a water desalination plant and a wastewater treatment plant, both of which are located north of the Project site along the Cairo-Hurghada Highway, located at distances 3 km and 9.1 km, respectively. Military units are located at distances 34 km and more from the Project site's northern border. Several communications towers also line the highway, two of which are adjacent to the Project site's eastern side. With the GoS being a hub of petroleum production, active petroleum activities are located along the coast, opposite the project site, and areas of former excavation activities (excavated and leveled land) north of

the Project site within 4.4 km.

Servicing electricity transmission is the overhead transmission line (OHTL) that transects through the Project site's eastern side, leading to the wind farms of NREA Concessionary Area's Zone 3's wind farm projects.

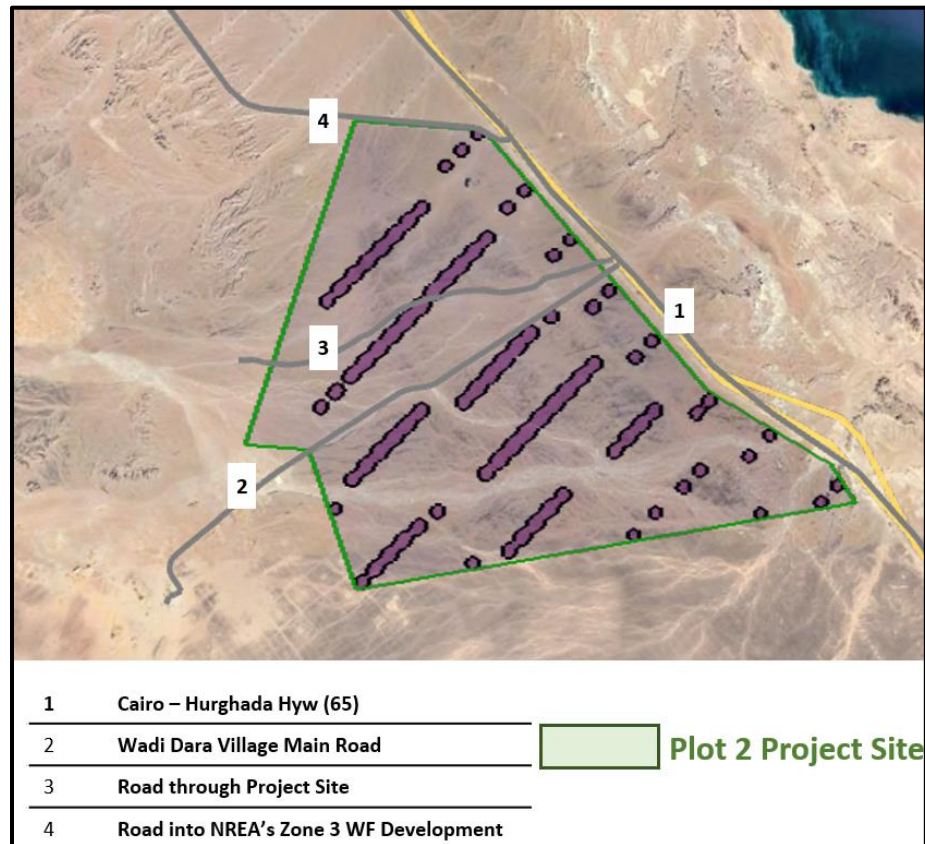


Figure 14: Vehicular Infrastructure



Figure 15: Decommissioned dumpsite located within Plot 2

Potential Impacts Overview:

Existing Roads and Networks:

- Highways and roads traverse the project site, facilitating access but potentially increasing traffic and associated risks.

Water Management:

- Wadi Dara Village lacks connection to the National Water Network, relying on water truck delivery.
- Groundwater salinity poses challenges for irrigation.
- Limited wastewater treatment facilities in the vicinity.

Waste Management:

- Observations of litter and active dumping within the project site.
- Limited solid waste disposal facilities in the region.
- No sewage network in Wadi Dara Village.

Civil and Military Radars and Aviation Infrastructure:

- Military units exist nearby, potentially affecting project operations.
- Communication towers and radio infrastructure could influence project activities.

Petroleum Facilities:

- Proximity to petroleum units and excavation areas may pose safety and environmental risks.

High Voltage Power Line:

- Overhead transmission line crosses the project site, raising concerns about electromagnetic fields.

Other Wind Farms:

- Presence of operating and planned wind farms in the region may impact project development and operations.

Mitigation Measures:

Baseline Assessment Methodology:

- Regular monitoring and management of dumpsite to prevent unauthorized waste disposal.

Existing Roads and Networks:

- Implement traffic management measures to minimize congestion and accidents.

Water Management:

- Explore options for improving water access and quality in Wadi Dara Village.
- Consider alternative irrigation methods to mitigate groundwater salinity issues.

Waste Management:

- Establish proper waste disposal practices and facilities within the project site.
- Coordinate with local authorities for waste management solutions.

Civil and Military Radars and Aviation Infrastructure:

- Coordinate with military units to minimize potential conflicts with project activities.
- Ensure compatibility of project operations with communication infrastructure.

Petroleum Facilities:

- Coordinate with petroleum companies to mitigate safety and environmental risks.
- Implement measures to prevent contamination from nearby petroleum activities.

High Voltage Power Line:

- Implement measures to minimize electromagnetic field exposure near the power line.

Other Wind Farms:

- Collaborate with other wind farm operators to address shared challenges and opportunities.

Monitoring and Reporting Requirements:

Baseline Assessment Methodology:

- Regular monitoring and management of dumpsite to prevent unauthorized waste disposal.
- Implement measures to discourage informal dumping and enforce waste management regulations.

Existing Roads and Networks:

- Implement traffic management measures to minimize congestion and accidents, such as speed limits and signage.
- Conduct regular maintenance of roads to ensure safety and accessibility.

Water Management:

- Explore options for improving water access and quality in Wadi Dara Village, such as establishing water treatment facilities.
- Implement water conservation measures to mitigate groundwater salinity issues, such as drip irrigation systems.

Waste Management:

- Establish proper waste disposal practices and facilities within the project site, including designated landfill areas.
- Coordinate with local authorities for waste management solutions, such as recycling programs and community clean-up initiatives.

Civil and Military Radars and Aviation Infrastructure:

- Coordinate with military units to minimize potential conflicts with project activities, such as adjusting construction schedules to avoid interference with military operations.
- Ensure compatibility of project operations with communication infrastructure, such as installing shielding to reduce electromagnetic interference.

Petroleum Facilities:

- Coordinate with petroleum companies to mitigate safety and environmental risks, such as implementing spill prevention measures and emergency response protocols.
- Implement measures to prevent contamination from nearby petroleum activities, such as installing barriers and monitoring groundwater quality.

High Voltage Power Line:

- Implement measures to minimize electromagnetic field exposure near the power line, such as adjusting turbine placement and installing shielding.
- Conduct regular inspections and maintenance of the power line to ensure safety and reliability.

Other Wind Farms:

- Collaborate with other wind farm operators to address shared challenges and opportunities, such as coordinating construction activities to minimize environmental impacts.
- Share best practices and lessons learned to optimize wind farm operations and maximize benefits for the community.

3.3.9 Socio-economic Conditions

The main impact anticipated on socio-economic conditions is related to potential job opportunities for local communities from the Project during construction and operation. However, such impacts are limited taking into account the nature of activities. No details are available at this stage on the number of job opportunities targeted to local communities, type of jobs, duration, etc; however, as many as 750 job opportunities are to be required during construction and 20 positions during operational phase.

Taking the above into account, the Project is committed to ensuring that priority for job opportunities are targeted for local community members to the greatest extent possible throughout the construction and operation phase for skilled and unskilled jobs.

At a later stage, a local recruitment procedure will be developed by the Contractors and Operator, under supervision from the Project. The procedure will identify the number of job opportunities targeted for local communities and recruitment process will be undertaken through the Governorate's Labor Office. Based on that, the recruitment procedure will also include a selection process that is fair, transparent and provides equal opportunities for all including females.

In addition, the Project will also implement a Social Responsibility Program that will be implemented for the local communities based on their needs and requirements.

Potential Impacts Overview:**Construction Phase:**

- Creation of around 750 job opportunities, including skilled and unskilled positions, for approximately 24 months.
- Potential engagement of local communities in procurement opportunities along different segments of the value chain.

Operation Phase:

- Creation of around 20 job opportunities, including skilled and unskilled positions, for a duration of 25 years.
- Indirect positive benefits to the local community from increased demand for local services, supplies, and businesses.

Overall:

- Positive impact on socio-economic development through job creation and procurement opportunities.
- Contribution to enhancing the living environment for local inhabitants.
- Acknowledgement of the need for collective and coordinated actions beyond the project to promote socio-economic development in the area.

Mitigations (in brief):**Local Recruitment Procedure:**

- Develop a procedure to identify job opportunities targeted for local communities, ensuring fairness, transparency, and equal opportunities for all.
- Prioritize employment of local communities, including Bedouin groups, in skilled and unskilled positions.
- Explore collaboration with other wind farm developers in the area to maximize employment opportunities for the community.

Local Procurement Procedure:

- Develop a procedure to identify procurement opportunities targeted for local communities, ensuring fairness, transparency, and equal opportunities for all.
- Prioritize procurement from local suppliers, subcontractors, and service providers, including Bedouin groups.
- Explore collaboration with other wind farm developers in the area to maximize procurement opportunities for the community.

Social Responsibility Program:

- Implement a structured social responsibility program to benefit local communities based on priority development projects identified through needs assessment.
- Prioritize projects for local communities based on available budget, vision, timeline for implementation, and other factors to maximize positive impact.

Note: As the impacts discussed are mainly positive, no specific mitigation measures are identified. The focus is on enhancing positive impacts through recommended actions.

3.3.10 Occupational Health and Safety and Worker Accommodation

During the construction and operation phase there will be occupational health and safety risks to workers, such as working on construction sites, exposure electric shock hazards during maintenance activities,

working at heights, etc. The ESIA requires that the Contractor and Operator prepare an Occupational Health and Safety Plan (OHSP) tailored to the Project's site and activities. Such plans aim to ensure the health and safety of all personnel in order to concur and maintain a smooth and proper progress of work at the site and prevent accident which may injure personnel. With the implementation of such measures the impact is considered not significant.

In addition, the Contractors will prepare a worker accommodation plan, which will define the minimum health and safety standards and principles for worker accommodation and ensure impacts on community health and safety from worker influx are managed and controlled. This could include impacts related to pressure on infrastructure, services and utilities, introduction of new reservoirs of diseases, inappropriate code of conduct by workers towards local communities, possible increase in social vices, and other.

Potential Impacts Overview:

- Occupational health and safety risks include slips and falls, working at heights, working with tools, struck-by objects, moving machinery, working in confined spaces, exposure to chemicals, high temperatures, electric shocks, and risks from nearby operations like oil rigs.
- Risks considered of short-term duration during construction and long-term duration during operation, with potential for medium magnitude and high sensitivity leading to permanent impacts in extreme cases.
- Impacts are generally controlled through the implementation of best practices.

Mitigation Measures:

Occupational Health and Safety Plan (OHSP):

- Develop OHSP tailored to construction and operation phases, compliant with national and international requirements, addressing roles and responsibilities, risk assessment, training, PPE, COVID-19 protocols, venomous species onsite, and incident procedures.

Emergency Preparedness and Response Plan:

- Establish organizational and operational measures for emergencies, including emergency responder team, drills, procedures for first actions, site evacuation, communication, control measures for various emergencies, real-time communication, assembly points, and roles/responsibilities.

Worker Grievance Mechanism:

- Develop a comprehensive procedure to register, document, resolve, and close out worker complaints, allowing grievances through various channels, ensuring timely handling and close-out reports.

Worker Accommodation:

- If onsite accommodation provided, ensure compliance with national and international standards, including living facilities, medical facilities, and management.

Monitoring and Reporting Requirements:

Inspection and Reporting:

- Regular inspection to ensure OHSP implementation and compliance, reporting on health and safety performance, accidents/incidents/emergencies, measures taken, and accommodation compliance.

Submission of Plans:

- Submission of Emergency Preparedness and Response plan and Worker Grievance Mechanism.

3.3.11 Community Health, Safety, and Security

During construction and operation phase the main impacts on community health, safety and security include the noise, shadow flicker, trespassing by unauthorized personnel, and potential occurrence of incidences between site personnel and communities. These potential impacts are outlined below, accompanied by mitigation and monitoring measures in brief (full elaboration included in the ESIA).

Potential Impacts Overview:

Wind turbines produce noise and cast shadows (known as shadow flicker) during operation. As the rotor blades rotate, shadows pass over the same point causing an effect known as ‘shadow flicker’. Both noise and shadow flicker could be a source of nuisances and disturbances. However, within the Project site and surrounding there are no sensitive receptors that could be affected by such impacts and therefore this is considered irrelevant.

Potential Impacts from Noise – Wind Turbine Operation

- Wind turbines produce noise from mechanical and aerodynamic sources, potentially affecting nearby receptors.
- Preliminary modelling indicates noise levels within acceptable limits but detailed assessment ongoing.

Potential Impacts from Shadow Flicker – Wind Turbine Operation

- Shadow flicker from wind turbines could cause nuisance and disturbance to nearby residents.
- Detailed assessment underway to identify potential effects on Wadi Dara Village.

Potential Impacts from Trespassing of Unauthorized Personnel:

- Unauthorized access to Project components could pose safety hazards and public safety concerns.
- Impact considered of moderate significance, mainly during operation phase.

Worker Influx During Construction:

- Impact considered of minor significance, mainly during construction phase.
- Inappropriate management of security issues and incidents by security personnel towards local communities could result in resentment, distrust and escalation of events.
- Influx of workers may introduce health risks, social issues and vices including inappropriate code of conduct (sexual exploitation and harassment (SEAH))

Security Personnel Management:

- Inappropriate management by security personnel could lead to resentment and distrust.
- Impact considered of minor significance, during both construction and operation phases.

Blade and Tower Glint:

- Reflection of sunlight off rotor blades or tower could impact nearby residences.
- Impact considered not significant due to absence of sensitive receptors and temporary nature of effect.

Blade/Ice Throws:

- Potential for blade or ice throws from turbines, with extremely low risk.
- Impact considered not significant due to low probability and absence of sensitive receptors.

Mitigation Measures:

Noise During Operation:

- Detailed noise modelling and assessment ongoing.

Shadow Flicker:

- Detailed assessment underway to identify potential effects on Wadi Dara Village.

Trespassing of Unauthorized Personnel:

- Implement Security Risk Assessment measures, including locked doors, fencing, onsite guards, and informative signs.

Worker Influx During Construction:

- Implement Worker Influx Plan, including medical examination, hygiene procedures, code of conduct, induction training, and COVID-19 procedures.

Security Personnel Management:

- Develop Security Management Plan adhering to IFC PS 4 and EBRD PR 2, ensuring appropriate hiring, conduct, training, and equipping of security personnel.

Blade and Tower Glint:

- Consider non-reflective finishes to mitigate potential impacts.

Monitoring and Reporting Requirements:

- A Security Management will be prepared which will identify appropriate measures for hiring, rules of conduct, training, equipping, and monitoring of security personnel to control and manage such issues.
- Implement a Worker Influx Plan addressing medical examinations, hygiene, and code of conduct.

- Provide induction training on contagious diseases and COVID-19 procedures.
- Development of a code of conduct for workers which takes into account appropriate behaviour by workers and EPC Contractor at all times, religious customs, traditional cultures and social norms in the area. In addition, it must include specifically requirements for social vices including gender-based violence, sexual harassment, alcoholism, drug abuse, etc.
- Induction training and awareness raising sessions on risks associated to the most common contagious diseases (e.g. influenza virus), communicable diseases, general measures for hygiene, code of conduct expected to be implemented and other as appropriate.

4. ENVIRONMENTAL & SOCIAL MANAGEMENT

The ESIA includes an Environmental and Social Management Plan (ESMP) which provides a high-level outline plan for managing and monitoring the environmental and social impacts during construction, operation and decommissioning of the Project. The ESMP identifies the mitigation measures which aim to eliminate and/or reduce the potential impact to acceptable levels and monitoring actions to ensure that the identified mitigation measures are implemented.

In addition, the development and implementation of an Environmental and Social Management System (ESMS) during the construction and operation is considered a key requirement under EBRD and IFC requirements. Therefore, IFP also prepared an ESMS Manual which includes the following:

- Identification of the overall structure and outline for the ESMS that will be implemented for the Project during both construction and operation;
- Identification and outline of the key procedures and plans to be developed at a later stage by the Contractors and Operator that will handle the key impacts and risks during construction and operation (e.g. air quality management plan, waste management plan, etc.)
- Identification of an institutional framework to ensure that such plans and procedures are implemented effectively and efficiently. This includes identification of roles and responsibilities, training requirements, monitoring and reporting requirements, and other as applicable;
- Identify approach for periodically auditing entities involved during the construction and operation phase to ensure that ESMS requirements are implemented effectively;
- Identification of a high-level framework for labour management that should be adhered to during the construction and operation phase; and
- Identification of a strategy and commitment in relation to local hiring and community support initiatives.

ESMP: Planning and Construction Phase across Environmental Attributes and Impacts**Table 5: ESMP for the Planning and Construction Phase**

Environmental Attribute	Potential Impact	Measures	Code	KPI	Scope	Frequency	Oversight, Implementor
Landscape and Visual	Visual and landscape impacts due construction equipment and machinery.	Ensure proper general housekeeping and personnel management: (i) construction site is orderly at the end of each workday; (ii) equipment, and vehicles that are not in use should be removed and kept in locations to reduce visual impacts to the area. (iii) Ensure proper storage, collection, and disposal of waste streams	Mitigation	Visual inspections	At construction active areas	Daily / Weekly	EPC Contractor
Land Use	Potential for informal land use. This includes the Ghafra system of the Bedouin groups and existing petroleum facilities within the area.	(i) Coordinate with Bedouin Groups for inclusion and engagement in employment and procurement opportunities. (ii) Implement SEP that includes specific references for engagement and coordination with Bedouin groups.	Additional requirement	Signed agreement / MoM with Bedouin groups	Not applicable	Once before Initiation of construction	Developer
	Formal land uses include the allocation of land (shared with the proposed project site) under the WDCALR to its members	Cede said land back to NREA in exchange for alternate lands.	Additional requirement	Signed agreement with WDCALR	Not applicable	Before Initiation of Construction	Developer

Environmental Attribute	Potential Impact	Measures	Code	KPI	Scope	Frequency	Oversight, Implementor
	Former dumpsite located within the Project site	Optimal option – complete removal of the dumpsite	Mitigation	Notice issued, letter of request	Construction active areas, maintain site security measures	Before commencement of construction	Developer
Geology, Hydrology and hydrogeology	Solid waste management	Coordinate with Ras Gharib City Council for the collection of solid waste from the site to the municipal approved dumpsite	Mitigation	Submitted contract	Not applicable	Once before commencement of construction	EPC Contractor
		Prohibit fly-dumping of any solid waste	Mitigation	Visual inspections	Active Construction Sites	Daily / weekly	
		Commitment to adherence to the waste hierarchy principle	Mitigation	Visual inspections	Active Construction Sites	Daily / weekly	
		Distribute litter bins and containers properly marked as "Municipal Waste"	Mitigation	Visual inspections	Active Construction Sites	Once before commencement of construction	
		Distribute a sufficient number of properly contained containers clearly marked as "Construction Waste" for the dumping and disposal of construction waste	Mitigation	Visual inspection	Active Construction Sites	Once before commencement of construction	
		Implement proper housekeeping practices	Mitigation	Visual inspections	Active Construction Sites	Daily / weekly	

Environmental Attribute	Potential Impact	Measures	Code	KPI	Scope	Frequency	Oversight, Implementor
		Complete removal of the dumpsite within the Project site to safeguard human, operational and conservation prerogatives	Mitigation	Excavation;	Dumpsite Location	Once	
		Maintain records of volumes of waste generated onsite, collected by contractor, and disposed	Mitigation	Submission of manifests	Not applicable	Throughout construction period	
	Wastewater management	Coordinate with Ras Gharib Water Company to hire a private contractor for the collection of wastewater from the site to the closest WWTP	Mitigation	Signed Contract	Not applicable	Once before commencement of construction	EPC Contractor
		Prohibit illegal disposal of wastewater to the land	Mitigation	Visual inspections	At construction active areas	Daily / weekly	
		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	Mitigation	Visual inspections	At applicable area	Once before commencement of construction	
		Ensure that septic tanks are emptied and collected by wastewater contractor at appropriate intervals to avoid overflowing	Mitigation	Visual inspection	At applicable area	Daily/weekly	

Environmental Attribute	Potential Impact	Measures	Code	KPI	Scope	Frequency	Oversight, Implementor
		Maintain records and manifests that indicate volume of wastewater generated onsite, collected by contractor, and disposed of at the WWTP	Mitigation	Submission of manifests	Not applicable	Throughout construction period	
	Hazardous Waste Management	Hire approved private contractor for the collection of hazardous waste from the site to the approved hazardous waste disposal facilities	Mitigation	Signed contract	Not applicable	Once before commencement of construction	EPC Contractor
		Ensure that hazardous waste is disposed in a dedicated area that is enclosed, of hard surface, with proper signage and suitable containers as per hazardous waste classifications and that they are labelled for each type of hazardous waste	Mitigation	Visual inspections	At applicable area	Once before commencement of construction	
		Ensure hazardous waste storage area is equipped with spill kit, fire extinguisher and anti-spillage trays and a hazardous waste inventory is available	Mitigation	Visual inspections	At applicable area	Daily / weekly	
		Prohibit illegal disposal of hazardous waste to the land	Mitigation	Visual inspections	At construction active areas	Daily / weekly	

Environmental Attribute	Potential Impact	Measures	Code	KPI	Scope	Frequency	Oversight, Implementor
		Possibly contaminated water (e.g. runoff from paved areas) must be drained into appropriate facilities (such as sumps and pits). Contaminated drainage must be orderly disposed of as hazardous waste	Mitigation	Visual inspections	At construction active areas	Daily / weekly	
		Ensure that containers are emptied and collected by the contractor at appropriate intervals to prevent overflowing	Mitigation	Visual inspections	At construction active areas	Daily / weekly	
		Maintain records and manifests that indicate volume of hazardous waste generated onsite, collected by contractor, and disposed of at the hazardous waste disposal facilities	Mitigation	Submission of manifests	Not applicable	Throughout construction period	
	Hazardous material management	Hazardous materials are stored in an area that is 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, and includes secondary containment systems	Mitigation	Visual inspections	At applicable area	Once before commencement of construction	EPC Contractor

Environmental Attribute	Potential Impact	Measures	Code	KPI	Scope	Frequency	Oversight, Implementor
		Maintain a register of all hazardous materials used and accompanying MSDS must present at all times. Spilled material should be tracked and accounted for	Mitigation	Visual inspections	At applicable area	Daily / weekly	
		Incorporate dripping pans at machinery, equipment, and areas that are prone to contamination by leakage of hazardous materials (such as oil, fuel, etc.)	Mitigation	Visual inspections	At construction active areas	Daily / weekly	
		Maintenance activities and other activities that pose a risk for hazardous material spillage (such as refuelling) must take place at a suitable location (hard surface) with appropriate measures for trapping spilled material	Mitigation	Visual inspections	At construction active areas	Daily / weekly	
		Ensure that a minimum of 1,000 litters of general-purpose spill absorbent is available at hazardous material storage facility.	Mitigation	Visual inspections	At applicable area	Daily / weekly	
		If spillage on soil occurs, spill must be immediately contained, cleaned-up, and contaminated soil disposed as hazardous waste	Mitigation	Visual inspection	At applicable area	Upon occurrence	
	Erosion and runoff management	Avoid executing excavation works under aggressive weather conditions	Mitigation	Visual inspections	At construction active areas	Upon occurrence	EPC Contractor

Environmental Attribute	Potential Impact	Measures	Code	KPI	Scope	Frequency	Oversight, Implementor
		Place clear markers indicating stockpiling area of excavated materials to restrict equipment and personnel movement, thus limiting the physical disturbance to land and soils in adjacent areas	Mitigation	Visual inspections	At construction active areas	Daily / weekly	
		Erect erosion control barriers around work site during site preparation and construction to prevent silt runoff where applicable such as silt fences, gravel bas berms, fiber rolls, and other.	Mitigation	Visual inspections	At construction active areas	Daily / weekly	
		Return surfaces disturbed during construction to their original (or better) condition to the greatest extent possible	Mitigation	Visual inspections	At construction active areas	Upon occurrence	
Biodiversity		Implement Biodiversity Management Plan (BMP) which is provided as a standalone document.	Mitigation	Refer to BMP	At applicable area	Refer to BMP	EPC Contractor

Environmental Attribute	Potential Impact	Measures	Code	KPI	Scope	Frequency	Oversight, Implementor
	Construction activities would disturb existing habitats (flora and fauna). In addition, other impacts could be from improper management of the site (e.g. improper conduct and housekeeping practices).	Undertake a detailed Egyptian Dabb Lizard survey through a biodiversity expert. The survey should focus on all construction activities areas and in particular the Wadi systems where such a species is likely to be located. Should burrows and/or records of this species be identified, relocation activities should be undertaken to nearby similar habitats.	Additional Survey	Submission of report	Prior to construction	Once; before construction	EPC Contractor
		Implement proper housekeeping practices on the construction site at all times	Mitigation	Visual inspections	At construction active areas	Daily / weekly	EPC Contractor
Birds (avi-fauna)	Construction activities could disturb existing habitats of birds breeding and/or nesting within the Project site.	Implement proper housekeeping practices on the construction site at all times	Mitigation	Visual inspections	At construction active areas	Daily / weekly	EPC Contractor
		Submission of mitigation measures sufficient to achieve No Net Loss (NNL) or even Net Gain (NG) status in accordance with Performance Standards (PS6-IFC/WBG) and Requirements (PR6-EBRD).	Mitigation, Additional Study and Requirement	Submission of Report	Prior to construction	Once – prior to construction	EPC Contractor
		Regarding Zone 2 (NREA Concession Area) submit Ornithological Study prior to commence construction	Additional Survey / Study and Requirement	Submission of Report	Prior to construction	Once – prior to construction	EPC Contractor

Environmental Attribute	Potential Impact	Measures	Code	KPI	Scope	Frequency	Oversight, Implementor
		Removal / excavation of dumpsite	Additional Precautionary Action	Excavation / Landscaping	Dumpsite located within site	Prior / during construction	Contractor
		Develop a protocol to swiftly report and dispose of any dead or injured wildlife or animals recorded onsite.	Mitigation	Submission of report	Prior to construction	Prior to construction	EPC Contractor
Archaeology and Cultural Heritage	Improper management of construction activities could disturb/damage archaeological remains which could be buried in the ground (if any).	As required by the SCA, SCA must be notified to to oversee the process	Mitigation	Submission of evidence of communication with SCA	Not applicable	Prior to construction	EPC Contractor
		Measures for construction activities to be halt upon discovery of archaeological finds; notify the Ministry of Tourism and Antiquities/Red Sea and Suez Antiquities Inspection Office. Work halts until confirmation clearance to resume the work is provided.	Mitigation	Visual inspections and submittal of chance find report	At applicable area	Upon occurrence	EPC Contractor
Air Quality and Noise		If found to be excessive due to construction, the source of such emissions should be identified and adequate control measures must be implemented (as identified below)	Mitigation	Visual inspections	Active construction areas, nearby receptors and internal road networks	Upon occurrence	EPC Contractor

Environmental Attribute	Potential Impact	Measures	Code	KPI	Scope	Frequency	Oversight, Implementor
	Probably increase in dust, particulate matter and pollutant emissions as well as noise which in turn will directly impact ambient air quality and noise levels.	Comply with the Occupational Safety and Health Administration (OSHA) requirements and the Egyptian Codes to provide PPE for workers to protect against dust and noise.	Mitigation	Visual inspections	At construction active areas	Daily / weekly	
		Apply basic dust control and suppression measures: (i) regular watering of roads; (ii) anticipate and manage dust-causing activities; (iii) manage stockpiles and excavated material via watering, containment, covering, bundling; (iv) cover trucks transporting aggregates and fine materials; (v) enforce site-speed limit of 15km/h	Mitigation	Visual inspections	At active construction areas	Daily / weekly	
		Develop a regular inspection and scheduled maintenance program for vehicles, machinery, and equipment for early detection to avoid unnecessary pollutant and noise emissions	Mitigation	Submission of maintenance program	Not applicable	Monthly	

Environmental Attribute	Potential Impact	Measures	Code	KPI	Scope	Frequency	Oversight, Implementor
		If noise levels were found to be excessive from construction activities, the source of such excessive noise levels should be identified and adequate control measures must be implemented	Mitigation	Visual inspections	At active construction areas and receptors to include petroleum storage facilities	Upon occurrence	
		Apply adequate general noise suppressing measures: well-maintained mufflers and noise suppressants for high-noise generating equipment and machinery, regular maintenance of all vehicles, machinery, and equipment.	Mitigation	Visual inspections	At construction active areas	Daily / weekly	
Infrastructure and Utilities	Traffic and transport management	Develop Traffic and Transport Plan to reduce risk of damage to the existing roads, highways, overpasses whilst ensuring public safety including analysis of the entire route; investigate constraints along the highways and identify accommodations which need to be taken into account.	Additional study	Submission of Traffic and Transport Plan and approval from local authorities	Not applicable	Once before commencement of construction	EPC Contractor

Environmental Attribute	Potential Impact	Measures	Code	KPI	Scope	Frequency	Oversight, Implementor
	Civil and Military Aviation	Provide information on the Project to relevant office and details of design to include setback distances if required (e.g. from radar systems if applicable) and navigational safety requirements (e.g. navigational lights, blade paintings, etc.)	Additional requirement	Submission of formal non-objection letter (or similar) with relevant entity	Not applicable	Once before commencement of construction	Developer
	Improper planning and design of project could affect petroleum facilities	Coordinate through NREA to the General Petroleum Company's head office in Cairo to discuss and determine requirements for the detailed design of the Project as well as coordination agreement requirement during the construction and operation phase (e.g. avoidance of areas, buffer distances to be considered, etc.)	Additional requirement	Coordination activities are initiated no less than six (6) months prior to construction Submission of formal communication letter (or similar) with relevant entity	Not applicable	Once before commencement of construction	Developer
	Water resources management	Coordinate with the Ras Ghareb Water Company to sector the water requirements of the Project	Additional requirement	Submission of formal communication letter (or similar) with Ras Ghareb Water Company	Not applicable	Once before commencement of construction	EPC Contractor

Environmental Attribute	Potential Impact	Measures	Code	KPI	Scope	Frequency	Oversight, Implementor
	Waste utilities	(i) coordinate with the Ras Ghareb Water Company to select authorized contractors for collection of wastewater from the site; (ii) coordinate with the Ras Gharib City Council to hire a private contractor for the collection of solid waste; and (iii) obtain list of authorized contractors for collection of hazardous waste	Additional requirement	Submission of formal communication letter with relevant entities	Not applicable	Once before commencement of construction	EPC Contractor
	Telecommunication and TV/Radio management	Coordinate through NREA/EETC to relevant entity and other applicable local agencies; provide information on the Project (location and specifications of turbines, etc.) and other requested requirements that may determine setback distances if required	Additional requirement	Coordination activities are initiated > (6) six months prior to construction Formal communication letter submitted	Not applicable	Once before commencement of construction	Developer
	Nearby Wind Farms	Further follow/communication with NREA to ensure if buffer distance of the Project from other nearby wind farm projects is sufficient	Mitigation	Submission of formal communication letter with relevant entities	Not applicable	Once before commencement of construction	Developer

Environmental Attribute	Potential Impact	Measures	Code	KPI	Scope	Frequency	Oversight, Implementor
Occupational Health and Safety	There will be some generic risks to workers health and safety from working on construction sites, as it increases the risk of injury or death due to accidents.	Develop and submit an Occupational Health and Safety Plan (OHSP) that is project and site specific to ensure the health and safety of all personnel in order to concur and maintain a smooth and proper progress of work at the site and prevent accident which may injure personnel or damage property.	Additional study	Submission of OHSP plan	Not applicable	Once before commencement of construction	EPC Contractor
		Develop and submit an Emergency preparedness and Response Plan that is project- and site-specific, accounting for all potential emergency situations onsite to ensure the health and safety of all personnel and property onsite.	Additional study	Submission of EPRP	Not applicable	Once before commencement of construction	EPC Contractor

Environmental Attribute	Potential Impact	Measures	Code	KPI	Scope	Frequency	Oversight, Implementor
Human Rights	Inappropriate management of the workforce resulting in human right risks and violations by employing entities: EPC Contractor and Project Operator. This could include, but not limited to, engaging child workers, confiscation of passports of foreign workers, unsuitable working hours, and other.	(i) Provide reasonable and lawful working conditions and terms of employment (ii) Recognize workers' rights to form and to join workers' organizations and to bargain collectively (iii) Prohibit child labour within the workforce (iv) Prohibition of forced labour (v) Non-discrimination throughout the entire work cycle (vi) Provide equal opportunities for all throughout procurement and employment opportunities including women groups (vii) Management of daily workers, migrant workers and third-party workers	Mitigation	(i) Monthly inspections against the developed HR procedure (ii) Submission of HR inspection report that identifying corrective measures undertaken	At applicable area	Monthly	EPC Contractor

Environmental Attribute	Potential Impact	Measures	Code	KPI	Scope	Frequency	Oversight, Implementor
Public health and safety	Relatively large worker influx could result in H&S, Sexual exploitation and assault (SEA) issues such as risk of diseases, inappropriate code of conduct, social vices, etc.	Submit a worker influx plan which takes into account the following: (i) medical examination program for workers; (ii) procedures to maintain hygienic conditions onsite; (iii) code of conduct for workers; (iv) induction training and awareness requirements for risk of diseases, etc; (v) consider impacts from workers migration into nearby communities including pressure on rental accommodations and infrastructures	Additional study	Submission of worker influx plan	Not applicable	Once before commencement of construction	EPC Contractor
	Mismanagement of security issues and incidents by personnel towards local communities, resulting in resentment, distrust and escalation of events	Develop Security Management Plan identifying measures for hiring, rules of conduct, training, equipping, and monitoring of security personnel to control and manage such issues	Additional study	Submission of security management plan	Not applicable	Once before commencement of construction	EPC Contractor

Environmental Attribute	Potential Impact	Measures	Code	KPI	Scope	Frequency	Oversight, Implementor
Socio-economics	The Project is expected to provide job opportunities for local communities. This, to some extent, could contribute to enhancing the living environment for its inhabitants, elevate their standards of living, and bring social and economic prosperity	Local Recruitment Procedure: announce the number of job opportunities for local communities to include skilled and unskilled workers, including fresh graduates engineers, technicians, labourers, etc and selection process that is transparent and non-discriminatory. Local Procurement Procedure: Prioritization of procurement from local communities in a transparent and non-discriminatory means from announcement to selection. Social Responsibility Program: the Developer is to implement an SRP to benefit the local communities in a structured approach that identifies priority development projects benefitting local communities (e.g. based on a needs assessment if available). Based on that the SRP, projects can be prioritized based on available budget, company vision, timeline for implementation as well as other factors.	Recommendation	Regular reporting on outcomes of Program implementation	Not applicable	Continuous	Project Developer/EPC Contractors

ESMP: Operational Phase across Environmental Attributes and Impacts

Table 6: ESMP for the Operation Phase

Environmental Attribute	Potential Impact	Measures	Code	KPI	Scope	Frequency	Oversight, Implementor
Geology, Hydrology and hydrogeology	Solid waste management	Coordinate with Ras Gharib City Council for the collection of solid waste from the site to the municipal approved dumpsite	Mitigation	Submit contract	N/A	Once, Prior to operation	Project Operator
		Prohibit fly-dumping of any solid waste to the land	Mitigation	Visual inspections	At active areas	Daily / weekly	
		Distribute litter bins and containers properly marked as "Municipal Waste"	Mitigation	Visual inspections	At active areas	Once, Prior to operation	
		Implement proper housekeeping practices onsite at all times	Mitigation	Visual inspections	At active areas	Daily / weekly	
		Maintain records indicating volume of waste generated onsite, collected by contractor, and disposed of at the landfill	Mitigation	Submit manifests	N/A	Throughout operational period	
	Wastewater management	Coordinate with Ras Gharib Water Company to hire a private contractor for the collection of wastewater from the site to the closest WWTP	Mitigation	Submit contract	N/A	Once, Prior to operation	Project Operator
		Prohibit illegal disposal of wastewater to the land	Mitigation	Visual inspections	At active areas	Daily / weekly	
		Ensure that septic tanks are emptied and collected by wastewater contractor at appropriate intervals	Mitigation	Visual inspection	At applicable areas	Daily/weekly	

Environmental Attribute	Potential Impact	Measures	Code	KPI	Scope	Frequency	Oversight, Implementor
		Maintain records indicating volume of wastewater generated onsite, collected by contractor, and disposed of at the WWTP	Mitigation	Submit manifests	N/A	Throughout operational period	
	Hazardous waste management	Hire approved private contractor for the collection of hazardous waste (including electrical waste) to waste disposal facilities	Mitigation	Submit contract	N/A	Once, Prior to operation	Project Operator
		Ensure that hazardous waste is disposed in a dedicated, enclosed area, of hard surface and suitable, labelled containers for each classification of hazardous waste type	Mitigation	Visual inspections	At applicable areas	Once, Prior to operation	
		Ensure hazardous waste storage area is equipped with spill kit, fire extinguisher and anti-spillage trays and a hazardous waste inventory is available	Mitigation	Visual inspections	At applicable areas	Daily / weekly	
		Prohibit illegal disposal of hazardous waste to the land	Mitigation	Visual inspections	At active areas	Daily / weekly	
		Possibly contaminated water (e.g. runoff from paved areas) must be drained into appropriate facilities (such as sumps and pits). Contaminated drainage must be orderly disposed of as hazardous waste	Mitigation	Visual inspections	At active areas	Daily / weekly	

Environmental Attribute	Potential Impact	Measures	Code	KPI	Scope	Frequency	Oversight, Implementor
		Ensure that containers are emptied and collected by the contractor on a regular basis	Mitigation	Visual inspections	At active areas	Daily / weekly	
		Maintain records of volumes hazardous waste generated onsite, collected by contractor, and disposed of at the hazardous waste disposal facilities	Mitigation	Submit manifests	N/A	Throughout operational period	
	Hazardous material management	Ensure that hazardous materials are stored in an area that is 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	Mitigation	Visual inspections	At applicable area	Once, Prior to operation	Project Operator
		Maintain a register of all hazardous materials used and accompanying MSDS must present at all times. Spilled material should be tracked and accounted for	Mitigation	Visual inspections	At applicable area	Daily / weekly	
		Incorporate dripping pans at machinery, equipment, and areas that are prone to contamination by leakage of hazardous materials (such as oil, fuel, etc.)	Mitigation	Visual inspections	At active areas	Daily / weekly	

Environmental Attribute	Potential Impact	Measures	Code	KPI	Scope	Frequency	Oversight, Implementor
		Maintenance activities and other activities that pose a risk for hazardous material spillage (such as refuelling) must take place at a suitable location (hard surface) with appropriate measures for trapping spilled material	Mitigation	Visual inspections	At active areas	Daily / weekly	
		Ensure that a minimum of 1,000 litters of general-purpose spill absorbent is available at hazardous material storage facility.	Mitigation	Visual inspections	At applicable area	Daily / weekly	
		If spillage on soil occurs, spill must be immediately contained, cleaned-up, and contaminated soil disposed as hazardous waste	Mitigation	Visual inspection	At applicable area	Upon occurrence	
Biodiversity	Improper management of the site could disturb existing habitats (e.g. improper conduct and housekeeping practices).	Implement proper management measures to prevent damage to the biodiversity of the site.	Mitigation	Inspection	At applicable area	Continuous	Project Operator
Birds (avi-fauna)		Avi-Fauna Monitoring and On-Demand Turbine Shutdown	Mitigation	Submission of report	At active areas	Continuous	Consultant
		Avi-Fauna Carcass Search during Operation	Additional requirement	Submission of report	At active areas	Continuous	

Environmental Attribute	Potential Impact	Measures	Code	KPI	Scope	Frequency	Oversight, Implementor
	Wind turbines are associated with impacts on birds from risks of strikes and collision on both migratory soaring birds and resident soaring birds in the area. Generally, such impacts depend on several factors but could affect the population levels of certain species especially those with international/national critical conservation status.	Carcass Search Surveys	Additional requirement	Submission of report	At active areas	Continuous	
Bats	The potential impacts from the Project during operation are mainly related to risk of bat strikes and collisions with rotors of the operating wind turbines.	Undertake at height bat acoustic surveys for one (1) year during first or second year of operations. Such acoustic surveys will be done at the met masts and should be undertaken by a third-party entity with experience in bat assessments and studies.	Mitigation	Submission of report	At active areas	Once during operation	Project Operator
		Carcass Search Surveys	Mitigation	Submission of report	At active areas	Continuous	Consultant
Infrastructure and Utilities	Water resources management	Coordinate with the Ras Gharib Water Company to sector the water requirements of the Project.	Additional requirement	Submit formal communication letter (or similar) with Ras Gharib Water Company	N/A	Once before commencement of construction	Project Operator

Environmental Attribute	Potential Impact	Measures	Code	KPI	Scope	Frequency	Oversight, Implementor
	Waste utilities	Undertake the following: (i) coordinate with the Ras Gharib Water Company and obtain list of authorized contractors for collection of wastewater from the site; (ii) coordinate with the Ras Gharib City Council to hire a competent private contractor for the collection of solid waste from the site; and (iii) obtain list of authorized contractors for collection of hazardous waste from the site	Additional requirement	Submit formal communication letter with relevant entities	N/A	Once before commencement of construction	Project Operator
Occupational Health and Safety	There will be some generic risks to workers health and safety from working on construction sites, as it increases the risk of injury or death due to accidents.	Develop and submit an Occupational Health and Safety Plan (OHSP) that is project and site specific to ensure the health and safety of all personnel in order to concur and maintain a smooth and proper progress of work at the site and prevent accident which may injure personnel or damage property.	Additional study	Submit OHSP plan	N/A	Once, Prior to operation	Project Operator
Human Rights		Providing reasonable working conditions and terms of employment to include but not limited to contract management, working hours, salaries/wages, annual and medical leaves, bereavement leaves, accommodation, etc.	Mitigation	Submit HR inspection report with corrective measures undertaken	N/A	Monthly	EPC Contractor

Environmental Attribute	Potential Impact	Measures	Code	KPI	Scope	Frequency	Oversight, Implementor
	Inappropriate management of the workforce during the construction phase could entail several human right risks and violations by employing entities such as the EPC Contractor and Project Operator. This could include but not limited to engaging child workers, confiscation of passports of foreign workers, unsuitable working hours, and other.	Recognizing workers' rights to form and to join workers' organizations and to bargain collectively	Mitigation	Submit inspection report with corrective measures undertaken	HR	N/A	Monthly
		Prohibition of child labour within the workforce	Mitigation	Submit inspection report with corrective measures undertaken	HR	N/A	Monthly
		Overall management of young workers within the labour force	Mitigation	Submit inspection report with corrective measures undertaken	HR	N/A	Monthly
		Prohibition of forced labour	Mitigation	Submit inspection report with corrective measures undertaken	HR	N/A	Monthly
		Non-discrimination throughout the entire work cycle in all its forms	Mitigation	Submit inspection report with corrective measures undertaken	HR	N/A	Monthly
		Providing equal opportunities for all throughout procurement and employment opportunities including women groups	Mitigation	Submit inspection report with corrective measures undertaken	HR	N/A	Monthly

Environmental Attribute	Potential Impact	Measures	Code	KPI	Scope	Frequency	Oversight, Implementor
		Overall management of daily workers, migrant workers and third-party workers	Mitigation	Submit HR inspection report with corrective measures undertaken	N/A	Monthly	
Public Health and Safety	Public access of unauthorized personnel to the various Project components.	A Security Risk Assessment should be developed for the Wind Farm Project and which takes into account the following: (i) each turbine to be fitted with locked doors to prevent unauthorized access to the turbines; (ii) substation area to be completely fenced with concrete walls to prevent unauthorized access; (iii) onsite guards; (iv) post informative signs on the turbines and substation about public safety hazards and emergency contact information, and other as applicable.	Additional study	Submit Security Risk Assessment	N/A	Once, Prior to operation	Project Operator
	Inappropriate management of security issues and incidents by security personnel towards local communities could result in resentment, distrust and escalation of events	Prepare a Security Management Plan that identifies appropriate measures for hiring, rules of conduct, training, equipping, and monitoring of security personnel to control and manage such issues	Additional study	Submit security management plan	N/A	Once, Prior to operation	Project Operator

Environmental Attribute	Potential Impact	Measures	Code	KPI	Scope	Frequency	Oversight, Implementor
	Blade or tower glint can impact nearby receptors in the area	Consideration should be given to the use of non-reflective finishes to ensure potential impacts are not significant	Mitigation	Visual inspection	Turbines	Once, Prior to operation	Project Operator
Socio-economics	The Project is expected at a minimum to provide job opportunities for local communities. This, to some extent, could contribute to enhancing the living environment for its inhabitants, elevate their standards of living, and bring social and economic prosperity	Local Recruitment Procedure: announce the number of job opportunities for local communities to include skilled and unskilled workers, including fresh graduates engineers, technicians, labourers, etc and selection process that is transparent and non-discriminatory. Local Procurement Procedure: Prioritization of procurement from local communities in a transparent and non-discriminatory means from announcement to selection. Social Responsibility Program: the Developer is to implement an SRP to benefit the local communities in a structured approach that identifies priority development projects benefitting local communities (e.g. based on a needs assessment if available). Based on that the SRP, projects can be prioritized based on available budget, company vision, timeline for implementation as well as other factors.	Recommendation	Regular reporting on outcomes of Program implementation	N/A	Continuous	Project Developer/ Operator

5. STAKEHOLDER ENGAGEMENT PLAN (SEP)

A Stakeholder Engagement Plan (SEP) was developed which will be implemented for the Project. The SEP identifies in details the stakeholders that are relevant to the Project to include local communities, national governmental and permitting authorities, local government, Non-Governmental Organizations (NGOs) and other. The SEP identifies previous stakeholder engagement activities undertaken for the Project and the key outcomes of such engagement activities. This included in particular several entities such as Red Sea Governorate, Ras Gharib City Council, Bedouin Groups, General Petroleum Company and other. In addition, it also describes the outcomes of a public disclosure session that was undertaken in Ras Gharib City with local communities and other key local governmental entities.

The SEP also identifies in detail a future stakeholder engagement strategy and plan which identifies activities that will be undertaken throughout the Project duration, which provides an opportunity for all stakeholders, including local communities, to express their views and interact with the Project.

The SEP also includes a stakeholder grievance mechanism that is responsive to any concerns and complaints from affected stakeholders and communities.

6. ESIA DISCLOSURE & CONTACT DETAILS

It is of utmost necessity to ensure that stakeholders are kept well informed about the Project throughout its life cycle, thus information will be accessible to the public, key stakeholders, and local communities through dissemination of related documents.

The disclosure package will include the following key documents that are available publicly in Arabic and English language.

- Environmental and Social Impact Assessment (ESIA) for the Wind Farm
- Non-Technical Summary (NTS)
- Stakeholder Engagement Plan (SEP)
- Cumulative Effect Assessment (CEA)
- Critical Habitat Assessment (CHA)
- Environmental and Social Management System (ESMS) Manual
- Environmental and Social Action Plan (ESAP)

The above documents are available at the following avenues:

- African Development Bank (AfDB) website (<http://www.afdb.org/>)
- Hard copies available at Red Sea Governorate and Ras Ghareb Local Governmental Unit

Ras Ghareb City Council

Location: Al-Mina Street

City: 11432 Ras Ghareb – Red Sea

Tel: 01001318480 – 01201958777

- Soft copies can also be made available to stakeholders via email to:
gawhara.abdelrahman@rasgharebwind.com

To communicate the outcomes of the above process, a public disclosure session will be announced and implemented to communicate with stakeholders.

An advertisement will be taken out in the national newspaper about the project, the availability of the disclosure package and the details about an upcoming disclosure event. The same will be done on the Project's website and LinkedIn. In addition, corresponding leaflets will be distributed in Ras Ghareb amongst the key stakeholders in the city, its Military Authorities, Governmental Institutions and the municipality.

The disclosure event will likely take the form of a Facebook Live event. A link and invite to this event will also be provided on the official page for Ras Ghareb city on Facebook. The event will also include a Q&A session. The whole event will be recorded and a summary report on the event and the Q&A session will be made available.