ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

NON-TECHNICAL SUMMARY (NTS)

YANBU WIND ENERGY PARK – 700 MW

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1. INTRODUCTION

Yanbu Wind Park project (hereinafter "the Project") is located at a distance of approximately 50 km north-west Industrial City of Yanbu in Saudi Arabia . The location is mostly undeveloped with an area of approximately 103 km2 (refer table 1-1). The overall plant capacity is expected to be close to 669.9 MW. The Project is being developed by a Joint Venture (JV) between Marubeni Corporation and Abdul Aziz Al Ajlan Sons Company For Commercial & Real Estate Investment-– Ajlan and Bros.

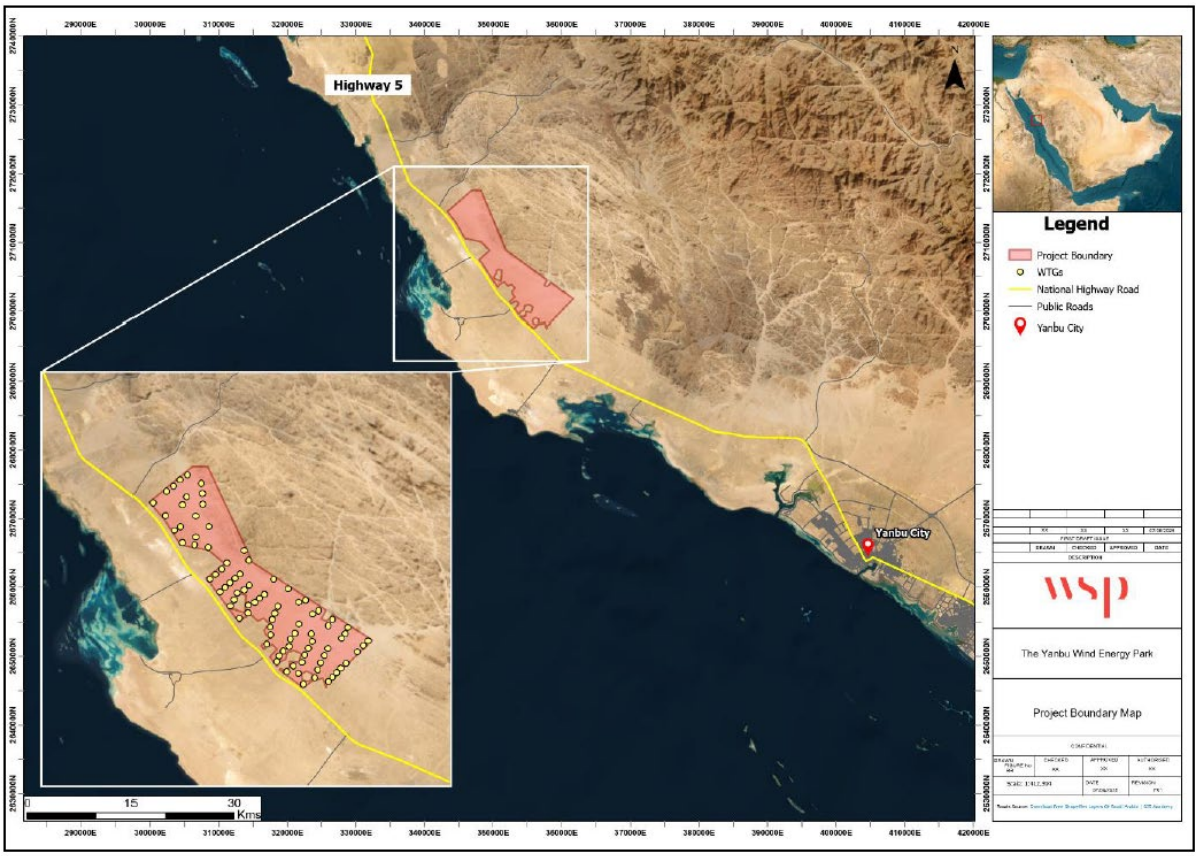

Figure 1-1 Project Location

Table 1-1 Project Location and Specifications

Location	Specifications
Location	50 km north-west of Yanbu
Country	KSA
Site area	103 km^2
Site Coordinates (°N, °E) (Centroid)	352704.92 m E, 2705598.57 m N
Altitude	12-130 m (Approx.)

In Quarter four (Q4) of 2020, a new site boundary and constraint conditions were established by the MoE for the Project. In Quarter two (Q2) of 2021, the ESIA was amended and updated to account for these changes. Many of the original constraints are no longer applicable which opens up additional land for development. In addition, it should be noted that the generation capacity of the proposed Wind Turbine Generator (WTG) has increased from 4.2 MW to 6.0 MW, in line with current onshore WTG technology. As the exportation capacity to the grid is capped at 850 MW, this increase in WTG size has resulted in the number of WTGs decreasing from 272 to 142. As per the latest design, the proposed WTG holds a rated capacity of 7.7 MW whereas the exportation capacity to the grid is now capped at 700 MW. This increase in WTG size has resulted in the number of WTGs decreasing from 142 to 87
The current design, which has been assumed for the purpose of this amended ESIA summary prepared by WSP, is presented in Table 1-1.

Table 1-2 Windfarm Design

Description	Current Design	Original Design
Generation capacity (MW)	669.9MW	850 MW
Turbine hub height (M)	110	160
Turbine rated power (MW)	7.7	4.2 up to 6.0 MW
Rotor diameter (M)	197.3	140
Number of wind turbines	87	142

It should be noted that the number of turbines and overall generation capacity of the windfarm is significantly reduced. Therefore, while the individual turbine size, turbine height and rotor diameter are increased in the new design, it is expected that the predicted environmental and social impacts of the new design will generally be reduced compared to those associated with the original design.

The Associated facilities to the Project include the following:

- A switching substation that will be constructed on the site.
- Connection from the switching substation to the transmission lines that already exist in close proximity to the site.

These assets will be developed, owned and operated by the Saudi Electricity Company (SEC) and are outside the scope of the ESIA.

This NTS provides a summary in non-technical language of the findings contained in the ESIA Report. The updated ESIA Report contains more detailed information on the Project. It includes an Environmental and Social Management Plan (ESMP) which describes the monitoring and mitigation requirements for the duration of the project, including responsibilities and any legal requirements.

2. ASSESSMENT METHODOLOGY

To be consistent with the initial ESIA, this ESIA Addendum has followed the same assessment methodology as of the initial ESIA. Where relevant, assessment has been updated and mitigation measures have been provided.

3. ESIA SCOPE AND OBJECTIVES

The original ESIA for the windfarm development was prepared by Wood in 2021 and approval was obtained from the Saudi National Center for Environmental Compliance (NCEC) in accordance with local Saudi regulations. The proposed Project has been classified as Category 3 as per NCEC response to the Project Environmental Classification Form. The NCEC issued the permit on March 19, 2023, and it is valid until August 05, 2025.
During discussions with the Project Developer's representative, it was confirmed that the permit renewal will not be required given the construction on site started on 31st July 2025. The Project Developer received the confirmation from NCEC on September 2025 that no permit renewal is required for the Project during the construction phase.
WSP is advised that the original ESIA was completed and is broadly consistent with International Finance Corporation (IFC) requirements for ESIAs at the time that the original ESIA was prepared.
WSP was commissioned by the Client to review the original ESIA and amend the ESIA where required to meet the requirements of the following guidelines and standards for ESIAs:

- International Finance Corporation (IFC) Performance Standards (PSs);
- Equator Principles IV (EP IV);
- IFC Environment, Health & Safety (EHS) General Guidelines;
- IFC Environment, Health & Safety (EHS) Guidelines for Wind Energy; and
- The Japan Bank for International Cooperation (JBIC) Environmental Guidelines.

In undertaking this work, WSP recognizes the original work of Wood and has only amended the ESIA where strictly necessary to comply with the above requirements.

4. ORIGINAL ESIA SCOPE AND OBJECTIVES

The scope of work for the Project requires the preparation of an ESIA report based on Saudi national legal requirements, Equator Principles, International Finance Corporation (IFC) Performance Standards and World Bank Environmental, Health, and Safety (EHS) Guidelines. This ESIA provides the legal framework, the proposed project description, description of the receiving environment, the identification and analysis of impacts during the project phases and frameworks for various management plans.

In order to successfully develop this Project, the following requirements must be met:

- The Project would meet KSA national requirements and international lending standards.
- The Project would include all necessary mitigation measures to minimise any significant adverse change in environmental, health and safety, and socio-economic conditions.
- Limited public consultation and disclosure are undertaken in line with Equator Principles (EPs) and International Finance Corporation (IFC) Performance Standards (PSs) ensuring all reasonable public opinions are adequately considered prior to a commitment for financing.

To ensure compliance with international lending requirements, the overall scope of this assessment includes:

- Identification of key issues.
- Definition of baseline conditions of key environmental and social resources.
- Assessment of positive and negative impacts of the Project.
- Limited consultation with people who may be affected by the Project.
- Development of design and operating practices that are sufficient to avoid, reduce, or compensate for significant adverse environmental and social impacts.
- Development of such monitoring programs as are necessary to verify mitigation is effective in accomplishing its goals, and to develop and refine the effectiveness of mitigation measures.

The objective of the ESIA is to identify, evaluate, and mitigate major risks associated with the proposed action. Specifically, the ESIA will assess the impacts of the construction and operation on both the natural environment (e.g., air, water, and biodiversity) and on socioeconomic conditions (e.g., local communities, cultural heritage, and regional economics) following recognised good practice guidance.

5. CLIMATE AND METEOROLOGY

5.1. CLIMATE

The Kingdom of Saudi Arabia is distinguished by five primary landforms: desert, plain, plateau, mountains, and lava flows as presented in (Figure 5-1). Approximately 30% of the Arabian Peninsula is covered by sand in the form of extensive sand seas[1] . Yanbu Wind Energy Park is located approximately 50 km northwest of Yanbu Al Bahar (Yanbu), 13 km southwest of Abu Shakeyr, and ~1 km north–northwest of the village of Al Nabah, in the Al Madinah province.

[1] The Kingdom of Saudi Arabia (2018). The First Biennial Update Report. Available at 18734625_Saudi Arabia-BUR1-1-BUR1-Kingdom of Saudi Arabia.pdf

Figure 5-1 The Kingdom of Saudi Arabia's Geological Setting and Project Location[2]

5.2. TEMPERATURE, PRECIPITATION AND HUMIDITY

Climate variations in Saudi Arabia are most distinct between coastal and interior regions. During summer, inland areas experience higher temperatures compared to coastal regions, whereas in winter, the Red Sea coastline records relatively warmer temperatures[3]. The climate of Yanbu is characterized by arid and dry conditions typical of a desert region.

According to the data obtained from the Yanbu-Abdulaziz International Airport weather station, the hottest months of the year are June, July, and August, with maximum average temperatures reaching 41.96 °C, 40.6 °C, and 40.54 °C, respectively. The coldest months are January and December, with minimum average temperatures of 15.35 °C and 17.3 °C, respectively. Based on (Figure 5-2), the monthly averages show maximum, mean, and minimum temperatures of 41.96 °C, 34.12 °C, and 26.97 °C in June (summer), compared to 26.9 °C, 21.03 °C, and 15.35 °C in January (winter).

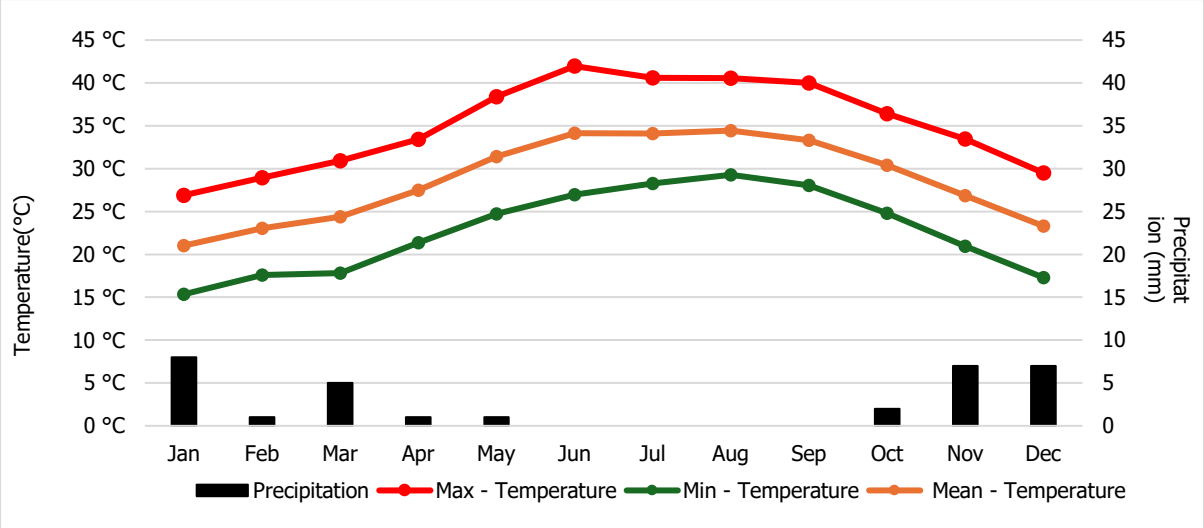

Figure 5-2 Monthly average mean, maximum, and minimum temperatures and monthly total precipitation data for a typical meteorological year, Yanbu-Abdulaziz International Airport, 2009-2023 reference period

[2] The Kingdom of Saudi Arabia (2018). The First Biennial Update Report. Available at 18734625_Saudi Arabia-BUR1-1-BUR1-Kingdom of Saudi Arabia.pdf
[3] The Kingdom of Saudi Arabia (2016). Third National Communication of the Kingdom of Saudi Arabia. Available at https://unfccc.int/documents/81607

According to the data obtained from the Yanbu-Abdulaziz International Airport weather station, the highest recorded average precipitation near the project site is 8 mm in January, whereas there was no precipitation in June, July, August, and September, as shown in (Figure 5-2).

Relative humidity is highest during October and November and lowest in June. Based on (Figure 5-3). The average monthly maximum, mean, and minimum relative humidities are 61.2%, 42.4%, and 26.6% in June, respectively, compared to 75.6%, 56.8%, and 39.9% in October.

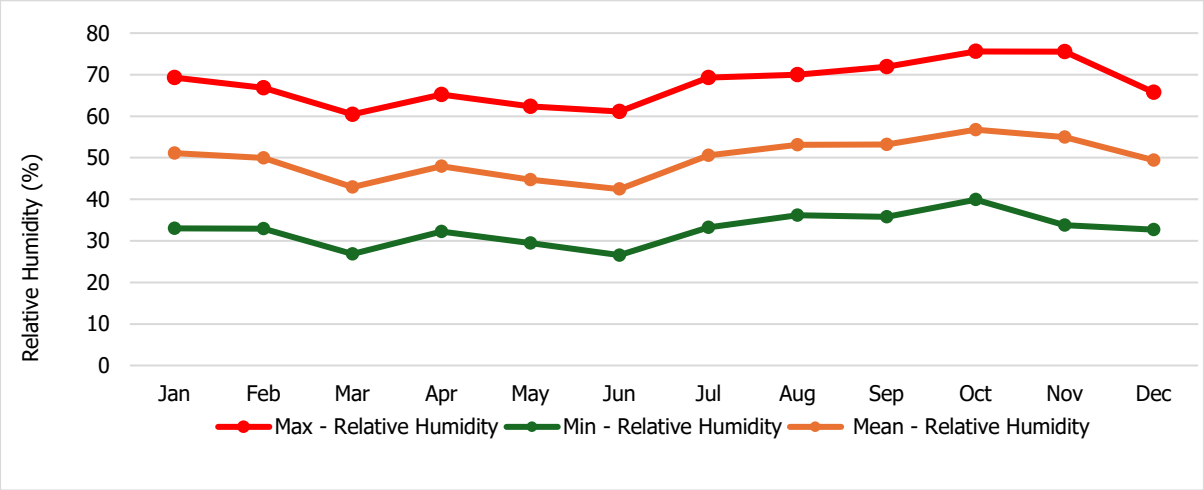

Figure 5-3 Average maximum, mean, and minimum monthly relative humidity, Yanbu-Abdulaziz International Airport, 2009-2023 reference period.

5.3. AIR QUALITY

The air quality impact assessment considered the relevant national standards with regards to air quality[45]. Baseline air quality measurements are required in order to inform the ESMP and ongoing monitoring of environmental performance. These baseline assessments have been carried out by Dakkak Trading Group (DTG) using their Mobile Air Quality Monitoring System (MAQMS). The MAQMS is housed in a trailer mounted environmentally controlled shelter containing the air quality monitoring equipment. Ambient air is brought into the MAQMS through an intake system designed to minimise the effects of excess moisture and sand. The system operates automatically, and data is stored within internal data loggers for a 24-hour period.

Air quality was monitored over a 24-hour period from the 25 to 29 November 2018 at four locations. The air quality monitoring conducted during the ESIA is considered sufficient and covers the project area, particularly as the revised layout has been reduced, ensuring that the collected baseline data remains representative and adequate for the required assessment. The monitoring location is detailed in (Table 5-1) and shown on (Figure 5-6) below. Sample locations were chosen based on weather conditions and the nature of the site.

Table 5-1 Air Quality Measurement Locations

Location	Coordinates	Dates
First location (NSR2) – located inside the Project site	24°22'43.25"N, 37°35'42.26"E	25–26 November 2018
Second location (NSR4) – inside the Project site	24°26'1.74"N, 37°32'33.44"E	26–27 November 2018
Third location (NSR3) – inside the Project site	24°23'46.51"N, 37°30'34.04"E	27–28 November 2018
Fourth location (NSR1) – outside Project site	24°21'14.24" N, 37°36'18'72"E	28-29 November 2018

[4] PME Environmental Standards, Ambient Air Quality
[5] PME Environmental Standards, Mobile Source Emissions

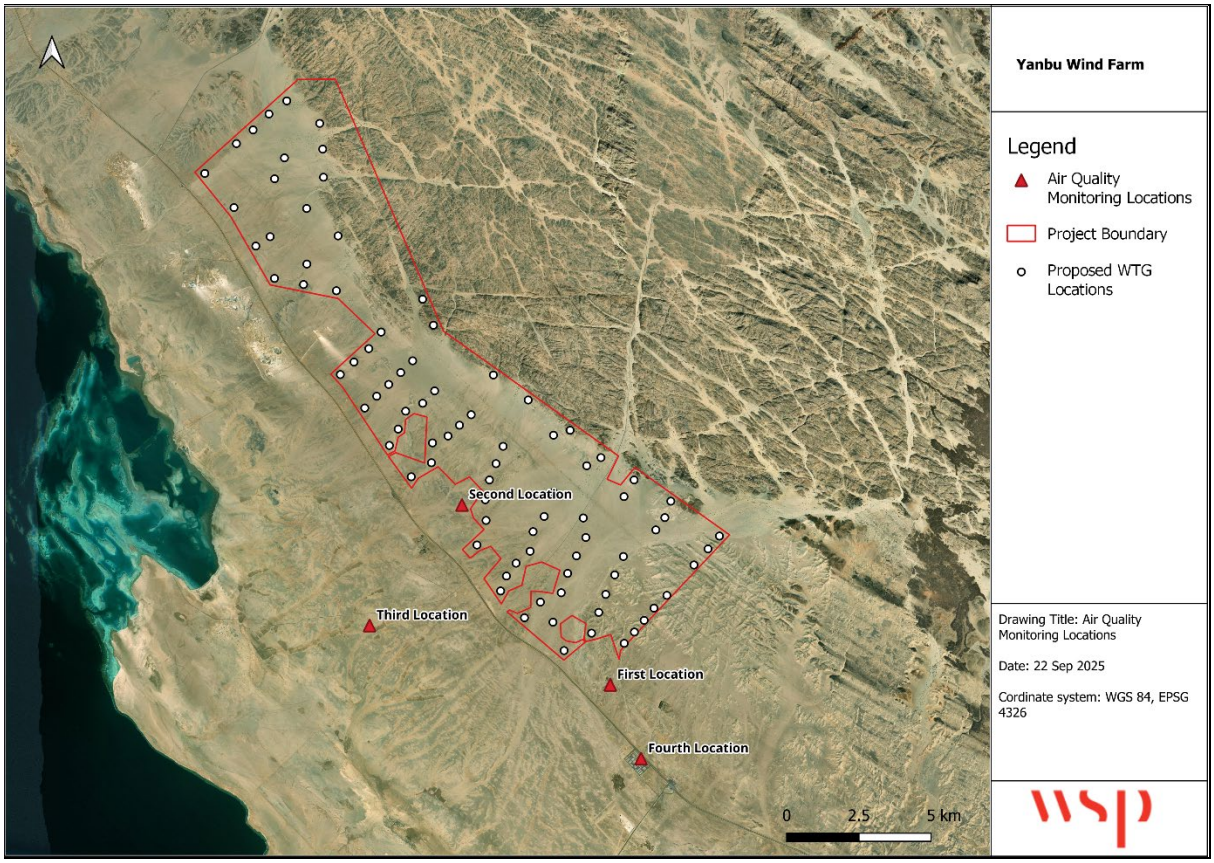

Figure 5-6 Air Quality Monitoring Locations

The analysis equipment includes a sulphur dioxide analyser, ozone analyser, carbon monoxide analyser, nitrogen analyser and particulate matter analyser. The parameters to be measured during baseline assessments are detailed in (Table 5-2) below.

Table 5-2 Ambient Air Quality Parameters

Parameter	Chemical Formula
Sulphur Dioxide	SO_2
Nitrogen Dioxide	NO_2
Ozone	O_3
Hydrogen Sulphide	H_2S
Carbon Monoxide	CO
Particulate Matter (10 µm)	PM_{10}
Particulate Matter (2.5 µm)	$PM_{2.5}$

The results of the baseline monitoring are summarised in (Table 5-3) to (Table 5-6).

Table 5-3 Location 1 Monitoring Results

Parameter	Measured Maximum Concentration	NCEC Standard
PM_{10}	23.73 µg/m³	340 µg/m³
$PM_{2.5}$	12.38 µg/m³	35 µg/m³
SO_2	0.0051 ppm	0.280 ppm
O_3	0.0171 ppm	0.120 ppm
NO_2	0.0071 ppm	0.350 ppm
CO	0.5951 ppm	32 ppm
H_2S	0.0025 ppm	0.1 ppm

Table 5-4 Location 2 Monitoring Results

Parameter	Measured Maximum Concentration	NCEC Standard
PM_{10}	27.59 µg/m³	340 µg/m³
$PM_{2.5}$	12.14 µg/m³	35 µg/m³
SO_2	0.005 ppm	0.280 ppm
O_3	0.0159 ppm	0.120 ppm
NO_2	0.0072 ppm	0.350 ppm
CO	0.4826 ppm	32 ppm
H_2S	0.0021 ppm	0.1 ppm

Table 5-5 Location 3 Monitoring Results

Parameter	Measured Maximum Concentration	NCEC Standard
PM_{10}	19.66 µg/m³	340 µg/m³
$PM_{2.5}$	16.48 µg/m³	35 µg/m³
SO_2	0.0049 ppm	0.280 ppm
O_3	0.0152 ppm	0.120 ppm
NO_2	0.0084 ppm	0.350 ppm
CO	0.2339 ppm	32 ppm
H_2S	0.0032 ppm	0.1 ppm

Table 5-6 Location 4 Monitoring Results

Parameter	Measured Maximum Concentration	NCEC Standard
PM_{10}	35.29 µg/m³	340 µg/m³
$PM_{2.5}$	24.61 µg/m³	35 µg/m³
SO_2	0.0064 ppm	0.280 ppm
O_3	0.0111 ppm	0.120 ppm
NO_2	0.0130 ppm	0.350 ppm
CO	0.2844 ppm	32 ppm
H_2S	0.0016 ppm	0.1 ppm

As shown by the results in the tables above, all measured air quality parameters are well within the NCEC standards.

5.4. NOISE

Noise and vibration were measured through 4 points within the site boundaries and the recorded results were as follows as shown in (Table 5-7) and (Figure 5-7). It is clear from the results of the measurements that all the elements comply with the permissible values in accordance with the standards of environmental protection in the general environment system and its implementing regulations.

Table 5-7 Baseline Ambient Noise level in the study area

Sr. no	Code	Latitude & latitude	L_{eq} Day Time	L_{eq} Night Time	IFC Limits		KSA Limits	
					L_{eq} Day	L_{eq} Night	L_{eq} Day	L_{eq} Night
1	First location NSR2	N 24 22 37.7, E 037 35 41.5	47.8	51.7	55	45	55	45
2	Second location NSR4	N 24 25 59.1, E 037 32 39.8	43.6	46.0	55	45	55	45
3	Third location NSR3	N 24 23 44.6, E 037 30 46.2	40.0	50.6	55	45	55	45
4	Fourth location NSR1	N 24 21 15.2, E 037 36 20.7	53.8	54.6	55	45	55	45

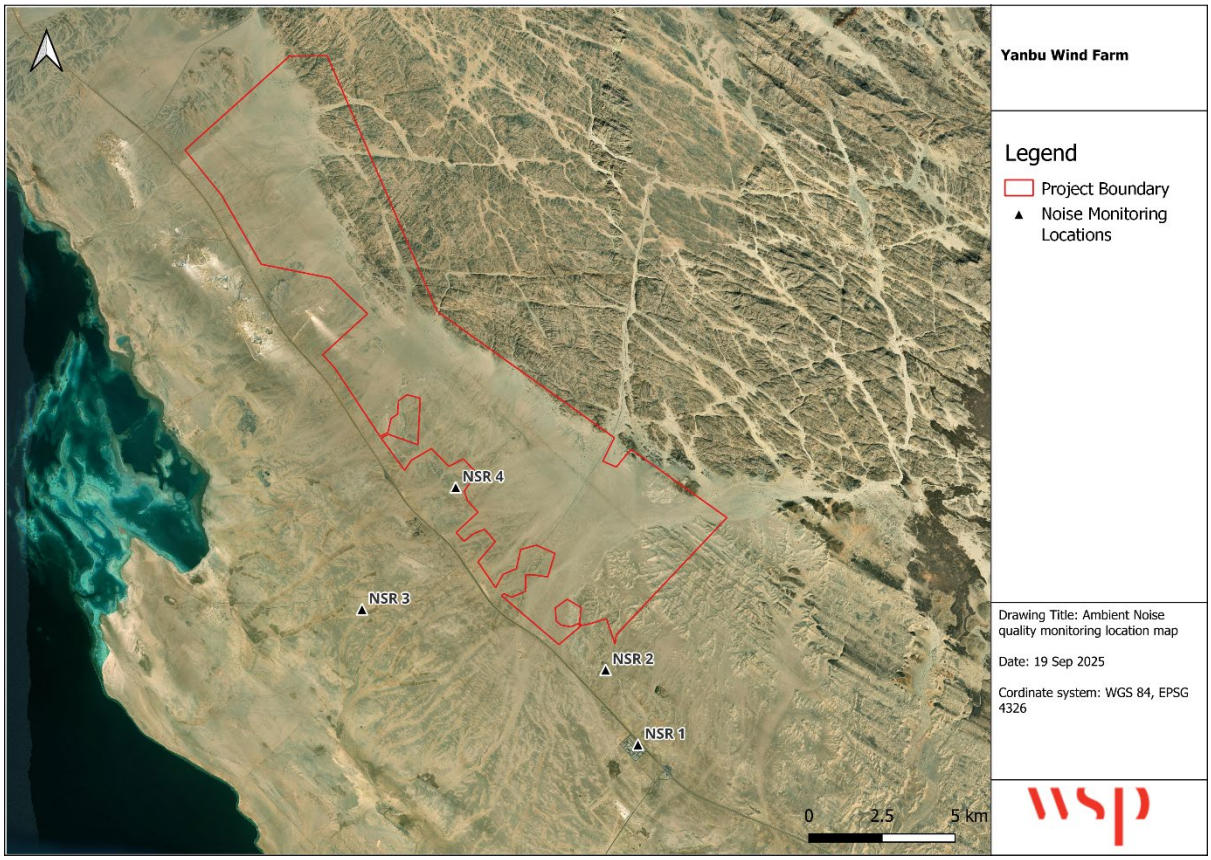

Figure 5-7 Ambient noise monitoring location map

As per the guidelines, wind farm noise at sensitive receptor locations must not exceed the following thresholds:

- 55 dB(A) Leq (1-hour) during daytime (07:00–22:00) and 45 dB(A) Leq (1-hour) during nighttime (22:00–07:00) at residential receptors or
- No more than 3 dB(A) increase above baseline ambient noise levels where background levels are below the above limits.

The Client initially provided a list of 27 sensitive receptors located around the wind farm. WSP conducted a site visit along with the Client to validate the receptors and occupancy status, wherever possible. 11 out of 27 settlements were identified as occupied by residents, while others appeared to be abandoned. The findings from the site visit informed the receptor dataset used in the modelling exercise. The sensitive receptors list and a map of the project area with the receptors is illustrated in the (Table 5-8) and (Figure 5-8) below.

Table 5-8 List of sensitive receptors

Receptors	Receptor Description	Easting	Northing
R1	Residential	356,942	2,697,785
R6	Residential	353,270	2,701,047
R7	Residential	352,384	2,701,939
R8	Residential	352,446	2,702,011
R9	Residential	352,629	2,702,069
R10	Residential (Future)	352,687	2,702,097
R11	Residential	352,250	2,703,056
R12	Residential	352,316	2,703,111

Receptors	Receptor Description	Easting	Northing
R13	Residential	352,267	2,703,112
R15	Residential	351,656	2,703,758
R27	Residential	357,871	2,704,078

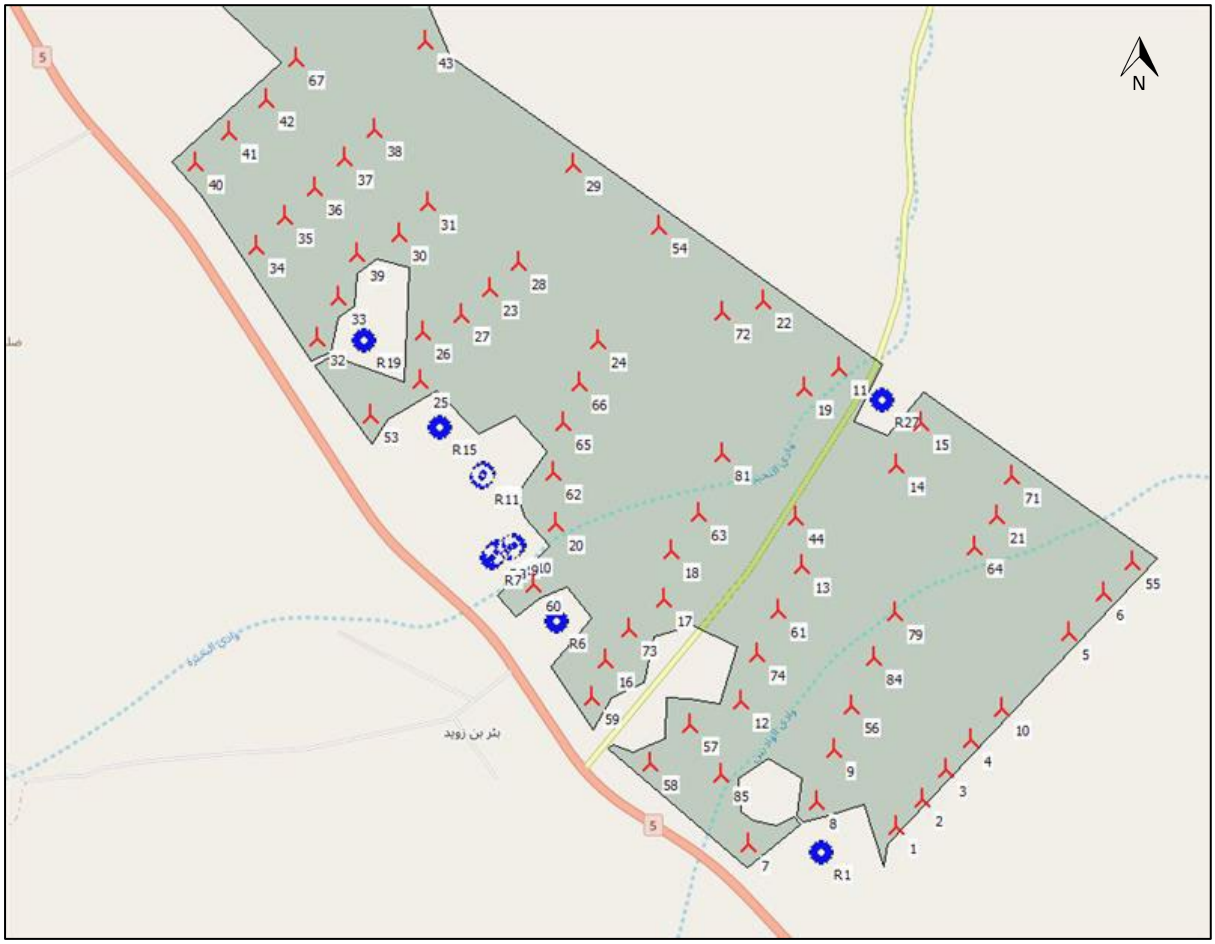

Figure 5-8 Sensitive receptors (in Blue) outside windfarm boundary

A full noise assessment has been carried out to include noise modelling at identified permanent noise sensitive receptors (NSRs). Noise levels from the development should not exceed the levels presented in the IFC EHS guidance.

The noise analysis was conducted using Decibel Module of WindPRO version 4.0 and in accordance with ISO 9613-2: Acoustics – Attenuation of Sound During Propagation Outdoors – Part 2: General Method of Calculation Model. ISO 9613-2 is an internationally recognised standard for environmental noise prediction and is widely accepted by regulators and stakeholders for use in Environmental and Social Impact Assessments (ESIAs) globally. The WindPRO software, incorporating this standard, is commonly used in the wind energy sector and is considered a best-practice tool for noise impact modelling. The operational noise modelling was conducted using an environmental noise prediction module to simulate emissions from Wind Turbine Generators (WTGs) based on the following assumptions:

- WTGs operating continuously at full capacity (100%) and at a standardized wind speed of 12 m/s at hub height
- 24-hour continuous operation, representing maximum potential noise exposure

The model evaluated noise impacts at all identified noise-sensitive receptor (NSR) locations under three different meteorological conditions:

- Scenario 1: Average meteorological conditions
- Scenario 2: Least favourable meteorological Conditions
- Scenario 3: Most favourable meteorological conditions

The assessment under average meteorological conditions was selected as it reflects typical weather patterns and provides a more realistic basis for evaluating long-term noise exposure. Under this scenario, the predicted noise levels complied with the 55 dB absolute daytime limit, and the incremental noise exposure remained within the 3 dB (A) limit at night for all sensitive receptors. Although slight daytime exceedance of the incremental 3 dB (A) threshold occurred at seven receptors. The overall impact magnitude is considered negligible.

6. GEOLOGY AND SOIL

The Arabian Peninsula is a huge crustal plate composed of ancient sedimentary and volcanic rocks, deformed, metamorphosed, and injected by plutonic intrusions. The Arabian Peninsula consists of two major regions: Arabian Shield in the west and the Arabian Platform in the east.

(Figure 5-10) shows the simplified geologic map of the Arabian Peninsula, the distribution of the main rock sequences and the main tectonic elements (Al Ajmi et.al., 2014). The approximate location of the Project is indicated on the map.

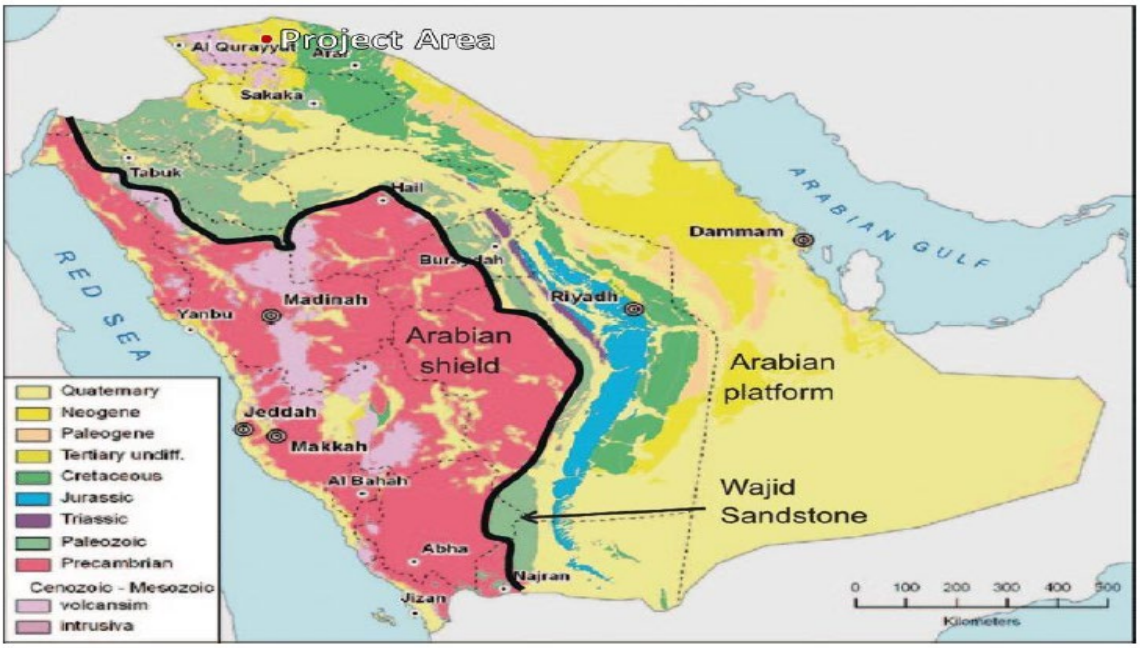

Figure 5-10 Simplified geologic map of the Arabian Peninsula

Geological conditions observed on the field and contrasted with general geologic maps. The Project site is located on a narrow quaternary fluvial plain. The north-eastern limit of the Project site corresponds roughly with an abrupt transition between the fluvial plain and the Hijaz mountains.

According to information from one borehole in proximity to the Project (Fugro - Suhaimi, 2017), the fluvial deposits are of medium dense to very dense silty sand texture and may reach depths of up to 18m.

The topography of the eastern part of the study area is mostly flat, sometimes slightly undulating, where the higher areas, consisting of elevated limestone, weathered basaltic and gypsum outcrops, form the drainage divides between the various flow routes crossing the wind farm site, which run from the hills in south-westerly direction in the direction of the Red Sea. The topsoil of the flat parts consists of mostly of a thin layer of fine

sand, in some places covered with a crust of finer material, with a darker layer of very fine to silty sand material underneath.

The flood plains of the major wadis are covered with coarse angular and rounded gravel within a matrix of fine to very fine sand and silt. The higher elevated basaltic outcrops are strewn with boulders and cobbles. In the floodplains sparse shrubs are seen. Upstream of the Project site, larger trees were observed at the foot of the Hijaz mountains along the wadis, which may be indicative of higher soil humidity.

7. HYDROLOGY AND WATER RESOURCES

The topography of the eastern part of the study area is mostly flat, sometimes slightly undulating, where the higher areas, consisting of elevated limestone, weathered basaltic and gypsum outcrops, form the drainage divides between the various flow routes crossing the wind farm site, which run from the hills in south-westerly direction in the direction of the Red Sea. The topsoil of the flat area consists largely of a thin layer of fine sand, in some places covered with a crust of finer material, with a darker layer of very fine to silty sand material underneath. The flood plains of the major wadis are covered with coarse angular and rounded gravel within a matrix of fine to very fine sand and silt. The higher elevated basaltic outcrops are strewn with boulders and cobbles. In the floodplains, sparse shrubs are seen. Upstream of the Project site, larger trees were observed at the foot of the Hijaz mountains along the wadis.

There are three groundwater wells within the project site, which are currently used by the local community for domestic and livestock watering. The project commits to maintaining these wells and will not utilize the groundwater resource, thereby ensuring the wells remain uncontaminated and fully accessible for ongoing community use. Their locations are detailed in the (Figure 7-1) below.

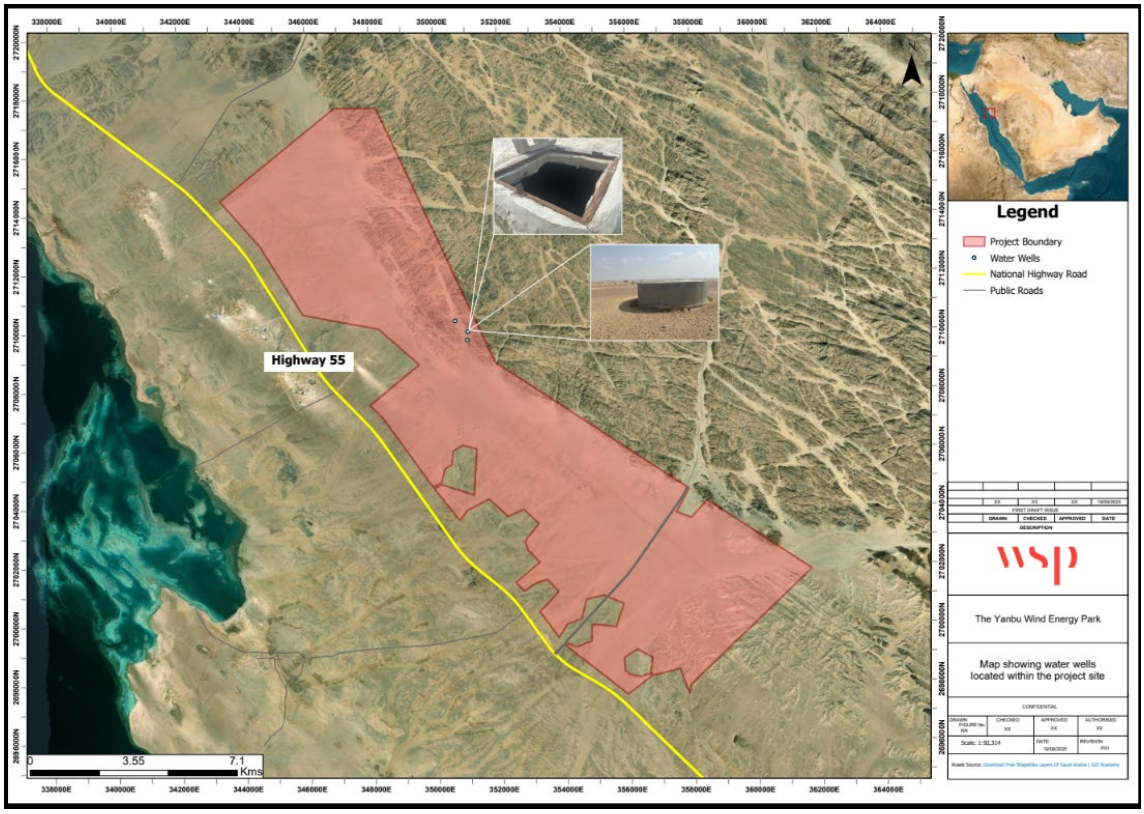

Figure 7-1 Map showing water wells within Project site

Final mitigation for both flood risk (avoidance of high-hazard areas for substations) and well protection will be finalized once the updated hydrological assessment is completed during the detailed design stage. All mitigation measures will be fully integrated into the Project's ESMP.

8. BIOLOGICAL ENVIRONMENT

The proposed Project is located within the Northern Tihamah coastal plain, a narrow, undulating strip of land situated between the Red Sea to the west and the Hijaz mountain range to the east. This coastal plain extends approximately 1,080 km, from Jeddah in the south to Haql in the north and is composed primarily of sandy and silty substrates. The elevation is generally at sea level in the southern sections, gradually rising eastward due to sediment deposition from the Hijaz Mountains.

The width of the plain varies: it is broader in the southern sector (between Jeddah and Yanbu) and narrows significantly north of Yanbu. The Northern Tihamah plains are characterized by stony and sandy soils with variable depth. Inland, the dominant vegetation type is the widely spaced Acacia tortilis–Maerua crassifolia association, typical of arid savanna ecosystems. Most areas are dry and barren during the summer months.

In spring, herbaceous flora becomes more prominent, particularly along drainage channels, alluvial plains, and silt-filled depressions near the foothills and plains around Umlaj, approximately 60 km northwest of the site. The eastern boundary of the coastal zone is often marked by salt flats or small dunes of coral sand, while in some areas north of Yanbu, the coastline is enclosed by coral rock formations and drained sand gullies.

9. SITE FLORA

The floristic survey recorded a total of 30 plant species, representing 15 families and 26 genera. All species are native to Saudi Arabia, with no confirmed endemics in the current dataset. The species assemblage reflects a typical desert and semi-desert vegetation community, adapted to arid conditions and seasonal rainfall variability.

The recorded flora is characteristic of several habitat types commonly found across western and central Saudi Arabia. These include Red Sea coastal plains, gravel plains, rocky outcrops, ephemeral wadis, interdunal depressions, and sabkha margins. The vegetation structure is predominantly herbaceous and shrubby, with scattered perennial grasses and drought-tolerant woody species.

A significant proportion of the species, approximately 70%, are known indicators of overgrazing and trampling. These include Rhazya stricta, Dipterygium glaucum, Aristida adscensionis, Senna italica, and various Fagonia and Tetraena species. Their presence and dominance in certain areas suggest long-term grazing pressure, reduced palatable vegetation, and soil compaction. In particular, Rhazya stricta is often associated with degraded rangelands and may serve as a bioindicator of habitat stress due to livestock activity.

Species such as Calotropis procera (العشار) are notable for their ecological resilience. C. procera is commonly found in disturbed soils, road verges, and abandoned agricultural plots. While not typically associated with pristine habitats, its ability to colonize degraded areas makes it an important stabilizer of loose substrates. It also contributes to pollinator support and microhabitat formation, although it is generally avoided by grazers.

The overall species composition suggests a transitional desert flora, where elements of coastal, inland, and montane desert vegetation overlap. This reflects the ecological gradients present in the region, influenced by topography, substrate type, and anthropogenic pressures. The dominance of stress-tolerant and disturbance-adapted species indicates that the surveyed areas may be experiencing moderate to high levels of ecological stress, particularly from grazing and land use change.

10. BATS

KSA is home to 30 Chiroptera species belonging to 21 genera within 9 families. (Pteropodidae, Rhinopomatidae, Rhinolophidae, Emballonuridae, Nycteridae, Hipposideridae, Miniopteridae, Molossidae, and Vespertilionidae)((Al Obaid, et al., 2023). The study by Al Obaid et al., (2018) indicated that the bat species of KS have six 96) major zoogeographical affinities; Afrotropical (eight species), Saharo-Sindian (three species), Afrotropical-Palaearctic (four species), Palaearctic (four species),

oriental (one species), and Afrotropical-oriental (two species). The project area falls within the Saharo-Arabian phytogeographical regions.

In total five species of bat were identified during the static detector surveys (Table 10-1) shows a summary of the species along with their conservation status as defined by the IUCN Red List. None of the species recorded are endemic to Arabia. (Table 10-2) shows number of passes per species per month, and (Table 10-3) shows the same results but gives species passes per sampling location.

Table 10-1 Bat Species Recorded During Surveys

Genus	Family	Scientific Name	Common Name	Arabic Name	National Status	IUCN Status	Regional Red List Status
Asellia	Hipposideridae	*Asellia tridens*	Geoffroy's Trident Leaf-nosed bat	خفاش ثلاثي الأسنان	-	Least Concern	LC
Hypsugo	Vespertilionidae	*Hypsugo bodenheimeri / Pipistrellus ariel*	Desert Pipistrelle	خفاش الصحارى	-	Data Deficient	DD
Otonycteris	Vespertilionidae	*Otonycteris hemprichii*	Desert Long-eared bat	خفاش طويل الأذنين الصحراوي	-	Least Concern	LC
Pipistrellus	Vespertilionidae	*Pipistrellus kuhlii*	Kuhl's Pipistrelle	خفاش كوهلي	-	Least Concern	LC
Rhinopoma	Rhinopomatidae	*Rhinopoma microphyllum*	Greater Mouse-tailed bat	خفاش ذيل الفأر الكبير	-	Least Concern	LC

Table 10-2 Bat Passes per Species Per Month

Scientific Name	Jan	Feb	Mar	Apr	Aug	Sep	Oct	Nov	Total
R. microphyllum	5	1	0	1185	248	0	0	0	1439
P. kuhlii	0	2	2	1	270	30	22	0	327
H. bodenheimeri	0	0	1	0	0	0	0	0	1
A. tridens	0	0	0	0	1	0	0	0	1
O. hemprichii	0	0	0	0	0	0	4	0	4
Total	5	3	3	1186	519	30	26	0	1772

Table 10-3 Bat Passes per Sampling Location

Scientific Name	VP1	VP1 Wet Flush	VP2	VP3	VP4	VP5	VP6	VP7	VP8	VP9	VP10	Total
R. microphyllum	0	1433	1	0	0	2	0	3	0	0	0	1439
P. kuhlii	0	274	1	0	1	49	0	1	1	0	0	327
H. bodenheimeri	0	0	0	0	0	1	0	0	0	0	0	1
A. tridens	0	1	0	0	0	0	0	0	0	0	0	1
O. hemprichii	0	0	0	0	0	0	0	0	0	4	0	4
Total	0	1708	2	0	1	52	0	4	1	4	0	1772

Overall, activity across the site is considered to be low with very low numbers of bats observed throughout the survey period. The highest levels of recorded passes were at the Wet Flush near VP1 however analysis of recordings suggest that this reflects low numbers of bats foraging throughout the night rather than multiple individuals moving through the area.

The species recorded in most months was Kuhl's Pipistrelle, with registrations from six of the eight months surveyed. The most activity of this species was recorded in August with a total of 270 passes, and most of these were from the Wet Flush area.

An investigation on bat species' global vulnerability to collision and mortality at wind energy parks revealed an association between some traits and higher collision rates. Species dispersing furthest had significantly greater collision rates than sedentary species, but roost site and hibernation were not significant predictors. Dispersal distance was defined as follows:

- Sedentary: less than 10 kmRegional: 10-100 kmLong distance: 100+ km (equating to migration)

The investigation also found that tree-roosting species had significantly higher collision rates than other species (Thaxter et al., 2017). Most species identified above are known to roost in caves, old buildings, crevices, wells, and such.

11. BIRDS

Desk-based studies, consultation and field surveys were undertaken as part of the assessment of potential impacts on terrestrial ecology and bird species. Impacts on designated sites, habitats and fauna (herpetofauna, terrestrial mammals, bats and invertebrates) have been assessed. There are no national or international legally protected areas, with regards to the biological environment, within or immediately adjacent to the proposed Project footprint and there areno UNESCO-designated biodiversity sites within 50km. The Red Sea and Al-Wajh Bank Important Bird Areas (IBA) and associated coastal habitats are present within the vicinity of the site and are located approximately 5km to the south and west of the site at their closest points. The Madinat Yanbu al-Sinaiyah IBA is located 65km to the south-east of the site on the shoreline of Yanbu Industrial City, and Hima al-Fiqrah is also present approximately 111km to the east. The Project site has been chosen to avoid the areas of highest ecological sensitivity. The habitats recorded on site are not considered to be important or of conservation concern. They are common in the region and are heavily impacted by humans and human activity. The scale of the proposed site is very large, but due to the proposed layout of the Project there are large migratory corridors that will be avoided.

It is anticipated that during construction, there would be some loss of invertebrates, herpetofauna (i.e. reptiles) and small rodents. It is unlikely that losses would adversely affect the wider populations or the food resource for predators. Despite this, measures will be put into place to limit the impact of construction. Hence, impact on the terrestrial habitats and faunal species during construction is assessed as not significant.

Potential impacts during operation of the Project may arises because of disturbance of fauna from WTG noise, shadow flicker, people (e.g. site workers, vehicle movement), and traffic and loss of fauna from collision with WTGs (bats). No significant impacts are anticipated.

With regards to ornithology, it is considered that there will be no direct impacts on the Important Bird Area (IBA) or the species it supports during any stage of the works. However, the Project lies near the Red Sea Flyway, a major migratory route used by large numbers of birds, particularly during spring and autumn migrations. Potential impacts include habitat loss, possible nest destruction for passerine (i.e. small perching birds such as sparrows and warblers) and ground nesting bird species as well as disturbance impacts and collision with WTGs during operation.

It is noted that six species of conservation concern were recorded flying through the site and by employing a precautionary approach to the data gathered that additional operations mitigation and monitoring will need to be implemented. This would include three years of monitoring and mitigation, after each year of which the mitigation package will be reviewed using the pre-construction and operational survey data. During this period monitoring will be year-round however full site presence will be limited to the spring and autumn migration seasons. It is considered likely that the careful site selection of the WTGs (avoidance and reduction of impacts) along with standard mitigation and monitoring measures will result in residual impacts that will be considered as being not significant.

12. ARCHAEOLOGICAL AND CULTURAL ENVIRONMENT

The closest World Heritage Site (WHS) and important archaeology sites are considered to be sufficiently distant about 250 km from the Project site to avoid any significant direct or indirect impacts.

As no international or nationally recognised cultural heritage features have been identified within the Project site or in the surrounding area, the Project is deemed not to have any direct or indirect adverse impacts on such features during construction, operation or decommissioning.

There is however the potential for the discovery of unrecorded buried archaeological remains during the construction phase as the Project, which will involve ground clearance activities such as levelling, grading and excavation works. These works have the potential to directly impact on unrecorded buried archaeological remains which may be present within the site boundary and may be of archaeological importance.

With mitigation, it can be concluded that there would be no significant impacts associated with cultural heritage as a result of the construction of the Project. Mitigation will include the implementation of an archaeological chance finds procedure during initial construction works, supported by toolbox talks to raise worker awareness. This will ensure any unexpected discoveries are properly recorded and reported to the relevant authorities before any further disturbance occurs.

13. RESIDENTIAL AREAS

It is noted that the Project site is located 50km northwest of Yanbu, which is the second largest city in the KSA by the Red Sea after Jeddah. The nearest settlement to the Project is Al Nabah which consists of a small residential area located 4.4 km to the south of the site boundary. Furthermore, the Yanbu Cement Company, including a residential area, is located 12.5 km to the south-east of the Project boundary and it's unlikely that workers will come into direct contact with the Yanbu Cement Company residential area. Given the remote location and sparse population, potential impacts on local communities are expected to be low. The construction workforce is likely to be housed in a dedicated labour camp near the site, minimizing daily interaction with surrounding settlements. Al Nabah is the most proximate community and may experience minor indirect effects, such as increased traffic or demand for local services, but no significant disruption is anticipated. The influx of workers is rated as having a medium sensitivity due to presence of local communities near the site. As a result, the overall impact is considered minor and temporary.

For this assessment in (Figure 13-1), 27 receptor locations were considered. As per the site assessment, 11 are categorised as sensitive due to observed residential occupancy. The remaining 16 were deemed non-sensitive, as they consisted of abandoned structures or livestock camps.

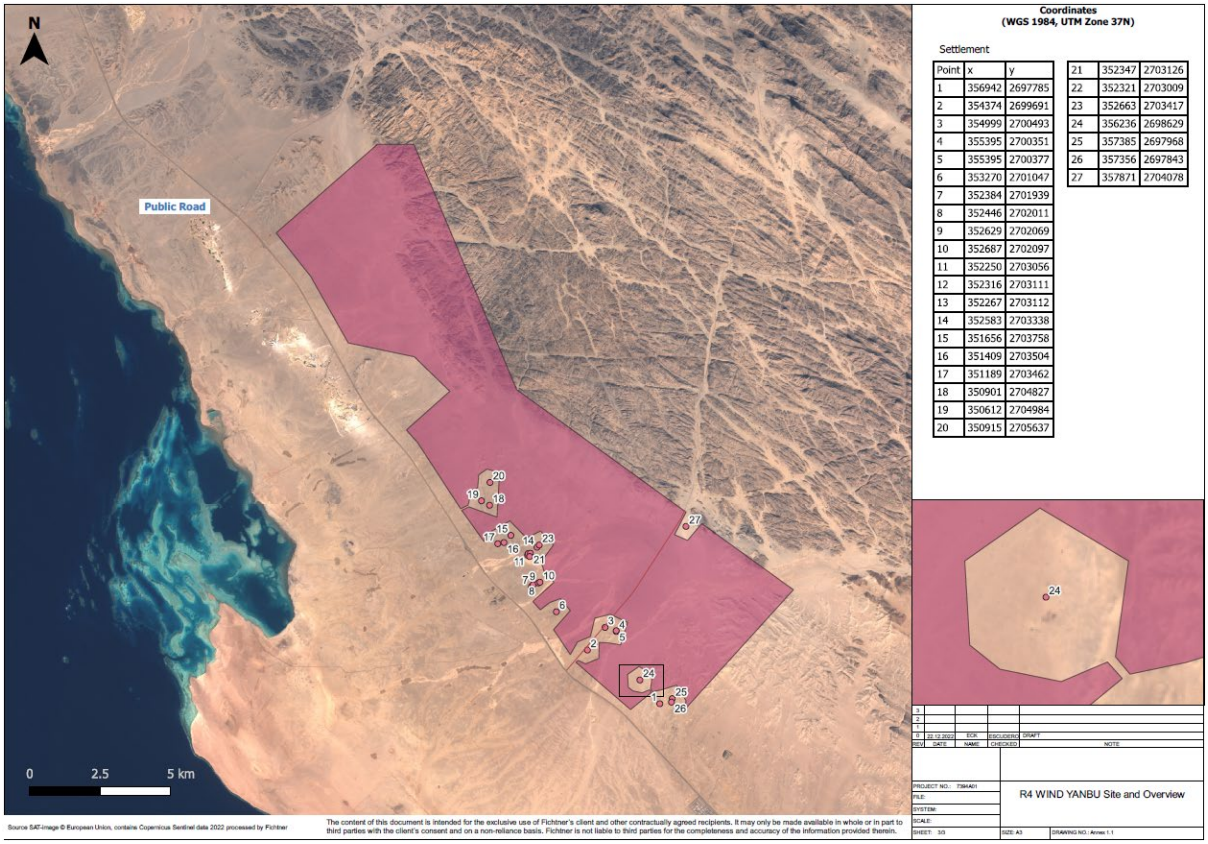

Figure 13-1 Assessment of (27) settlements outside the site boundaries

14. MITIGATION OF IMPACTS DURING CONSTRUCTION

During construction, the contractor should ensure that no encroachment to the nearby land should occur and should follow the clearly defined transportation routes. Transport routes will be identified, and training will emphasize that employees should keep to the designated routes in order to protect the environment and reduce encroachment on adjacent land, reduce dust fall across the site due to the movement of trucks on undesignated sand tracks and also protect the visual aesthetics of the landscape. Construction activities should be limited to demarcated areas.

Quantitative noise assessment should be carried out to verify compliance with standards during construction. Based on the current baseline conditions at the Project site, and distance to identified permanent receptors, there are not considered to be any adverse impacts from noise during construction..

Given the absence of sensitive receptors close to the site, a dust control plan and dust monitoring are not considered necessary; however, typical dust control measures are recommended to be implemented throughout the construction phase. Especially since construction will last for a long period, the site is recommended to be fenced with barriers at least as high as any uncovered stockpiles, to minimise dust mobilisation away from the site when dust generating construction activities are carried out in dry and windy conditions.

Construction and decommissioning traffic will be managed as per the requirements of IFC EHS Standard 3.0: Community Health and Safety and IFC EHS Standard 4.0: Construction and Decommissioning. This will minimize the potential for impacts to occur because of the park. This includes the development of a logistics, traffic and transportation plan which will cover the transportation of oversized and heavy turbine components using specialist transportation vehicles. The management of the transportation of turbines will be carried out in compliance with the relevant permitting requirements of the Ministry of Transport.

Occupational health and safety hazards during the construction, operation, and decommissioning of wind energy facilities are generally similar to those of most large industrial facilities and infrastructure projects. The project will follow the IFC EHS Guidelines for Wind Energy (2015) to ensure the health.

15. MITIGATION OF IMPACTS DURING OPERATION

Standard mitigation measures to reduce landscape and visual impacts would be adopted in order to minimize impacts on landscape and visual receptors. These would include all of the turbines having the same rotor diameter and hub height and turning in the same direction at broadly the same speed. Tubular steel towers reduce visual clutter and are preferred to lattice or pylon-like generator towers. Turbine transformers, in line with larger turbine designs, would normally be mounted within the machines to reduce visual clutter. If the transformers are external to the turbines, then an appropriate colour which diminishes their visual impact should be adopted in relation to the characteristics of the site and surrounding landscape. The turbines would all be a similar colour and finish so as to promote visual integration.

Wind turbines will be subject to continuous monitoring and regular maintenance such that the likelihood of blade throw is unlikely and rare.

It is necessary to consult with stakeholders, owners and operators of communication towers to determine if possibly some local adjustment of a number of turbines within the wind farm area would be required.

Further bird surveys should be based on the existing study outlined in this report and should include, as a minimum, IFC & international best practice compliant surveys prior to construction.

16. STAKEHOLDER ENGAGEMENT ACTION PLAN

This plan will provide all identified stakeholder groups and interested factions with a channel of communications between the stakeholder groups and the Project developer. The approach generally uses the different levels of engagement to provide more focused activities based on the level of significance of each stakeholder groups. For example, a Standard level of engagement can be achieved using disclosure, while a Moderate level can be achieved via consultation and engagement, and focused engagement can achieve a high level of engagement. The action plan included various engagement methods for the different proposed activities. The action plan also details some proposed grievance mechanisms for the project developer in order to monitor grievances and identify any recurrent issues, or escalating conflicts. Including but not limited to the following:

- Implementing a grievance mechanism and ensure the responsiveness of this mechanisms to concerns and complaints
- Receiving and logging all comments and complaints associated with the project
- Responding to such complaints and comments wither verbally or in writing

Lastly, the report emphasizes the importance of monitoring stakeholder engagement activities in order to ensure that the consultation and disclosure efforts are sufficient and effective throughout the process.

17. PUBLIC CONSULTATION

During the preparation of the regulatory ESIA, Wood, in coordination with SPPC, held a stakeholder meeting on October 31, 2018, in Riyadh to discuss the Wind Energy Park and address any concerns or issues. The meeting was attended by representatives from different stakeholders including but not limited to:

- National Centre for Environmental Compliance (NCEC)
- National Centre for Wildlife (NCW)

- Ministry of Environment, Water and Agriculture (MEWA)
- Ministry of Tourism
- The Public Authority for Transport
- Ministry of Transport and Logistic Services
- Ministry of Municipal, Rural Affairs and Housing
- Saudi Railway Company
- Ministry of Defence
- Communications and Information Technology Commission (CITC)
- The Saudi Authority for Industrial Cities and Technology Zones (MODON)
- General Authority of Civil Aviation (GACA)
- Heritage Commission
- Saudi Ports Authority

During the session, the different Project aspects were discussed including but not limited to components as well as the potential positive and negative impacts of the Project. Attendees were supportive of the concept of the renewable energy program and the development of the proposed Project.

18. SUMMARY OF THE ENVIRONMENTAL, SOCIAL AND ECONOMIC LOSSES AND GAINS THAT JUSTIFY THE ESTABLISHMENT OF THE PROPOSED PROJECT

Overall, the Project is considered to have a relatively low impact on the environment project provided that the CSMP is implemented correctly. All mitigation and monitoring measures will be managed through CSMP which will be further developed in line with regulatory and lender requirements during construction phase. Ultimately, the introduction of the Project will facilitate the diversification of energy supply in KSA and will improve the country's sustainability targets, aiding with the reduction of GHG emissions, and aiding with meeting Saudi Arabia's 2030 renewable energy target, equivalent to 58.7 GW of electricity from renewable sources by 2030. Thus, resulting in an overall positive impact on the environment and a lessening of KSA's dependence on non-renewable energy sources.